Before a Board of Inquiry
Transmission Gully
Notices of Requirement and Consents

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under: the Resource Management Act 1991

in the matter of: Notices of requirement for designations and resource consent applications by the NZ Transport Agency, Porirua City Council and Transpower New Zealand Limited for the Transmission Gully Proposal

between: **NZ Transport Agency**
Requiring Authority and Applicant

and: **Porirua City Council**
Local Authority and Applicant

and: **Transpower New Zealand Limited**
Applicant

Statement of rebuttal evidence of Mark Alan Edwards (Project design and construction) for the NZ Transport Agency and Porirua City Council

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Dated: 17 January 2012

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STATEMENT OF REBUTTAL EVIDENCE OF MARK ALAN EDWARDS FOR THE NZ TRANSPORT AGENCY AND PORIRUA CITY COUNCIL

INTRODUCTION

1 My full name is Mark Alan Edwards.

2 I have the qualifications and experience set out at paragraphs 2 - 5 of my statement of evidence in chief, dated 16 November 2011 (*EIC*).

3 I repeat the confirmation given in my EIC that I have read, and agree to comply with, the Code of Conduct for Expert Witnesses (Consolidated Practice Note 2011).

4 In this statement of rebuttal evidence, I respond to the evidence of:

4.1 Mr Murray Kennedy and Ms Tracey Grant, on behalf of Greater Wellington Regional Council (*GWRC*);

4.2 Mr Brian Handyside and Ms Helen Kettles, on behalf of the Director-General of Conservation; and

4.3 Mr Don Wignall, on behalf of Kapiti Coast District Council.

5 The fact that this rebuttal statement does not respond to every matter raised in the evidence of submitter witnesses within my area of expertise should not be taken as acceptance of the matters raised. Rather, I rely on my EIC and this rebuttal statement to set out my opinion on what I consider to be the key road design and construction matters for this hearing.

6 For the purposes of this evidence, I will refer to the NZ Transport Agency (*the NZTA*) Project[1] and the Porirua City Council (*PCC*) Project[2] collectively as the "Transmission Gully Project" (and hereafter, *the TGP* or *the Project*).

SUMMARY OF EVIDENCE

7 I have read all of the statements of evidence provided by submitters in relation to my area of expertise. The evidence from the submitters has not caused me to depart from the opinions expressed in my EIC and I re-confirm the conclusions reached in my EIC.

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[1] The 'NZTA Project' refers to the construction, operation and maintenance of the Main Alignment and the Kenepuru Link Road by the NZTA.

[2] The 'PCC Project' refers to the construction, operation and maintenance of the Porirua Link Roads (being the Whitby Link Road and the Waitangirua Link Road) by PCC.

EVIDENCE OF SUBMITTERS

Evidence of Murray Kennedy

8 Mr Kennedy makes reference throughout his evidence to Bridge No.9 at distance 11750m as shown on NZTA volume 4 plan set sheet 9 of 21. This reference should be to Bridge No.8.

9 At paragraph 11 of his evidence, Mr Kennedy states the Regional Council would be satisfied with either of the proposed solutions to providing dual access across the Project for recreational and logging purposes and that solution 1 is the Council's preferred solution.

10 I agree that solution 1, to use Bridge No.7 for recreational use and Bridge No.8 for logging trucks is likely to be a better option and recommend this be investigated as part of the detail design. In consultation with GWRC, the design should also take specific account of access requirements during construction, delays to operational and recreational users and the temporary access needed for equestrian riders as indicated by Mr Kennedy.

Evidence of Tracey Grant

11 Paragraph 27 of Ms Grant's evidence is correct in that no consents have been applied for to take water from watercourses or groundwater from within the site. The Project at this stage has assumed that water will be transported from off-site (as stated in my EIC paragraph 81). If water take is required at a later stage then the appropriate consents would be obtained.

12 Ms Grant also notes that construction of small temporary dams has consenting implications[3]. As stated in my EIC paragraph 82, the constructor would obtain the necessary consents if they chose to adopt this method of water collection.

13 In paragraphs 53-56 of her evidence, Ms Grant discusses forestry removal and the need for a new consent condition requiring a 'Forest Harvest Plan' to be produced. I support Ms Grant's proposed condition for inclusion of a Forest Harvest Plan because it will ensure that the effects during forestry removal are managed and carried out using best management practices. A specific plan will be important if forestry removal occurs as part of the enabling works and therefore would not be covered as part of the Construction Environmental Management Plan produced for the main Project.

