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*under:* the Resource Management Act 1991

*in the matter of:* Proposed Plan Change 5 to the Canterbury Land and Water Regional Plan

*and:* **Barrhill Chertsey Irrigation Limited**

*Submitter* C16C/30978

*Further submitter* C16C/71901

## Statement of rebuttal evidence of **Eva Harris**

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Dated: 5 August 2016

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## REBUTTAL STATEMENT OF EVIDENCE OF EVA HARRIS

- 1 My name is Eva Harris.
- 2 I have already provided evidence dated 22 July 2016 on PC 5 on behalf of Barrhill.<sup>1</sup>
- 3 This rebuttal evidence is arranged around key themes coming out of others' evidence in chief, being that:
  - 3.1 The many issues that compromise the ability of OVERSEER® and the Farm Portal as regulatory tools able to support hard limits in PC 5 (*Modelling Issues*);
  - 3.2 Most notably of the Modelling Issues, the need to adopt improved irrigation and fertiliser proxy inputs for the Farm Portal;
  - 3.3 Modelling Issues creating the need for an "alternative pathway" for resource consents where farm systems cannot be reliably modelled;
  - 3.4 Inappropriate incorporation of "sinking lid" and unorthodox permitted provisions in PC 5;
  - 3.5 Incorporation of mahinga kai and other cultural values in PC 5; and
  - 3.6 Fish & Game's proposal for enhanced permitted activity monitoring.
- 4 I turn now to each of those matters.

### MODELLING ISSUES

- 5 A key point of my evidence in chief was to illustrate that for a large number of related reasons, the Farm Portal and OVERSEER® cannot currently be relied on to accurately model a farm system that is operating using good management practices (ie "at GMP"). It follows that neither model should (or can) be the only basis for hard (i.e. activity-status determining) limits in PC 5. At minimum, I consider an alternative pathway is required.
- 6 This insight is not new or novel, and for that reason I endorse the evidence of **Mr Stuart Ford** (*Horticulture New Zealand*), who pointed out that even the *developers* of OVERSEER® acknowledge the model's significant limitations in their published technical

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<sup>1</sup> All abbreviations I use in this evidence are the same as in my evidence in chief.

support material. **Mr Ford** has put that material before the Commissioners in evidence.

- 7 Causes of the Modelling Issues include the matters under the following headings.

#### **Nutrient budget preparation**

- 8 There is inconsistent preparation of nutrient budgets between individuals (even when working to the common Best Practice Data Input Standards (BPDISs)). I gave evidence of this in relation to Irrigo, and others have said the same about other organisations.
- 9 In my view, this inconsistency is difficult to avoid. **Dr Samuel Dennis** (*Beef + Lamb New Zealand*) put the reason for that bluntly when he said that OVERSEER® modelling "*involves judgement calls - particularly around the level of simplification to be applied. The Overseer Best Practice Data Input Standards do not say how to make these decisions, just limit the possible options.*"<sup>2</sup> I agree.

#### **OVERSEER® errors requiring workarounds**

- 10 The obvious points in this area are that high numbers of farms are likely to require workarounds, particularly on non-dairy farm systems (about 4000 or 80% of Canterbury farms). When workarounds are made, the model becomes less of a true reflection of the farm system. I trust that the depth of evidence given in this area by multiple witnesses makes the significance of workaround issues clear.
- 11 **Mr Matthew Cullen** (*Fonterra*) made a valuable point on this subject that I did not. He said that "*[a]lthough the process of manipulating the input data may not significantly affect the veracity of the OVERSEER nitrogen loss number, there are unknown implications of running that manipulated input file through the Farm Portal. It is likely that use of workarounds will distort the Portal generated good management practice loss rate*".<sup>3</sup>
- 12 I support **Mr Cullen's** point because there is no genuine evidence as to the effects of workarounds on Farm Portal outputs, and so no way of knowing the possible distortions. All we know is that, statistically speaking, some form of distortion is more likely than no distortion at all.

#### **OVERSEER® updates**

- 13 The fact that OVERSEER® updates increase workloads considerably and compromise comparability of budgets was the subject of much evidence in chief.

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<sup>2</sup> See evidence in chief of Dr Dennis at paragraph 8.

<sup>3</sup> See evidence in chief of Matthew Cullen at paragraph 6.1.

14 Given the difficulties presented by updates, I sympathise with calls to 'tie' certain methods to single versions of OVERSEER®, as for example **Mr Lionel Hume** (*Federated Farmers*) does in relation to "flexibility caps".<sup>4</sup>

15 However, I accept that updates are necessary and desirable in that they will improve the models over time. What requests like **Mr Hume's** really go to show, in Barrhill's view, is that OVERSEER® is just not ready to be treated in the way PC 5 treats it – like a measurement device. That is outside its current capability on all farm systems.

