

**Before Hearing Commissioners  
at Palmerston North**

**UNDER:** the resource management Act 1991

**IN THE MATTER OF:** an application for a **Notice of Requirement** by **New Zealand Transport Agency** to the Palmerston North City Council, Manawatu District Council and Tararua District Council for **E AHU A TŪRANGA MANAWATŪ TARARUA HIGHWAY.**

Summary evidence of Harold Victor Henderson on behalf of  
**AgResearch Ltd**

Dated XX March 2019

 **agresearch**  
*āta mātai, mātai whetū*

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*āta mātai, mātai whetū*

## **SUMMARY EVIDENCE OF HAROLD HENDERSON**

### **INTRODUCTION**

- 1 My name is Harold Henderson.
- 2 I prepared evidence dated 15 March 2019 for AgResearch Ltd in relation to the NZTA application for a designation associated with the **E AHU A TŪRANGA MANAWATŪ TARARUA HIGHWAY**
- 3 My qualification and experience are as outlined in that evidence.

### **SCOPE OF EVIDENCE**

- 4 This evidence provides a summary of the main points of my evidence as filed, where I provide my expert opinion on the effect that the proposed Project will have on future data and statistical analysis of the long-term phosphorus fertiliser and sheep grazing trial (the Trial).

### **SUMMARY OF EVIDENCE**

- 5 The Trial comprises four self-contained farmlets that were established in 1975. They cover three slope-classes and cover three aspects found in hill country. These provide a wide range of conditions that are typical of the dissected hill country of the North Island.
- 6 Within the Trial blocks, there are 72 permanent soil and pasture measurement sites that are used to track the changes of the different fertiliser regimes. These 72 sites have been the basis for monitoring since the long-term study was established in 1975.
- 7 Each farmlet has eighteen monitoring sites made up of two monitoring sites representing nine aspect and slope combinations.
- 8 Within the area of the designation are between 4 and 10 monitoring sites (22% to 56%) from each farmlet. It is not clear whether these will be permanently removed, due to the construction of the road corridor, or their conditions altered significantly because of their proximity to the road corridor. Either way there will be a significant and permanent adverse effect on the quality of the data. I refer you to Dr Brent Clothier for explanation on the effects of changing the hydrological regime of the sites.
- 9 In total it appears that twenty-five of the measurement sites (35%) will be lost or affected by the Project. This means that:
  - 9.1 Six aspect and slope combinations will no longer be represented (a loss of 12 monitoring sites); and

9.2 Thirteen combinations will only have one monitoring site instead of two.

- 10 The loss of or effect on 35% of the monitoring sites and in particular 67% of South-west aspect sites, will have permanent significant adverse effects on the statistical viability of future research from the Trial.

### **EXPERT CONFERENCING**

- 11 I attended expert conferencing on 22 March 2019 to identify, and discuss the effects on the long-term trial at Ballantrae research station.
- 12 I have signed a joint statement setting out the outcomes of the conferencing. I note that in that in this JWS all experts agreed that *"if the designation corridor was to remain in the same location the credibility of the ongoing/future data collected from the long-term systems trial would come to an end because of the disruption to the system and loss of permanent sites"*.
- 13 I further note that when posed the question *"A smaller corridor (i.e. reduce the number of sampling sites which are lost from approximately 25 to 15 of 72) would avoid some of the effects of road construction and location on the long-term systems trial to the extent that the trial integrity remains?"*, all experts disagreed – for a variety of reasons.
- 14 Alec Mackay has presented in his summary of evidence the key outcomes of the expert conferencing.

Dated: XXX March 2019

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Harold Henderson