

**IN THE MATTER OF**

The Resource Management Act 1991

**AND**

**IN THE MATTER OF**

Notices of requirement for designations under section 168 of the Act, in relation to Te Ahu a Turanga; Manawatū Tararua Highway Project

**BY**

**NEW ZEALAND TRANSPORT AGENCY**

Requiring Authority

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**STATEMENT OF EVIDENCE OF BOYDEN HENRY EVANS  
(LANDSCAPE, NATURAL CHARACTER AND VISUAL EFFECTS)  
ON BEHALF OF THE NEW ZEALAND TRANSPORT AGENCY**

**8 March 2019**

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**BUDDLEFINDLAY**

Barristers and Solicitors  
Wellington

Solicitors Acting: **David Randal / Thaddeus Ryan / Frances Wedde**

Email: david.randal@buddlefindlay.com

Tel 64-4-499 4242 Fax 64-4-499 4141 PO Box 2694 DX SP20201 Wellington 6140

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## INTRODUCTION

1. My name is **Boyden Henry Evans**.
2. I am a NZILA<sup>1</sup> Registered Landscape Architect and a Partner at Boffa Miskell Limited ("**Boffa Miskell**"), a New Zealand-owned environmental planning and design consultancy.
3. I prepared Technical Assessment #4: Landscape, Natural Character and Visual Effects ("**Technical Assessment 4**") as part of Volume 3 of the Assessment of Environmental Effects ("**AEE**"), which accompanied the Notices of Requirement ("**NoRs**") lodged on 2 November 2018 in respect of Te Ahu a Turanga; Manawatū Tararua Highway Project ("**the Project**").
4. My qualifications and experience are set out in paragraphs 4 to 7 of Technical Assessment 4.
5. In preparing Technical Assessment 4 and my evidence, I have:
  - (a) Undertaken several site visits, initially in 2017 during my involvement as part of the team carrying out the route options assessment and multi-criteria analysis, and then subsequently when carrying out the landscape, natural character and visual assessments of the Project to support the AEE for the NoRs.
  - (b) Undertaken during the NoR investigations five site visits between July and October 2018 where I considered the Project at a broad, landscape scale and at a detailed level, particularly in those parts of the route where the landscape, natural character and visual amenity aspects required close scrutiny. Two of these site visits were in the company of other Project team members (e.g. terrestrial ecologist, freshwater ecologist).
  - (c) In January and February 2019, traversed the Manawatū Gorge Walking Track from the western and eastern ends to assess the level of visibility and visual effects of the Project from this location. There are several lookout points along the track with views across the Gorge towards the Project. I assessed views from the White

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<sup>1</sup> New Zealand Institute of Landscape Architects.

Horse Rapids Lookout but the track to the Big Slip Lookout was closed because of health and safety reasons.

- (d) Attended a team briefing meeting in June, two design workshops (July and August), two mitigation workshops (July and August) and a pre-lodgement workshop (October). The workshops involved representatives from the three relevant territorial authorities (being Palmerston North City Council, Tararua District Council, and Manawatū District Council) and experts engaged on their behalf, Horizons Regional Council, and iwi. At the mitigation workshops and the pre-lodgement workshop I presented on the landscape-related investigations being and the preliminary findings. I also had discussions with Tararua District Council and their landscape expert in relation to the Manawatū Gorge Outstanding Natural Landscape and the Pohangina Valley Outstanding Natural Landscape (“**ONL**”).
- (e) I was also involved in two workshops (August) with the other team members undertaking the natural character assessment. The first of these focused on discussing the assessment methodology and the second to review and finalise the assessment findings.
- (f) Reviewed the technical assessments completed by other experts and submitted as part of the AEE for the NoRs.

### **Code of Conduct**

- 6. I confirm that I have read the Code of Conduct for expert witnesses contained in the Environment Court Practice Note 2014. My evidence has been prepared in compliance with that Code, as if it were evidence being given in Environment Court proceedings. Unless I state otherwise, this evidence is within my area of expertise and I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.
- 7. Any assumptions and exclusions applied in my assessment are set out in paragraphs 12 to 14 of Technical Assessment 4. In particular, I note that my assessment considers the upper/outer limit of (or realistic 'worst case') actual and potential effects on the environment of the Project, based on the location and the extent of the proposed designation, potential options to

design a road within that designation, and proposed measures to avoid, remedy, mitigate or offset adverse effects (where it is appropriate to do so).

### **Purpose and scope of evidence**

8. Technical Assessment 4 assesses the landscape, natural character, and visual effects the Project is likely to have. It makes recommendations to avoid or mitigate these potential effects, including through the establishment of appropriate conditions.
9. My evidence does not repeat the detail set out in that assessment, but rather in this evidence I:
  - (a) present the key findings of Technical Assessment 4, updated to take into account information received more recently, in an executive summary;
  - (b) comment on submissions received in respect of the NoRs;
  - (c) responded to questions raised by the Hearing Panel; and
  - (d) comment on the Councils' section 42A reports.

### **EXECUTIVE SUMMARY**

#### **Summary of the Project's landscape, natural character and visual effects**

10. As with any major infrastructure development of this kind, the Project will have adverse effects on biophysical aspects, landscape character and the natural character of rivers, streams and their margins. The Project will also give rise to adverse visual effects; for the most part these can readily be mitigated.
11. An integral part of the development of the Project has been the consideration of the designation corridor and potential alignment options by the consultant team to avoid or minimise adverse effects. As a result of this process, potential adverse landscape, natural character and visual effects have been reduced or minimised in several places.
12. The western end of the Project poses the greatest challenges in terms of landscape, natural character and visual effects. This involves a new bridge over the Manawatū River, within the Manawatū Gorge ONL, and then the corridor traverses an area of sensitive landscape comprising valued

streams and indigenous vegetation, including two remnant forest areas protected by Queen Elizabeth II National Trust ("**QEII**") open space covenants. The Project also traverses the ridgeline of the Ruahine Range, which is identified as an ONL. In addition, the proposed construction access off Saddle Road, which is aligned along an existing access track, will traverse the southern end of the Pohangina Valley ONL.

13. The avoidance of important areas of indigenous vegetation, reduction of effects on waterways, attention to the detailed design of the alignment, and constraints on construction methods will assist in reducing the level of adverse effects. These aspects, together with various mitigation measures, including the ecological offsetting as described by **Dr Forbes** (Technical Assessment 6) and in the Cultural and Environmental Design Framework ("**Design Framework**"), will also contribute to reducing adverse effects.<sup>2</sup>
14. A summary of the Project's landscape, natural character and visual effects is set out below.

### **Landscape effects**

15. The landscape effects of the Project vary from low in some sectors to high in others. The areas where there are high adverse effects are where there are potential large-scale biophysical changes because of earthworks, together with removal of areas of high-value indigenous vegetation, which in several places is protected by QEII open space covenants. The designation corridor also traverses three ONLs (as noted above, the Manawatū Gorge, Pohangina Valley and the Ruahine Ridgeline). Proposed condition 5(e)(ii) will limit the extent of clearance of the highest-value vegetation types; nonetheless, in several places where these high adverse biophysical changes occur, there will also be high adverse effects on landscape character.
16. Embankments formed to support the road and large cuts to existing landform will alter the existing topography and require vegetation removal and, in places, diversion of sections of existing streams. Design guidance in the Design Framework will reduce these effects; using bridges instead of embankments or culverts and minimising the Project footprint, for example, are measures that will mitigate adverse effects (Design Framework 3.2).

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<sup>2</sup> The Project Conditions describe the 'effects envelopes' and ecological offsetting measures.