#### **Representing the 'baseline' accurately**

16 There are significant challenges in accurately representing the 'baseline' output.

17 I made the point that often full records were not often kept for 2009-2013 and that for technical reasons files bear less resemblance to baseline conditions over time.<sup>5</sup> Others, including for example **Dr Dennis**, made additional practical points about using a four-year average – illustrating why it will not always be appropriate to 'count' all years in the 'baseline period', as the Good Management Practice Loss Rate and Baseline GMP Loss Rates call for.<sup>6</sup>

#### **Irrigation and fertiliser proxy issues**

18 In Barrhill's view, the Farm Portal proxies were intended to, but do not, represent on-farm GMPs.

19 Both **Dr Bruce Thorrold** (*Dairy NZ*) and **Mr Andrew Curtis** (*Irrigation New Zealand*) give some of the background as to how this situation came to pass to when they discuss their organisation's dealings with the drafters of the proxies.<sup>7</sup>

20 **Mr Ian MacIndoe's** (*Irrigation New Zealand*) evidence is directed to showing why one of the key assumptions of the resulting irrigation proxy (deficit irrigation with 100% efficiency) is exceptional.<sup>8</sup> **Dr Alistair Metherell** (*Ravensdown*) shows that the expectations underlying the fertiliser proxy are similar.

21 My evidence is consistent with this in relation to Barrhill farms. **Mr Reuben Edkins** (*RDRML*) shows the same in relation to RDR

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<sup>4</sup> See for example the evidence of Mr Lionel Hume (*Federated Farmers*) at paragraph 37, where he is discussing "flexibility caps".

<sup>5</sup> See my evidence in chief, paragraph 104.

<sup>6</sup> See evidence in chief of Dr Dennis at paragraph 19, "Farm C".

<sup>7</sup> See the evidence in chief of Andrew Curtis at paragraphs 20 -30.

<sup>8</sup> See the evidence in chief of Mr Ian MacIndoe at paragraph 37.

Scheme farms. **Dr Dennis'** evidence shows the same in particular cases on pastoral and other farm system types.

- 22 On this subject, I notice that **Dr Thorrold** disagrees with a comment at paragraph 6.21 of the section 42A report that I said I agreed with.<sup>9</sup> This should not be taken to imply that I disagree with **Dr Thorrold**. Whereas I was emphasising that modelling ought to reflect reality, **Dr Thorrold** appears to be emphasising that in a situation where there is a model setting a single limit, and where the limit can be achieved in many ways, all those methods should be open. I agree with that interpretation of the officers' comments also.
- 23 Given all this, it should be clear in my view that the proxies generally yield Baseline GMP Loss Rates unrepresentative of GMP.
- 24 The function of others' evidence (**Dr Stewart Ledgard** and **Dr Thorrold**, and **Dr Metherell**) is that there is a better alternative for the fertiliser proxy at least, based on N-surplus.
- 25 Barrhill supports that alternative approach to the N fertiliser proxy for the reasons given by those witnesses, although supports exploration of different thresholds within those proxies.<sup>10</sup> However, in Barrhill's view it is essential that any alternative proxies proposed are calibrated against a variety of audited farm systems to ensure that the alternative proxies reflect GMP on-farm.

#### **THE NEED FOR AN ALTERNATIVE PATHWAY**

- 26 As **Mr Chris Hansen** (*Ravensdown*) points out, even where OVERSEER® and the Farm Portal accurately model some farm systems at GMP, there is still a need for an alternative pathway to obtain resource consents for farming activities. This is because (as my evidence demonstrates along with that of **Dr Dennis** and, for example, **Mr Vance Hodgson** of (*Horticulture New Zealand*)), the models remain incapable of accurately modelling all farm systems.
- 27 As I touched on in my evidence in chief, Barrhill supports the Fonterra and Ravensdown proposals for an alternative pathway as set out by **Mr Gerard Willis** (*Fonterra*) and **Mr Hansen**. While there are small differences in their drafting<sup>11</sup> Barrhill supports the essence of both mechanisms – which is essentially where the Farm Portal cannot deliver a Good Management Practice Loss Rate or Baseline GMP Loss Rate, a farmer should still be able to obtain a

<sup>9</sup> See paragraph 5.19 Dr Thorrold's evidence in chief and paragraph 53 of my evidence in chief.

<sup>10</sup> See the comment in the evidence in chief of Mr Dr Thorrold at paragraph 5.14.

<sup>11</sup> This is best shown at paragraph 47 of Mr Hansen's evidence in chief.

resource consent after the application of sensible judgement by a suitably qualified professional.