14 Ms Grant's evidence[4] states no detail has been provided on the level of treatment for the discharge of water from the concrete batching plant to the receiving environment. As discussed in the Assessment of Environmental Effects (*AEE*) (Section 8.3.1), the use of holding

[3] Paragraph 28.

[4] Paragraph 58.

tanks with multiple stages will allow any sediment to settle out in the first stage, and then chemical treatment will reduce pH to suitable levels for discharge if required. My recommendation is to re-use the treated water rather than discharge into the environment.

Evidence of Brian Handyside

15 In paragraph 33 of Mr Handyside's evidence, he discusses the use of access and haul roads and the sediment discharges generated from their use.

16 It is proposed that access tracks are used initially to transport heavy earthworks machinery to construction areas, and from there a haul road will be established within the earthwork footprint (along the route of the Main Alignment). The haul road will be restricted to within the earthwork footprint where erosion and sediment controls have already been established. The use of the access tracks will then be reduced to access and maintenance vehicles (Transpower and utility owners) and for farm operations. Accordingly, I expect the Project to require fewer access tracks than other projects, and for these to be only lightly trafficked.

17 Mr Handyside, in paragraph 35, states there is to be two years of enabling works prior to the six years of bulk earthworks and these works do not appear to have been included in the Project's sediment yield modelling.

18 I have provided to **Ms Malcolm** areas for the main earthworks and identified other areas of open earthworks as follows:

Table 1: Open earthwork activities

Activity	Area (approx)	Comment
Main earthworks	162ha	
Fill disposal site	11ha	
Forest harvesting (enabling)	10ha	Included in 162ha
Transpower Towers (enabling)	<1ha	Based on 24 new towers
Temporary culverts (enabling)	<1ha	55(number of)
Stream diversions	20ha	10km by 20m wide
Haul roads	28ha	Included in 162ha

19 In total, there will be about 195ha of open earthworks area and I understand from **Ms Malcolm** that she has assumed 210ha in her sediment yield modelling.

20 In the last bullet point of paragraph 42, Mr Handyside notes that unsuitable material from the Te Puka SSEMP is to be hauled off site to a dump site to be established further down the valley. He then goes onto say that the dump site and the use of haul roads have not been assessed for sediment generation.

21 There are no dump sites required within this section of Project. The topography constraints of the Te Puka valley limits the efficiency of removing quantities of material off-site and therefore the construction methodology used by the Project team has assumes that any unsuitable material will be re-used within the site.

22 The stream will be constructed progressively in short sections (as discussed in paragraph 44 of **Mr Gough's** EIC) and unsuitable material generated from the existing stream bed or from undercut areas will be re-used to fill areas along-side the new stream or for the proposed access track constructed at the base of the reinforced soil embankment.

23 Again, as stated in paragraph 16 above, the use of haul roads will be confined to within the earthwork footprint and is included in the total catchment area assumed by **Ms Malcolm** in the sediment modelling.

Evidence of Helen Kettles

24 In paragraph 65 of her evidence Ms Kettles states that despite Ration Creek being the catchment with the greatest area of open earthworks and active length of road, it is omitted from the peak construction areas used for event based modelling.

25 I have reviewed the staging graphs used in the staging scenario modelling and note that both Horokiri and Duck catchments have the larger area of earthworks open and length of road than shown in the Ration catchment. Although this is one staging scenario, I would expect that due to the rolling topography and better cut to fill balances over shorter sections that earthwork activities will be undertaken in shorter lengths and done progressively from the south and SH58.

26 In paragraph 66, Ms Kettles states that she is unclear as to the purpose of the staging plan and the duration of the peak construction scenario. I can confirm that the staging plans have been developed to identify a likely construction programme for the TGP and that the likely peak construction scenario would equate to the 16 month period between 1 June 2018 and 1 October 2019.

27 I would also comment that during this peak construction period the sequence of works would be staged such that earthworks in Ration and Duck catchments would run concurrently and would commence after earthworks in Horokiri and Pauatahanui have finished. This staging order[5] is slightly different to the staging scenario modelled by **Ms Malcolm**, however it still shows that construction in the Ration catchment would not be coincident with works in Horokiri and Pauatahanui catchments.

Evidence of Don Wignall

28 In Paragraph 4.11 of Mr Wignall's evidence he states that the introduction of a 'short' weaving section (less than 500m) is inconsistent with the design of other sections of the Road of National Significance (*RoNS*) in the corridor and more typical of major urban roads.