17. Revegetation of areas of indigenous vegetation affected by being fragmented by the Project and creating buffers of new planting to seal and protect the edges of native forest remnants, are mitigation measures that are integral in the Project's detailed design (Design Framework section 2.2.3).
18. In places outside the Te Āpiti Wind Farm, revegetation to connect isolated forest remnants affected by the Project (3.5 Design Framework) and connecting these along gullies with the forest in the adjoining Manawatū Gorge Scenic Reserve is another positive offsetting/mitigation measure proposed. The proposed designation condition 11 details the requirements of the design framework.
19. The Project involves construction of a rural highway through a working rural landscape, which has been altered previously by the construction of the Te Āpiti Wind Farm. Both the wind turbines and the construction of the network of access tracks between the turbines significantly changed the original rural character and added new man-made elements. The Project will add a series of new elements, together with new activity. Saddle Road, situated immediately to the north of the Project, also crosses the Ruahine Ridgeline ONL.
20. While there will be adverse landscape and natural character effects, these are focused at the western part of the Project, where the existing landscape values and levels of natural character are higher than the rest of the designation corridor. Where adverse biophysical and landscape character effects do occur, the conditions, together with measures described in the Design Framework, will provide effective mitigation once fully implemented through the detailed design and construction phases.
21. The table below summarises the potential biophysical and landscape character effects of the Project in relation to each of the sectors identified (based on a 'worst case' scenario as outlined in paragraph 7 above). Conditions 10, 11, 12 and 13 outline the proposed mitigation measures.

**Table 4.1: Summary of landscape effects<sup>3</sup>**

<b>Sector</b>	<b>Biophysical Effects</b>	<b>Landscape Character Effects</b>
1: Bridge to Bridge	Low	Moderate Low
2: New Manawatū River/Gorge Bridge	Moderate	High
3: Western Slope	Moderate High	High
4: Te Āpiti Wind Farm and Ridge	Moderate	Moderate High
5: Eastern Slope	Moderate High	High
6: Woodville Gateway	Moderate Low	Moderate

### **Natural character**

22. Natural character is about condition. It is a term used to describe the naturalness (lack of modification) of coastal, river/stream and wetland environments and their margins. In the context of the Project, a lack of, or lower level of modification, would equate to a higher level of natural character.
23. Assessment of natural character is not the domain of any one expert but instead involves inputs from several disciplines (i.e. freshwater and terrestrial ecology, stream morphology, water quality, landscape context and experiential aspects). For this reason, the natural character assessment of the waterways was carried out by a team of experts, who individually assessed attributes and then worked together to assign an existing level of natural character, and then determined a post-development level of natural character.

#### *Existing levels of natural character*

24. The assessment of existing levels of natural character of the rivers and streams was undertaken at two scales; a broad-scale 'whole river or stream' assessment, and at a more detailed level focusing on specific areas where the Project crosses waterbodies. A region-wide natural character assessment of rivers, streams and wetlands has not yet been carried out by

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<sup>3</sup> Based on a 7-point scale.

Horizons, nor by the territorial authorities, so the broad-scale assessment is intended to provide a contextual baseline.

25. There were no areas of outstanding natural character identified at either scale (refer section 4.1, Appendix 4.A to Technical Assessment 4).
26. The Manawatū River through the Gorge was identified as having a high level of natural character at the broadscale (with a moderate-high level at the proposed crossing point).
27. Three of the streams crossed by the Project also have a high level of natural character as outlined in Appendix 4.A to Technical Assessment 4, at the following locations:
  - (a) stream referred to as the 'western QEII stream', (Stem 7A)<sup>4</sup> which flows from a QEII covenant down to an area of old growth alluvial forest (chainage 4000-6000);
  - (b) stream referred to as 'eastern QEII stream' (Stems 6A, 6B, 6C)<sup>5</sup> (chainage 6100-6500); and
  - (c) stream crossed by an existing construction access track from/to Saddle Road.

#### *Effects on natural character*

28. My assessment has considered the long-term (permanent) effects of the Project based on the indicative alignment. A detailed analysis of the Project's short and long-term effects on natural character of watercourses and their margins will be undertaken during the development of detailed design in the context of the regional resource consenting phase.
29. The change to the level of natural character was considered at a site level (crossing point locality) and at a whole stream level for the streams, and at the local reach level for the Manawatū River (i.e. the Gorge). This was an important consideration in the assessment process because it acknowledges the interconnectedness of a stream or waterway.
30. Based on the methodology, 10 attributes were considered in the assessment of the existing level of natural character, and the Project's

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<sup>4</sup> Drawing C-10, and referenced in Condition 5e

<sup>5</sup> Drawing C-10, and referenced in Condition 5e

effects on the level of natural character. Of these, the Project most impacted on the morphology of the active bed and margins, the aquatic taxa and ecosystem functioning of the active bed, the terrestrial ecology of the margins, and the experiential qualities. The flow regime, water quality, and absence/presence of exotic flora and fauna were not generally considered to be significantly affected over the long-term.

31. The greatest impact of the Project relates to the scale and location of the works footprint in the active bed and margins of the streams. At the local scale, the filling of the stream gullies with earth embankments results in permanent loss of vegetation and the loss or modification of significant lengths of active bed and margin in what are relatively small catchments. At the broader scale, the Project results in fragmentation of ecological communities, and disruption of ecosystem functioning along the streams.
32. Experientially, it is inevitable that the introduction of large-scale earthworks and road activity will dominate the natural environment and tranquil aspects of the small stream gullies, and within the Manawatū River corridor where the proposed new bridge will cross.
33. The areas of greatest sensitivity in terms of potential effects on natural character are those in locations where the existing natural character is highest. Three of the streams crossed by the Project have high natural character.
34. A reduction in the overall level of natural character from High to Moderate (or less) is considered to constitute a significant reduction in the level of natural character.<sup>6</sup> Waterbodies with high natural character are more sensitive to change, which could adversely impact on the attributes and qualities than those that have a moderate or low level of natural character. Any reduction in the overall level of natural character would require several of the 10 assessment attributes to be reduced.
35. My assessment determined that the existing high natural character of parts of two streams (QEII West (chainage 4000-6000) and QEII East (chainage 6100-6400)) may be significantly reduced by the Project. In both situations, the footprint of the alignment and construction works could cause

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<sup>6</sup> Horizons One Plan Objective 6-2(b)(ii) provides the following direction: “Adverse effects, including cumulative adverse effects are: (ii) avoided where they would significantly diminish the attributes and qualities of areas that have high natural character, and...”

permanent loss to relatively large sections of the active bed and stream margins, in what are relatively small gullies and catchments.

36. Table 4.2 sets out a summary of effects on natural character at the site-specific scale.

**Table 4.2: Summary of changes to natural character (at crossing locations)**

<b>Location</b>	<b>Current Condition</b>	<b>Post-Construction Condition</b>
Manawatū River Crossing	Moderate/High	Moderate
Chainage 4000-6000 Lower stream/Wetland QE II West	High High	Moderate/High Moderate
QEII East (chainage 6100-6400)	High	Moderate
East End Stream (chainage 12700-13100)	Moderate	Moderate/Low
Stream crossed by an existing construction access track to/from Saddle Road	High	Moderate/High

37. Table 4.2 sets out the levels of natural character at a site-specific scale. However, when considered at an overall stream scale, the change in level of natural character is diminished. As shown in Table 4.3 below, for the QE West stream, the natural character at an overall stream scale would change from High to Moderate/High. For the QEII East stream and the stream crossed by an existing construction access track to/from Saddle Road, the natural character would remain High given that the crossing point is in an open and grazed section of the stream and a culvert could be installed with minimal disturbance and the attributes and qualities would remain relatively intact.