- 28 In Barrhill's view **Mr Willis's** and **Mr Hansen's** alternative pathway is generally preferable to the more exception-based approach of Horticulture New Zealand.

#### **INAPPROPRIATE INCORPORATION OF "SINKING LID" AND PERMITTED PROVISIONS IN PC 5**

- 29 Barrhill did not submit directly on "sinking lid" rules (but did have further submissions in relation to these provisions) - nevertheless, my evidence indicted a clear trend amongst Barrhill farms that even farms audited at a LOC for irrigation and fertiliser targets needed a mean N loss reduction of 29%. I still briefly comment on these rules in my evidence in reply as it provides context to a number of other points Barrhill has made. In this regard, **Mr Edkins** presented evidence of a mean 44% N loss reduction required on RDRML farms. **Dr Metherell** found similarly over a dataset of 52 farms of various type.<sup>12</sup> I merely comment that where the nitrogen baseline is less than the Baseline GMP Loss Rate, that will represent a farm at best management practice. In my view, an unfortunate consequence of a rule like that, therefore would be to take away the flexibility of BMP farms to adjust their farming systems, and it will be these BMP farms that are the most appropriate places to accommodate productions increase with minimal adverse environmental effects.
- 30 Policy 4.38AB appears to contain a policy that makes the "permitted baseline" an impermissible consideration in any resource consent for the use of land for a farming activity. Barrhill took issue with this in its original submission, and accordingly supports the evidence of **Mr Willis** against the inclusion of Policy 4.38AB.<sup>13</sup> It also supports his point that because the baseline can be disregarded in appropriate circumstances, then it would be open to ECan to disregard baseline effects in appropriate cases - i.e. rendering Policy 4.38AB redundant.

#### **MAHINGA KAI AND OTHER CULTURAL VALUES**

- 31 Some of the evidence called on behalf of Te Runanga o Ngai Tahu requests that the region-wide provisions of PC 5 incorporate mahinga kai and other cultural values. Ngai Tahu appears to call for two key mechanisms including:

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<sup>12</sup> See Dr Metherell's evidence at paragraphs 30 - 32.

<sup>13</sup> See Mr Willis' evidence in chief, paragraphs 4.9 - 4.11.

- 31.1 A mahinga kai target into Schedule 7;<sup>14</sup> and
- 31.2 A requirement for Accredited Farm Consultants and Certified Farm Environment Plan Auditors to complete "a course approved by Te Rūnanga o Ngāi Tahu."<sup>15</sup>
- 32 Barrhill is not opposed to the incorporation of mahinga kai values into Schedule 7, but does not agree that the target proposed by **Ms Treena Davidson** is certain enough to ensure that a farm's compliance could be determined at audit. Though I am not a planner, in this context I reiterate the comments of **Mr Hansen** for Ravensdown that there is a need in principle for certainty in plan provisions.<sup>16</sup>
- 33 Furthermore, on this issue, Barrhill takes the view that the other management targets already in Schedule 7 would be better places to incorporate mahinga kai values. For example, the *Management Area: Waterbody Management (wetlands, riparian areas, drains, rivers, lakes)* could be amended to refer to indigenous vegetation.
- 34 On the requirements for Accredited Farm Consultants and Certified Farm Environment Plan Auditors to complete cultural competency courses, again Barrhill is not opposed in principle. However, Barhill makes two comments:
- 34.1 First, clearly a plan providing that "a course" must be completed will be uncertain just as above;
- 34.2 Secondly, in my evidence in chief, I emphasised that one of the many issues with "operating" an OVERSEER®/Farm Portal-based regime like PC 5 is that the demands on relevantly qualified experts is high (and will only increase over time). In my view, this could only be exacerbated by adding a further qualification to the required list.
- 35 For those reasons Barrhill is of the view that cultural competency *requirements* should be either 'soft' (i.e. recommendations rather than formal requirements), or phased in over time, or both.

### PERMITTED ACTIVITY MONITORING

- 36 **Scott Pearson** and **Angela Christensen** (*North Canterbury and Central South Island Fish & Game Councils*) call for 'permitted activity monitoring' through an amendment to Policy 4.38B.

<sup>14</sup> See the evidence in chief of Gail Tewaru Tipa at paragraph 6.11.

<sup>15</sup> See evidence in chief of Treena Lee Davidson at paragraphs 4.6, 5.12 and 5.16.

<sup>16</sup> Evidence in chief of Chris Hansen, paragraph 5.

- 37 Barrhill agrees that monitoring will be an important element of the PC 5 regime, but does not agree that Fish & Game's proposal, focussed as it is on plans, and not their implementation, will be at all effective.

Dated: 5 August 2016

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Eva Harris