29 I disagree with this and note other typical examples of auxiliary lanes used within the Wellington Region. The Wellington Urban Motorway between Clifton Terrace and Tinakori Rd/Hawkestone St, has an auxiliary lane length of approximately 325m northbound and 250m in the southbound direction, both operating at 100km/h and have significantly more traffic weaving than the TGP is expected to have. In both of these cases neither speed management nor ramp metering has been used and there have been no reported safety problems related to weaving.

30 Mr Wignall then goes on to say in paragraph 4.12 that there is no specific NZ standard for weaving section design. He is correct that there is no specific standard, however Austroads Part 4C: Interchanges, and Austroads AGTM06[6]: Section 6.6.6, Ramp Spacing gives very good guidance on ramp spacing and warrant[7] for auxiliary lane use.

31 In Section 6.6.6 Table 6.4 gives a desirable distance required of 900m between a ramp entry followed by an exit for two lanes of traffic. It also states that in cases where such ramps are too close, an auxiliary lane between the ramps might be appropriate.

32 Where the spacing does not meet the desirable distance given in Section 6.6.6, analysis should be undertaken to check the Level of Service (*LOS*) in accordance with the Highway Capacity Manual

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5 Described in Appendix A of my EIC

6 Guide to Traffic Management, Part 6: Intersections, Interchanges and Crossings

7 A criterion, usually numerical and related to usage levels, used to determine whether the installation of a traffic control device can be justified.

(*HCM*). I have checked the LOS using the HCM worksheets and calculated a LOS of B[8] based on a weaving segment length of 500m.

33 The introduction of a parallel auxiliary lane was in response to the safety auditors' concerns about the short distance between the entry and exit ramps. The warrant of an auxiliary lane in accordance with Austroads Guideline stated above will, in my opinion, provide sufficient distance to accommodate weaving traffic with a good level of service.

34 This approach was recommended by the Safety Audit which was undertaken in October 2008 (Section 4.2.1) and stated:

> *"The 400m separation is shorter than desirable (preferably more than 500m). However the audit team feels that it is better to provide the proposed improved SH1 exit alignment comprising an auxiliary lane and an exit positioned on the tangent rather than to be too concerned by the slightly limited length for weaving."*

35 Additionally, the NZTA has also adopted the recommendation by the safety auditors (Section 4.2.2) to terminate the downhill crawler lane prior to the northbound entry ramp from Paekakariki. Although this has not been shown on the scheme drawings submitted for the notices of requirement, the road markings and shoulder hatching required will be included in the detail design.

36 In paragraph 4.15, Mr Wignall quotes from the safety audit undertaken in December 2007 in which it was noted that local traffic travelling between Paekakariki and MacKays Crossing will typically travel at lower speeds than traffic using the TG Project.

37 The final sentence of this safety audit statement (not quoted by Mr Wignall) then goes on to say that providing a third lane between Paekakariki and MacKays Crossing will reduce the potential for conflicts related to this issue. The Safety auditors then recommend an auxiliary lane is provided to cater for local traffic movements (as is proposed).

38 In paragraph 4.17 of his evidence, Mr Wignall's states that forecast traffic flows were not available to the auditors. The Feasibility Stage Audit Section 1, 5, 6, 7 and 9 dated December 2007: Appendix A included a list of documents provided to the safety audit team which includes various traffic volumes for options modelled.

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[8] Based on a performance measure that represents quantity of service, LOS A represents the best conditions from a traveller's perspective and LOS F the worst.

39 Mr Wignall suggests all traffic from Paekakariki use MacKays Crossing to access SH1. The safety audit specifically recommended against this, as it would require all northbound traffic to connect to the TGP/SH1 via the rail crossing. I agree with the auditors' concerns regarding use of the rail crossing.

40 In paragraph 4.20, Mr Wignall states that no measures are included in the current TG Proposal to transition speed for motorists leaving the main highway and linking to the existing SH1 coastal route. I agree no specific measures are detailed in the plans for the notices of requirement, however the safety auditors again recommended providing an urban roundabout located south of the Transmission Gully route underpass on SH1 to provide local road connection to SH1 and the opportunity for speed reduction prior to entering Paekakariki. This should be considered as part of a suite of measures for the treatment of the existing coastal highway.

Mark Alan Edwards
17 January 2012