**Table 4.3: Summary of changes to natural character (at whole stream level)**

Location	Current Condition	Post-Construction Condition
Chainage 4000-6000 QE II West and lower stream/wetland	High	Moderate/High
QEII East (chainage 6100-6400)	High	High
Stream crossed by an existing construction access track to/from Saddle Road	High	High

38. While the natural character of these stream/river crossings would be diminished by the Project, the proposed mitigation, supported by proposed conditions 11 (Design Framework), 12 (Landscape Management Plan) and 17 (Ecological Management Plan) will direct the detailed design process to minimise the level of effects on natural character.
39. In addition, proposed condition 5(e) requires the outline plan/s to demonstrate that certain minimum standards are achieved, including:
- (a) The QEII Trust west and east streams must not be disturbed in exceedance of a specified length; and
  - (b) The area of indigenous vegetation removal must not exceed the area specified for each type of ecosystem.
40. These measures will mitigate adverse effects on natural character.
41. In addition, design guidelines in the Design Framework, to be implemented during detailed design phase, will also assist to minimise adverse effects on natural character of streams.<sup>7</sup>

### **Visual effects**

42. The focus of the visual effects assessment is on the Project's visual effects on the receiving environment, given that it would be a new element and activity. The visual effects for road users has also been a consideration,

<sup>7</sup> For example, refining the highway alignment to minimise impact on the natural character of streams and riparian vegetation, protection and revegetation of areas in the QEII open space covenants above the road alignment, use of bridges instead of culverts across streams,

and the design principles and design outcomes covered in the Design Framework describes these. These include creating memorable experiences for users through maintaining views for drivers descending the Ruahine Range, maintaining views of landscape features such as the Manawatū Gorge Scenic Reserve and the Te Āpiti Wind Farm, provision of lookout points and safe stopping places, integrating batter slopes with the adjacent landform, provision of ecological and amenity planting, and design of structures such as bridges to enhance the experience of road users and not compete or detract from the landscape. Including these matters in the Design Framework will ensure that views from the road will be considered as part of confirming the road alignment and preparing outline plans.

43. The potential viewing audiences of the Project are limited because of the Project's distance from both Ashhurst and Woodville, the two areas of concentrated residential settlement, and screening effects of both topography and vegetation. Overall, adverse visual effects can readily be mitigated from these two primary viewing audiences through the provisions set out in sections 2 and 3 of the Design Framework.<sup>8</sup>
44. The only area where there will be a high level of visual effects is in the environs of the new bridge across the Manawatū River. The proposed bridge is in an area that receives a high number of visitors annually (spread throughout the year), who come to enjoy the Manawatū Gorge Scenic Reserve, the Gorge landscape, and the track network that traverses the 600ha of indigenous forest. On the southern side of the River, the bridge would cross over the Department of Conservation ("**DOC**") carpark and the Te Āpiti Manawatū Gorge information shelter. The bridge would be a prominent visual element and affect the landscape character of this area. The scale of the bridge and its contrast with the largely natural setting would dominate this area of the Manawatū River environment. However, the design of the bridge, treatment of earthworks, and mitigation planting will help to integrate the bridge in its landscape setting.
45. The potential adverse effects of the Project on the recreational and landscape value of the carpark and information shelter was considered during the team workshop sessions, and the designation was extended

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<sup>8</sup> Landscape and amenity planting at strategic locations, planting indigenous vegetation along the fragmented by the corridor; areas of secondary broadleaf vegetation; design of batter slopes and spoil disposal areas to integrate with adjoining natural landforms.

westwards along the river terrace as a result. This was done to ensure that a carpark can be developed that can accommodate the growth of visitor numbers to the reserve, together with visitor facilities at the entrance to this regionally important scenic reserve.

46. Potential views from Ashhurst and Woodville (and their outskirts), State highways, roads and other public locations, such as the Te Āpiti Wind Farm lookout, were considered and assessed, and visualisations were produced from several key viewpoints to illustrate the designation in its landscape context. The indicative road alignment with the areas of cut have been modelled in the visualisations.
47. I also assessed whether there would be views of the Project from the Manawatū Gorge Walking Track. In January/February 2019 I walked most the length of the track, first from the western end and then on a second visit from the eastern end. While the track is within tall dense forest, there are identified lookout points along the track with views across the Gorge and in a few places brief glimpses through the trees. The visual effects of the Project on views from the walking track are very low. Having walked 7.5km of the 10.5km Gorge track and determined that the visual effects are very low, I did not prepare visual simulations from any of the identified lookout points.
48. The distance of the Project from most of the visual simulation viewpoints, together with the undulating and broken topography in which it will sit, restricts the level of visibility of the Project. Therefore, the Project will have low or moderate visual effects from all the selected visual simulation viewpoints, apart from the environs of the proposed new bridge.
49. A summary of the level of visual effects as identified from each representative viewpoint is set out below.

**Table 4.4: Summary of Visual Effects**

<b>Viewpoint</b>	<b>Level of Effect</b>
The Terrace Ashhurst	Low
SH3 Bridge	Moderate
New Manawatū Bridge from SH3	High
Te Āpiti Wind Farm Lookout	Moderate-low
Junction of SH3 and Hope Road	Moderate

### **COMMENTS ON SUBMISSIONS**

50. Twelve submissions raised matters relating to potential landscape and visual effects of the Project. Each of these is commented on below. The Project's effects on natural character of waterbodies and their margins was not specifically raised in any of the submissions.

#### *Department of Conservation (submission 369)*

51. DOC's submission raises issues in relation to the Manawatū Gorge Scenic Reserve carpark area and facilities near the proposed Manawatū River Bridge, citing potential social, noise, landscape, natural character and amenity effects for recreational users of the Reserve.

52. I concur that the redevelopment of this recreation facility will require consideration to recognise and protect the biophysical, landscape, and visual values of this location. The width of designation near the carpark provides sufficient area to accommodate a re-design of the carpark and entrance to the Scenic Reserve. In addition, the design guidance of the Design Framework and requirements in proposed condition PN2 (Manawatū Gorge Scenic Reserve car park) provide clear direction as to the design, reinstatement and management of this carpark area.

#### *QEII National Trust (submission 314)*

53. QEII considers that adequate weight has not been given to the significance and value of the covenanted areas, and that the proposed alignment should avoid the covenants rather than rely on mitigation.

54. The western end of the NoRs presents the greatest challenge in terms of landscape, natural character and visual effects, and the two covenanted areas (i.e. QEII West and QEII East), which cover steep narrow forested gorges, are part of this. Considerable attention by the Project team was given to minimising adverse effects on the covenanted land. The two covenanted areas affected by the NoRs are long and relatively narrow and run north-south whereas the route runs east-west. Altering the designation by pushing either north towards Saddle Road or south towards the Scenic Reserve would still result in the covenanted land being crossed. Doing either of these would also have significant implications on the gradient of the proposed road.
55. The potential crossing points of the covenanted land by the NoRs were carefully determined, as were the way in which the crossings were achieved (e.g. minimising the length of the crossing point and its height and proposing a bridge instead of a culvert across one of the 'arms' of the QEII West covenant). The detailed design of the road alignment provides an opportunity to refine the crossing points in the covenanted areas and to design the crossings to further minimise adverse landscape, natural character and visual effects. Proposed condition 5(e) requires that the outline plan/s must demonstrate that the two covenanted streams (QEII Trust west (stem 7A) and QEII Trust east (stems 6A, 6B and 6C)) are not permanently disturbed beyond the maximum lengths specified in the condition.
56. The potential landscape, natural character and visual effects on the other four covenanted blocks were considered in relation to the overall context of the designation but are not directly affected by the designation corridor itself. The proposed mitigation measures as set out in conditions 12 and 13 provide opportunities to achieve landscape and ecological connections between these other covenants to other areas of native vegetation and in places to the Scenic Reserve and to the wider landscape.
57. Presence of three other covenanted areas which lie outside the designation corridor (as shown on Figure C-06), will also contribute to the overall landscape character and they will enhance driver experience as there are places along the designation where they will be visible, contrasting with the areas of open pasture.

*Te Āpiti Manawatū Governance Group (submission 374)*

58. Given their long-term involvement and interest in the area, the Te Āpiti Manawatū Governance Group is interested in how the Project will enhance the area and increase visitor opportunities. The Group's submission is generally positive about what the Project will achieve in terms of biodiversity and recreational opportunities. The lack of adequate walking and cycling facilities being included in the Project is the Group's main concern.
59. The Governance Group is currently developing a master plan for Te Āpiti Manawatū Gorge, which will focus on the visitor experience and creating regional-wide linkages. I understand that public consultation on the draft is scheduled to occur early this year with the final draft tabled at the end of May 2019. Given this timeline, there may be opportunities for aspects of the master plan to be considered in the detailed design phase of the Project.

*Forest and Bird (submission 295)*

60. Forest and Bird considers that the Project would result in significant adverse effects on the environment and that the proposed conditions are insufficient to address these effects. Their submission focuses entirely on effects on flora and fauna and it does not specifically mention landscape, natural character or visual effects.
61. The submission refers to planting completed as part of the Mackays to Peka Peka Expressway project and states this illustrates the lack of confidence Forest and Bird has in the Transport Agency's mitigation efforts on large roading projects. The lack of maintenance and weed control on the Expressway is mentioned with two photographs included to illustrate this.
62. I am very familiar with the Mackays to Peka Peka Expressway project, having been closely involved since 2011. I am still involved in the monitoring and maintenance of the revegetation and amenity plantings. After three years, the consent requirement to achieve an 80% canopy over the approximately 1.2 million mostly local indigenous plants has been exceeded virtually along the entire route.
63. As part of my ongoing involvement, in late 2018 I completed, with others, a comprehensive review of mitigation planting on this project. We identified

small, isolated patches of planting where plants have failed to establish or thrive and where maintenance needs attention. These issues are currently being addressed by the landscape contractor for the project, whose contract runs until the end of September 2019 for terrestrial planting and a year later for the wetland planting. In other words, the mitigation planting and establishment process for that project is still in progress.

64. Consequently, in my view the mitigation planting for the Mackays to Peka Peka Expressway project does not illustrate any shortcomings or failure by the Mackays to Peka Peka Expressway Alliance or Transport Agency.
65. Mitigation measures for this Project will be developed during detailed design. Proposed condition 12 provides that a landscape management plan must be prepared prior to construction and that this must (amongst other things) describe how permanent works are integrated into the surrounding landscape and how vegetation is identified and protected and describe the proposed planting. These measures will be implemented during the construction phase and the prescribed maintenance period following as is standard contractual practice.

*Manawatū River Source to Sea (submission 306)*

66. The submission suggests that local landscape features, including significant or unusual geological and geophysical features (i.e. geo-sites) require viewing points from the proposed road, and request that rest areas be included to enable this. The Design Framework sets out in section 3.7 the provisions for safe stopping places, which will be developed for the Project during the design phase. **Chris Bentley** has, in his evidence, prepared a new version of the Design Framework which further highlights the opportunity to reveal geological features and consider visual access to them in combination with safe stopping places and lookouts.

*Horizons Regional Council (submission 292)*

67. The submission generally supports the NoRs being confirmed and accepts the rationale for seeking a designation in the area north of the Manawatū Gorge.
68. Horizons comments however that the NoRs do not adequately address the future-proofing of safe walking and cycling connections and that the process of developing an alternative route to the Manawatū Gorge should

*“take advantage of the opportunity to establish a separate walking and cycling corridor across the Ruahine Ranges integrated with existing tourism and amenity features”*. I comment on the matter of a separated walking, cycling and bridle path below in response to Build the Path submissions.

*Wellington Conservation Board (submission 204)*

69. The Board urges the Transport Agency to incorporate plans for building a cycleway/walkway alongside the new highway together with associated extensive native amenity planting. I comment on this matter below in response to Build the Path submissions.
70. The submission also refers to the prospect of an unplanted highway, similar to the Taupō bypass, as being an unpalatable outcome. The Design Framework provides for the contrary, with a range of mitigation measures proposed.<sup>9</sup> In addition, proposed condition 5(e) provides that the outline plan/s must demonstrate that the area of indigenous vegetation removal does not exceed specified levels; and proposed conditions 12, 13 and 17 provide for (respectively) a Landscape Management Plan, replacement and offset planting and an Ecological Management Plan. These measures will ensure that planting is given appropriate attention in final design.
71. However, the intention is not to plant along the full length of the designation corridor / road but instead that mitigation measures respond to landscape and ecological and other effects. This may mean that the existing open farmland / working rural landscape is retained in some areas, as well as planting in other areas.

*Meridian Energy (submission 363)*

72. Meridian Energy (“**Meridian**”) raises concerns about the impact of proposed offset mitigation planting on wind flows. In its submission, Meridian states that turbine siting *“was based on the funnelling effect through the Manawatū Gorge, the terrain contours of the site itself and the land cover across the site, in this case open pasture.”* It notes that wind flows can be significantly altered by vegetation.

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<sup>9</sup> Landscape and amenity planting at strategic locations; planting indigenous vegetation along the fragmented by the corridor; areas of secondary broadleaf vegetation; design of batter slopes and spoil disposal areas to integrate with adjoining natural landforms.

73. The Project proposes alterations to landform through earthworks to construct the highway and the creation of fill sites. It also proposes areas of existing vegetation to be removed and other areas of mitigation planting for ecological, natural character and amenity purposes. Conditions 12 and 13 set out the proposed planting, including the limitations to planting within the wind farm (i.e. Conditions 12(f) and 13(d)).
74. Conditions 12(f) and 13(d)) set out the requirements for planting in Meridian's Te Āpiti Wind Farm site, which will mean that the planting mitigation measures summarised in Table 4.18 in Technical Assessment 4 will be affected. Conditions 12(f) and 13(d) allow for restoration planting in the QEII Trust open space covenants, elsewhere in the Te Āpiti Wind Farm planting must not exceed a height of 1.5m at maturity unless written consent is provided by Meridian. The 1.5m height restriction will allow areas to be revegetated with indigenous species rather than pasture providing benefits for water quality, visual and landscape effects through restoration of disturbed land and some biodiversity benefits. However, the diversity of species that can be established will be limited and this will not enable long term successional processes to reestablish forest.

*Tararua District Road Safety Group (submission 376)*

75. The submission requests that access to a wind farm viewing point should be provided from the proposed road. The proposed designation passes through the Te Āpiti Wind Farm similarly to the way Saddle Road does currently. The Design Framework identifies potential wind farm stopping/viewing/interpretation areas as a Project opportunity. This will ensure that the opportunity for safe stopping and viewing areas is explored as part of final design.

*Nicholas Shoebridge (submission 103)*

76. Mr Shoebridge's residence and property at 49846 Napier Road is close to the proposed roundabout at Woodville. He is concerned about the proximity of the roundabout in relation to his property, particularly the effects of the lighting at the roundabout and traffic headlights on amenity.
77. The next phase of the Project will address the detailed alignment and design of the highway, including the detailed location and design of the roundabout and the concerns raised by Mr Shoebridge can be considered

as part of this process. Condition 12 (e)(vi) specifically requires that Mr Shoebridge (and landowners at 49846 Napier Road) are consulted with regard to design landscape treatments for the purpose of noise mitigation and screening. I consider that through careful design and the use of a range of measures that mitigation can be achieved.

*John and Wendy Napier (submission 296)*

78. The Napiers live at 75 Hope Road, close to the proposed designation corridor. They are concerned about the effects of the noise from the road and request planting of trees along the proposed road boundary to minimise the visual effects.
79. While tree planting along their property boundary would not reduce noise levels, being screened from an activity such as a road, could have benefits in terms of perceived noise; this is addressed in **Dr Stephen Chiles'** evidence. Tree planting would however provide visual screening of the designation corridor and there are obvious benefits of boundary planting being done early once the road alignment has been confirmed.
80. The next phase of the Project will address the detailed alignment and design of the highway and the concerns raised by the Napiers can be considered as part of this process. Condition 12 (e)(iv) requires mitigation planting design to be developed in consultation with the Napiers (owners of 75 Hope Road). I believe that effective mitigation can be achieved through such planting.

*Murray Ramage (submission 170)*

81. Mr Ramage owns 21.3ha of bare land on Hope Road, which is 50 to 100 metres from the edge of the proposed designation at the Woodville end. He is concerned about the outlook from his property and that the Project will adversely affect the rural character.
82. The next phase of the Project will address the detailed alignment and design of the highway and the concerns raised by Mr Ramage can be considered specifically as part of this process. Mitigation of adverse landscape and visual effects is a key consideration and the Design Framework sets out a series of corridor design principles in relation to the location, design and appearance of the elements that will form part of the Project. As part of the proposed designation conditions, a Landscape

Management Plan must be prepared prior to the commencement of construction to address the potential adverse effects of the Project on the landscape, visual amenity and natural character values. The proposed condition outlines what the Landscape Management Plan must include.

83. In addition to mitigation of long term effects, the potential effects of construction traffic have also been addressed in the conditions (Condition 22(e)(ii)).

*Build the Path submissions (submission 316 and others)*

84. Including a separate cycleway path as part of the Project has not been part of the scope of my assessment and so I have not considered the landscape, natural character and visual effects of a separate path. Clearly adding a separated 3m-wide path to the Project would likely widen the earthworks footprint and could pose additional challenges in terms of minimising effects on the covenanted areas and other streams and vegetated gullies.

**RESPONSE TO QUESTIONS OF THE HEARING PANEL**

***Do the design principles reflect strongly enough the ecological constraints and need for protection on the Western Slope and land identified by the Queen Elizabeth II National Trust? Please explain why greater specificity is not provided in relation to the assessed bridge outcomes in these areas.***

85. The western slope and the QEII open space covenants are particularly sensitive from a landscape, visual amenity and natural character perspective and I acknowledged this in Technical Assessment 4. This area posed the greatest challenges and led to scrutiny by all the experts advising the Transport Agency on the Project.
86. It is not just the design principles in the Design Framework but the combination of the principles and the amended conditions – which require a Landscape Management Plan (LMP, condition 12) and an Ecological Management Plan (EMP, condition 17), to be produced prior to the commencement of construction – that I consider will achieve a level of protection of the ecological areas on the western slope and in the QEII open space covenants. Both the LMP and EMP form part of an overarching Construction Environmental Management Plan (“**CEMP**”), which will ensure the various Project components are addressed in an integrated way.

87. The width of the designation on the western slope has been confined with other controls such as the ecological effects envelopes to minimise potential effects and encroachment on the indigenous vegetation and stream, which effectively limit the design options available but allow some flexibility to encourage a fresh look and innovation at the detailed design stage. Using bridges and retaining walls at stream crossings in the covenant areas are other measures to reduce adverse effects and these aspects are addressed in the Design Framework.

***Should effects on the Te Āpiti wind farm be “minimised” or should they be avoided?***

88. In terms of land use, the Te Āpiti Wind Farm and the proposed highway are not incompatible but they each have different operating requirements. I understand there have been further discussions between Meridian and the Transport Agency in relation to minimising potential adverse effects on the Wind Farm. **Ms McLeod** in her evidence presents the outcome of these discussions and the update to the conditions as a result of this.
89. The amended condition 12(f) and 13(d) reflect how the requirements of each activity can be accommodated.
90. **Mr Dalzell** in his evidence explains how under the Public Works Act 1981 compensation will be payable to Meridian for any adverse effects on the Te Āpiti Wind Farm.

***Meridian’s submission expresses concern regarding the effect of new planting on the operation of their wind turbines. Has the planting you recommend been designed to avoid any such effects?***

91. The land along most of the designation, including that where it traverses the Te Āpiti Wind Farm is a working rural landscape in pasture. The areas of woody vegetation, indigenous or exotic are few and limited. Any mitigation planting should reflect the character of the receiving landscape and tree planting in the wind farm would be out of context.
92. The key to landscape mitigation throughout the designation will be the treatment of the landform, particularly the way batter slopes and fill disposal areas are integrated with the surrounding landform. It is anticipated that

these new landforms would be formed with sufficient topsoil to support pasture.

93. Within the wind farm, I anticipate there will be areas of low stature planting around stormwater disposal areas, but areas of woody vegetation would be very limited and mostly confined to planting associated with restoration of the QEII open space covenants. Conditions 12 and 13 have been amended to avoid new planting adversely affecting the operation of the wind turbines.

***What is the current status of PC65 and does its current status have any impact on your conclusions?***

94. Mr Hudson in his evidence as part of the Section 42A report, states that he “recently identified the lower portion of the QE West catchment north of the railway line as an ONF in work undertaken for Manawātū District Council for a proposed Plan Change but this has yet to be notified” (i.e. PC65).
95. Mr Percy and Ms Coplestone also confirm in the planning evidence for the Section 42A report that PC65 is yet to be notified.
96. The current status of this area does not have any impact on my conclusions; the area has landscape and ecological value because of the nature and quality of the vegetation and streams that are present and constraints on the alignment as set out in the conditions and the Design Framework are appropriate.

***Are your conclusions/recommendations set out in paragraphs 176, 177, 195, 196, 229, 230, 250, 268, 269, 282 and 283 addressed in the NOR conditions offered by NZTA?***

97. My recommendations to address landscape, visual and natural character effects have been addressed in Condition 5(c) MGSR Car Park Plan, Condition 11 (CEDF), and Condition 12 (Landscape Management Plan) and via the Sections 2 and 3 of the current version of the CEDF.

***In your view, how can the QEII streams be best protected against the effects of the proposed road alignment? Would there be significant ecological benefit in realigning further to the north?***

98. I have recommended possible measures to reduce effects on the QEII covenants that are included in the CEDF to guide the detailed design

process. This could be achieved through refinement of the alignment and use of bridges in place of culverts to minimise the size of the footprint, as well as re-establishment of vegetation of the stream margins.

99. Where and how the designation corridor crosses the two QEII open space covenants was subject to considerable team discussion and debate to minimise adverse environmental effects on these areas. The steep broken terrain, together with the east-west alignment of the designation corridor and the north-south alignment of the covenanted stream and gully systems, posed significant challenges. In crossing the covenants, the aim was to select a crossing point that minimises modification and disturbance of landform, minimises the effects on streams and minimises the removal or disturbance of indigenous vegetation. The crossing point also had to achieve the highway gradient, horizontal geometry and engineering requirements.
100. Realigning the road alignment to the north may have some landscape and ecological benefits but my understanding (as discussed in the evidence of **Mr Whaley**) is that because of the terrain it would require substantially more earthworks and a greater amount of fill to be disposed of, and this would lead to other adverse environment effects. In addition, if the alignment were to be located further north this change would also affect the alignment both east and west of it.

***Please clarify how the proposed road is supporting the Horizons One Plan Objective 6-2 when the effects of the road on the QEII streams has been identified as significant at the crossing locations (Table 4.2 page 9) through a reduction in one whole category of condition.***

101. Using a natural character assessment of rivers methodology developed and applied on other New Zealand rivers, has provided a framework to assess effects in relation to a wide range of relevant attributes at the Project's river and stream crossings. As explained in paragraph 41 of Technical Assessment 4, the natural character effects of the designation corridor were assessed at two levels, at the crossing point based on the indicative alignment that was considered (i.e. site-specific scale, Table 4.2) and at an overall stream scale (Table 4.3).
102. As shown on Table 4.3, when the alignment is considered in the context of the whole stream the step change in effects is unaffected or reduced by half

a step change (i.e. High to Moderate/High). The rationale for adopting this approach is because:

- (a) Streams are interconnected ecosystems and effects need to be considered in context. While adverse effects may occur at one point on a stream the effects are influenced by the stream condition downstream and upstream of the actual crossing point.
- (b) Similarly, if a stream or river at one point were to be assessed as outstanding that does not mean the entire stream/river should be deemed to be outstanding. The Manawatū River is a good case in point; its condition varies significantly along its length depending on its context and its condition.

103. The limit imposed in Condition 5(e)(i) places upper limits on the length of streams in the QEII West and QEII East covenants that can be permanently disturbed by diversion or other physical modifications.

***Is there an alternative route choice for the western end of the NOR that could avoid crossing the ONL and have lesser effects on landscape and natural character? If so, where would this route lie?***

104. The Manawatū Gorge ONL (which includes Parahaki Island) and the Pohangina Valley ONL are located at the western end of the designation corridor. There is only a small gap between them. The challenge was to identify an alignment that minimises the impact on ONLs and also other areas that have landscape and ecological values, which led to the proposed alignment, acknowledging there would be adverse landscape, natural character and visual effects and also ecological effects on the northern bank. However, the adverse effects will be mitigated by restricting the width of the designation in this area, together with the ecological effects envelopes.
105. Following the second NoR mitigation workshop, an alignment further west was considered. This involved a new bridge over the Manawatū River avoiding Parahaki Island, and over the railway line, and then the alignment headed west along the river terrace; it then curved eastwards and ascended the steep western slope. This option would also have adverse landscape and visual effects (eg indigenous vegetation removal, significant cuts), and there are significant road geometry issues (i.e. the curves are too

tight to meet the design speed and there is insufficient distance to ascend the steep western slope at a gradient of 8%).

106. Earlier in the process, a series of Ashhurst sub-options were considered using an MCA tool as part of the DBC process, one of which (Ashhurst B) involved an alignment off SH3, which severed a triangular area of properties between York and Cambridge Streets, a new bridge over the railway line, a new bridge over the Pohangina River and across the southern end of the Pohangina Valley ONL and then ascending the western slope to connect with Option 3.
107. Like the Project, Ashhurst Sub Option B would also have had adverse landscape, natural character and visual amenity effects, to varying degrees.

***In your view, are the effects of the large cut to accommodate the access road through gully systems sufficiently significant to suggest an alternative solution to access be adopted?***

108. The proposed wind farm access road is a Meridian requirement to service its wind farm. The road will be 6.0m wide and in the indicative alignment it will run parallel to the Project immediately to the south. The access road crosses several gullies, requiring cuts and fills. At the western end of this road it crosses three stems of the stream in the QEII East open space covenant (CH 6100 to 6400) and prominent gullies at CH6900 and CH7300-7400.
109. These effects are such that alternative solutions should be considered further; ideally the access road would avoid crossing the QEII East open space covenants and the other two gully crossings referred to. I understand that **Mr Whaley** considers that outcome to be difficult to achieve, but that the current indicative alignment can be moved to reduce the footprint.

***Please explain what the 'SEV value' means and the relevance of the SEV values of streams being higher or lower than the reference sites in data provided by Horizons Regional Council.***

110. The SEV assessment was part of the work completed by freshwater ecologist, **Kieran Miller**, who was part of our team carrying out the assessment of natural character of the river and streams.
111. **Mr Miller** has answered this question in his evidence.

## COMMENTS ON COUNCIL SECTION 42A REPORTS

112. I have considered the comments in relation to landscape, natural character and visual matters made in the s42A report of Mr Hudson and Mr Percy/Ms Copplestone. I have also considered the comments made in respect of natural character by Mr Brown and Mr Lambie.
113. Mr Hudson addresses the full range of topics covered in Technical Assessment 4. He accepts my assessment and conclusions on landscape effects of the Project are appropriate but raises an issue on the effects on landscape character where the road “*crosses the grain of the steeply folded Ruahine Range.*” He observes that the landscape effects on the Ruahine Ridgeline ONL need to be tested against the provisions of the applicable plans, including cumulative effects.
114. Mr Hudson also agrees with my findings on visual amenity affects and agrees that much of the visual assessment should be carried out as part of the detailed design process. He comments on views from the road and how road user experience can be enhanced and acknowledges that this aspect has been incorporated into the Design Framework, which in turn is addressed by way of conditions.
115. Much of Mr Hudson’s commentary focuses on the assessment of natural character, the methodology used, and the level of effects on natural character on the river and streams and their margins determined by the team of experts who carried out the assessment. Mr Brown, Mr Lambie and Mr Percy/Ms Copplestone have similar comments in relation to the assessment of natural character.
116. Mr Hudson is critical of the natural assessment methodology and highlights in his view, several shortcomings. Mr Hudson acknowledges that we supplied him with a copy of our methodology early in the NoR process and that he made two comments about it, which we addressed. **Dr Forbes**, who was part of the natural character assessment team, supplied Mr Lambie with a copy of the methodology, but we did not receive any comments from him.
117. In summary, Mr Hudson in his comments on the natural character assessment:

- (a) Agrees with the use of two scales used in the natural character assessment;
- (b) Agrees that there are no areas of outstanding natural character within the study area;
- (c) Agrees with the steps the assessment process followed (i.e first assessing the existing level of natural character then assessing the level of natural character anticipated after construction of the highway, and then considering the significance of the change);
- (d) Disagrees with way these steps have been applied in relation to Horizons' One Plan's Objective 6-2(b);
- (e) Disagrees with the way in which the attribute ratings have been applied and that weighting was not applied to different attributes;
- (f) Disagrees with how the experiential and context ratings were assessed and in particular for the QEII East Whole Stream rating;
- (g) Contends that the overall level of effects on the streams in the Western Slope and QEII East and West streams have been diluted as a result of taking the attributes and qualities of the whole stream into account;
- (h) Disagrees with the thresholds used in seeking to avoid the overall level of an area's natural character being reduced and instead contends that Objective 6-2(b) requires any significant reduction of any single attribute or quality to be avoided;
- (i) Contends that effects on streams that were not assessed as having high natural character were not considered in accordance with Objective 6-2(b)(iii); and
- (j) Contends that the collective effect of multiple stream crossings has not been considered and that a cumulative effects assessment has not been undertaken.

118. In his comments on natural character Mr Brown accepts that the natural character assessment methodology is robust and repeatable but raises several similar points to Mr Hudson on the methodology and its application. In particular, he:

- (a) Contends that attributes fail to consider the regional context and that the attributes do not account for the values within Schedule B of the One Plan;
- (b) Contends that only the long-term effects of the Project are considered in the assessment;
- (c) Disagrees with the thresholds of significantly diminished effect used;
- (d) Contends that the treatment of all attributes as being equal undervalues some of the more important drivers of natural character at both a site and reach scale;
- (e) Disagrees with how the assessment scales have been used; and
- (f) Considers that determining the overall change in natural character as the result of the Project is inconsistent with Objective 6-2 (i.e attributes and qualities).

119. Mr Lambie raises two matters:

- (a) The lack of weighting of attributes, particularly on the riparian stream margin and stream form; and
- (b) A view that giving effect to the biodiversity effects through offsetting as proposed by **Dr Forbes** will not necessarily translate to mitigating effects on the natural character of a stream because the offsets may not occur in the same catchment.

120. Mr Percy/Ms Copplestone in their planning evidence reiterate the matters raised by Messrs Hudson and Brown, conclude that there are four issues in relation to natural character still in contention, namely:

- (a) *The methodology used to evaluate natural character, and to determine the level of change to natural character as a result of the Project is flawed.*
- (b) *There may have been a possible underestimation of the natural character change between current and future conditions.*
- (c) *The natural character assessment assumed that the extent of works that were likely to affect natural character is represented by the works footprint represented on the NOR indicative design. It is likely*

*that the actual footprint of the works, even assuming the indicative design, will be greater than predicted due to the need to accommodate erosion and sediment control measures in some areas where there is very limited space, if any, within riparian areas.*

(d) *The Project and associated works [do]es not meet s6(a) or the relevant objectives and policies of the One Plan that are directive in the management of effects on natural character of wetlands, and rivers, lakes and their margins.*

121. Mr Percy/Ms Copplestone in paragraph 521 acknowledge the inconsistent terminologies used in Objectives 6-2 and Policy 6-8 of the One Plan where characteristics and qualities are used in clause (a), attributes and qualities in clause (b) and attributes and characteristics in Policy 6-8.
122. They contend that the methodology used to determine the existing level of natural character of the river and streams and the Project's potential effects on natural character is not "*sufficiently robust*" and they recommend that a revised natural character assessment be carried out and/or that "*the designation boundaries are amended to provide an alternative alignment that would avoid streams and wetlands and their margins that have or are likely to have high natural character.*"
123. Below, I have set out my response to the points raised by Messrs Hudson, Brown, Lambie and Percy and Ms Copplestone in relation to natural character.

#### **Natural character methodology and application**

124. To my knowledge there is not an accepted natural character methodology in New Zealand. In my opinion, the natural character assessment used for the Project is robust and fit for purpose.
125. I and the other members of the assessment team did not undertake catchment scale assessments. While in some of our nomenclature we may have referred to catchment in places, our focus was on whole streams (i.e. the waterways and their margins). A catchment scale assessment is more aligned with what is sometimes carried out as part of a district or area-wide landscape study or assessment.

126. The presence of QEII open space covenants or ONLs does not affect the assessment of natural character. Natural character considers the current condition of rivers and waterbodies and their margins.

### **Methodology**

127. As described in Appendix 4A, the natural character assessment methodology is based on several coastal and river natural character assessments that Boffa Miskell has carried out for regional and district councils throughout New Zealand. My firm contributed to the development of the methodology developed by DOC for coastal natural character studies to support NZPCS 2010 policies and have adapted this to river natural character studies that we have we recently completed for Otago Regional Council and Canterbury Regional Council.
128. The methodology for each assessment has been tailored to respond to the study area, study purpose and statutory framework. A common feature of these assessments is the involvement of a range of disciplines, a collective approach on the range of attributes to be assessed, the assessment matrix and the determination of ratings.

### **Dilution**

129. The whole stream assessment was undertaken in addition to an assessment of the crossing points for streams with an existing high level of natural character.
130. In his paragraph 35 Mr Hudson contends *“the very real risk of dilution or discounting of effects is evident when assessing effects between whole streams versus the crossing scale. For example, QEII East (Table 11) is assessed as having an existing High level of natural character for both the crossing and whole stream. Despite a reduction in the level of natural character at the stream crossing after construction of the road (i.e. from High to Moderate), the Whole Stream is assessed by NZTA experts as remaining as High even though the crossing footprint affects 450m of the 1.5km stream length.”*
131. It is logical that the magnitude of effects of an activity is likely to be lessened when considered at a larger scale than when considered at a more localised site scale and this is noted in Appendix 4.A (page 3 and Tables 1 and 2). Given that we were dealing with an indicative alignment

and in places with several options, we took a conservative approach in calculating the areas of stream and margins that could be potentially affected.

132. The total length of QE II East stream *and* tributaries is 2.3km<sup>10</sup>. The road footprint of the indicative alignment crosses 308 linear metres of stream (and crosses 3 stems of the stream). Conservatively, in my assessment I assumed that the length affected by the road could be as much as 450m of stream. This degree of conservatism was added to take into account that the NoR assessment considered an indicative design, for which the extent of footprint might be somewhat greater.
133. To elaborate; 1.0km of the QEII east stream lies within the forested slopes of the Manawatū Gorge Scenic Reserve, which has high attribute ratings due to its unmodified nature. The upper part of the stream where the road footprint encounters the stream is relatively modified and therefore has a lower level of natural character. Because the modification will occur in an already modified part of the stream, the higher rating portion of the stream in the Reserve will remain unmodified. We considered that the change in natural character of the upper part of the stream was not sufficient to reduce the post-construction overall rating of the stream.
134. In any event, determining the overall level of effect on natural character is not simply a numerical calculation of the proportions of stream length affected; rather, the exercise requires consideration of how the development will change the specific attributes and qualities which contribute to natural character. Based on the collective judgement of the team we maintain that our rating is an accurate reflection of the level of effects.

### **Attributes**

135. In paragraph 30, Mr Hudson states that, *“Both Mr Brown and Mr Lambie agree that the attributes and qualities within the One Plan (specifically Policy [6-8]) should have been considered in greater detail as part of the natural character assessment.”*
136. The One Plan does not provide guidance on the criteria to be used in natural character assessments of fresh water environments other than

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<sup>10</sup> Which is different to the 1.5km stated in Technical Assessment 4.

Policy 6-8(c) that includes a list of characteristics or attributes that may contribute to an area's natural character (which is taken from Policy 13 of the NZCPS). The attributes used in our natural character assessment do incorporate in detail the Policy 6-8 list and these have been tailored to freshwater environments. Table 4.5 below sets out a comparison.

**Table 4.5**

Horizons One Plan Policy 6-8(c) Attributes and characteristics.	Natural Character attributes assessed
(i) Natural elements, processes and patterns,	Flow Regime Active bed/body shape, Water Quality Indigenous taxa assemblages Ecosystem functioning Presence / absence of exotic aquatic flora and fauna Terrestrial ecology Context
(ii) Biophysical, ecological, geological, geomorphological and morphological aspects,	Flow Regime Active bed/body shape, Water Quality Indigenous taxa assemblages Ecosystem functioning Presence / absence of exotic aquatic flora and fauna Terrestrial ecology Structures and human modifications Context
(iii) Natural landforms such as headlands, peninsulas, cliffs, dunes, wetlands, reefs, freshwater springs and surf breaks,	Active bed/body shape Context
(iv) The natural movement of water and sediment including hydrological and fluvial processes	Flow Regime
(v) The natural darkness of the night sky,	N/A
(vi) Places or areas that are wild and scenic,	Context Experiential
(vii) A range of natural character from pristine to modified, and	All Attributes
(viii) Experiential attributes, including the sounds and smell of the sea; and their content or setting."	Experiential

137. Mr Hudson (paragraph 66) bases some of his comments that there is a clear delineation between quantitative and qualitative attributes used in the assessment. He considers that all of the attributes, with the exception of two, are quantitative (i.e. that context and experiential attributes are qualitative). I disagree that the attributes fall into one or other camps.

138. While many of the attributes are science based and at some technical level may be able to be measured, for this natural character assessment they have been described and assessed by the relevant experts individually and as a group, in qualitative way, albeit in some cases having drawn on quantitative data.
139. In paragraph 61, Mr Hudson contends that “*the median process relied on in the methodology provides no scope for qualitative judgement to influence the relative importance of a major decline in key attributes.*”
140. As noted above, the attributes were described and assessed using qualitative professional judgement by the relevant expert (with some reliance on quantitative data). The ratings for each attribute were also discussed and tested by the expert group. The median process was agreed to be the most appropriate method to indicate the overall level of natural character based on the 10 attribute ratings. The median rating was then considered by the expert group and calibrated with other relevant median ratings to ensure they reflected our collective professional judgement of the development scenarios being considered.

**Thresholds: Interpretation of One Plan Objective 6-2(b)(ii)**

141. Natural character is about condition. It is a term to describe naturalness (lack of modification) of coastal and river/stream/wetland environments. To understand that condition a range of attributes and their interrelationship with each other needs to be assessed with the whole being greater than the sum of the parts.
142. Policy 6-8(c) lists of characteristics or attributes that may contribute to an area’s natural character. This supports the concept that natural character needs to be considered as the combination of attributes and characteristics.
143. I consider that natural character reflects a combination of attributes that comprises the whole, and that for the level of natural character to change, the overall rating needs to change. Given the close interrelated nature of the attributes, if an activity affects one attribute it is also likely to affect others and together, such changes may affect the overall rating.
144. Consequently, in our assessment we considered both individual attributes and how they contributed and interacted with each other. For transparency, in our assessment of existing natural character, the individual ratings,

together with an explanation for each attribute, is provided in a series of tables.

145. In the integrated approach we adopted when assessing both the existing and post-development levels of natural character, we determined that a one-step reduction in the 5-point scale rating would "*significantly diminish the attributes and qualities of areas that have natural character*". Given that Objective 6-2(b)ii only applies to areas of high natural character, we did not determine what *significantly diminish* would mean in relation to more modified areas.

### **Weighting**

146. I disagree with Messrs Hudson and Brown that weightings should be given to different attributes. In his paragraph 63, Mr Hudson contends that there is no expert judgement involved in determining the relative importance of individual attributes. Our approach ensured that expert judgement was applied to the individual attribute ratings and to the collective decision of the team through the workshop and subsequent team discussions held to review the ratings and to determine the overall level of natural character.
147. Introducing weightings amongst a team of experts from different disciplines is fraught with difficulties with a risk of who decides on the level of weightings to the various attributes. In my opinion, it is far more important to involve a group of experts in determining and agreeing on attributes or criteria to be used in an assessment and then jointly discussing and evaluating the ratings and providing an overall judgement.
148. Appendix 4A provides a great deal of transparency and detail of the methodology, the attributes and their ratings and the application of the methodology; the assessment is a robust and repeatable process.

### **Other areas: assessment against Objective 6-2(b)(iii)**

149. One Plan Objective 6-2(b)(iii) addresses waterbodies that do not have a high level of natural character. The proposed road crosses several permanent and intermittent streams along its length (refer map C-10) that we have assessed as not having high natural character. The broadscale assessment of the waterbodies included a generic assessment of the streams and wetlands along the designation and assessed them as having a moderate level of natural character.

150. Minimising adverse effects on streams will be an important driver through the detailed design and subsequent resource consent processes. It is unlikely that many of the streams can be completely avoided through refining the road alignment as the streams generally flow north-south across the designation corridor. Mitigation of effects on the natural character of the streams is addressed in the Design Framework (section 2.2 Project Specific Principles and section 3, particularly 3.2 Ecologically Sensitive Areas and Natural Character of Streams and 3.4 Waterbodies).

### **Regional context in relation to attributes**

151. Mr Hudson in paragraph 30 and Mr Brown in paragraph 21 raise matters in relation to the attributes we used and assert that they do not account for the factors set out in Policy 6-8 of the One Plan. Several of Mr Brown's comments relate to the water quality component. Dr Olivier Ausseil and Dr Michael Greer from Aquanet were the water quality experts in the team and I have relied on them to address these matters. Dr Greer has confirmed that the water quality component does consider several of the attributes set out in Policy 6-8 (c). Specifically:
- (a) Nutrient concentrations were considered in the context of their natural state. Nutrients are a major driver of plant growth, which is one of the most sensitive natural processes to changes in water quality (c)(i).
  - (b) Nutrient, toxicant, and faecal contaminant concentrations were considered in the context of their natural state. These are attributes of the biophysical aspect of natural character (c)(ii).
  - (c) Water clarity was considered in the context of natural state. Changes in water clarity from reference condition are indicative of both a shift in the movement of sediment in a system (c)(iv), and the experiential attributes of a site (c)(viii).
152. He also noted that the parameters included in the water quality assessment are indicators of the life supporting capacity of the target systems, their ability to assimilate pollution and their aesthetics. The other water management values are not a reflection of the natural character of a system and are not relevant to this assessment (i.e. irrigation, stock water etc.).

153. Dr Greer has also confirmed that the water quality targets in Schedule B of the One Plan were not included in the assessment framework for water quality as they are effects-based thresholds. They are not measures of natural character, and in many cases represent a significant deviation from the natural state of the rivers assessed. Furthermore, the footnote on page 5-11 of the One Plan specifically states that Schedule E is not a component of Part I – the Regional Policy Statement. It is a component of Part II – the Regional Plan.
154. Dr Greer states that while Mr Brown believes the use of the Schedule E targets would allow for the effects of the NoR corridor to be better assessed in a regional context, it is important to note that the Horizons One Plan targets are actually far less specific than the threshold used in this approach. While the Schedule E targets are applied at the Water Management Zone Scale, the thresholds used in our assessment are assigned at the reach scale based on climate, topography and geology.
155. The water quality component of the natural character assessment did include all relevant attributes in Schedule E (i.e. those parameters that do not relate to wastewater discharges are not measures of ecology or habitat) even if the targets were not considered.
156. In relation to phosphorus conditions in the assessed streams Dr Greer does acknowledge that reference state concentrations may have been underestimated due to the geology of the area, resulting in natural character also being underestimated for that parameter. However, as phosphorus and nitrogen were assessed together, the effects of this on the overall assessment is likely to be very low.

### **Application**

157. The natural character assessment was undertaken by a team of five experts from a range of disciplines to ensure that the attributes listed in the Table above were covered comprehensively. A collaborative approach was adopted with the team considering the methodology and assessment criteria used previously for the Otago and Canterbury river studies and making several small additions and refinements to the criteria. Following completion of the individual assessments by each expert, a workshop was held where the assessment for each attribute was discussed.

158. Determining the overall level of existing natural character and the level of natural character post-construction was a collective decision made by all team members. It was ultimately a judgement call made by the team weighing up all the factors and individual assessments.
159. The workshop was held when several different indicative alignments were being considered and so our assessment set out both the individual ratings and the collective Overall Level of Natural Character rating for each of the indicative alignment options being considered and tested. The outcome of this process fed into the Project team's consideration of the indicative options and determining the designation.

**Boyden Evans**

**8 March 2019**