

**BEFORE THE CANTERBURY REGIONAL
COUNCIL**

UNDER The Environment
Canterbury (Temporary
Commissioners and
Improved Water
Management) Act 2010

AND

IN THE MATTER Submissions and Further
Submissions on
Proposed Plan Change 5
to the Canterbury Land
and Water Regional Plan

Evidence of **Rebecca Louise Hyde** on Behalf of
JG & LM Murchison (Submitter No 67179) and **JWK Hoban & Ors** (Submitter No
67198)

Dated: 21th July 2016

INTRODUCTION

- 1.1 My name is Rebecca Louise Hyde
- 1.2 I hold a Bachelor of Agriculture majoring in Farm Management from Lincoln University and I am a Certified Nutrient Management Advisor. I am a certified Farm Environment Plan Auditor for the Canterbury Region. I have been involved in the Hurunui-Waiiau Nutrient working group and now the North Canterbury Land Care Group. I am a Co-Opted member of the Northern South Island Beef and Lamb Farmer Council.
- 1.3 I have worked in the field of Nutrient Management for 9 years. I am currently employed by Ballance Agri-Nutrients (BAN) as the Team Leader for South Island Farm Sustainability Services; I have been in this role for 2 years. Prior to this I was an Area Sales Manager for 2 years covering the Upper South Island and a fertiliser sales rep for 5 years covering South and Mid Canterbury.
- 1.4 I am involved in my family farming business with my father and brother, David and James Hyde. We farm across 3 properties in the Scargill/ Greta Valley area. The home farm 'Inverloch' is located in Scargill. The back of the property boundaries the south bank of the Hurunui River. The property is a 1200 hectare dryland hill country sheep and beef farm. My father has farmed this property for 42 years. Our second property 'Hydowns' has been farmed by the Hyde family for 5 generations, we have owned this property since 2011. It boundaries the north bank of the Hurunui River. The property is a 780 hectare dryland hill country sheep and beef farm. Our third property is situated on Glendhu Road, Motunau. We have owned this property since 2013. The property is a 410 hectare dryland easy country sheep and beef farm.
- 1.5 We specialise in finishing prime lambs and beef cattle. We carry our own breeding flock of composite ewes and cattle. We purchase replacement cattle when needed otherwise we are a breeding and finishing operation. Our free draining soils and warm climate are ideal for this sort of stock, it is healthy stock country. We farm 15,000SU across the 3 properties. Each property plays a key role in the operation. 'Inverloch' is the main breeding and finishing unit, 'Hydowns' is primarily a breeding property with some cattle finish and Glendhu Road was acquired for its coastal climate which captures a higher rainfall. This allows lambs finishing.
- 1.6 Our Glendhu Road farm is located within the area affected by Plan Change 5. Under the current rules in the Canterbury Land and Water Regional Plan our farm is a permitted activity because our N losses are less than 20kg/ha/yr.
- 1.7 'Inverloch' and 'Hydowns' are located within the area covered by the Hurunui-Waiiau River Regional Plan. However we have submitted on Plan Change 5 because we are hoping that if a practical and sensible planning regime can be developed in Plan Change 5, that Environment

Canterbury will apply it to the Hurunui-Waiau catchments in due course. The issues we discuss in our evidence are typical of dry land farms/dry land farms with small areas of irrigation throughout Canterbury.

- 1.8 I am familiar with the Code of Conduct for Expert Witnesses in the Environment Court Practice Note (2011) and I have complied with it in preparing this evidence. The opinions expressed in my evidence are my own except where I have stated I have relied on the evidence other parties. I have not omitted any facts or material known to me which may influence the opinions I have expressed in this evidence.

2. SCOPE OF EVIDENCE

- 2.1 My evidence supports submissions made by JKW Hoban and Others, and JG & LMW Murchison on the following matters:

- (i) OVERSEER trends- correlations between N losses and area of winter grazing by cattle
- (ii) OVERSEER trends- correlations between N losses and area of irrigation
- (iii) Challenges with OVERSEER

- 2.2 Attached to my evidence is:

- Excel spreadsheet showing areas of winter grazing and % of farm in winter grazing – Attachment One

3. GENERAL COMMENTS:

- 3.1 My evidence on the following matters is due to my experience and understanding of modelling farm systems through OVERSEER. I believe that all farming activities should use either the industry agreed Good Management Practices where they are appropriate or other appropriate farm management programs to minimize the risk of N or P/sediment losses to water.

4. WINTER GRAZING BY CATTLE

- 4.1 There is a correlation between N losses and area of winter grazing by cattle on properties. Due to the size of sheep and beef farms, 20ha of winter grazing by cattle as currently included in PC5 is a small percentage of the farm. I have analysed 27 XML files across Canterbury for Sheep and Beef farms. Out of the 27 I have analysed 12 would have to apply for resource consent under PC5 as they have more than 20ha in fodder crop used for winter grazing of cattle,, yet only one farm has more than 10% of the property in winter crop grazed by cattle. The average N leaching

for this sample is 15kgN/ha. Based on my evidence, I believe using a percentage of the farm in fodder crop grazed by cattle as a second alternative to the 20ha rule would enable those larger properties which have more than 20ha of fodder crop for winter grazing but still have very low N loss estimates to be a permitted activity, but would capture the potentially higher N leaching operations. Based on my table in Attachment One if the area in winter grazing for cattle is no more than 10% of the property, this would be an appropriate alternative measure for those who cannot comply with the 20ha limit.

- 4.2 In making this statement I am also assuming there will be an amendment to the definition of winter grazing so that it will only capture cattle which are grazed intensively on fodder crops in the winter. As the definition currently reads it captures all cattle either grazed on fodder crops or fed supplements during winter. As outlined in the evidence of Dan Shand, in most cases livestock are fed supplements of hay and baleage in winter, including extensively grazed cattle.

5. AREA OF IRRIGATION

- 5.1 The management, type and use of irrigation vary significantly between operations. In my experience of modelling irrigated properties through OVERSEER, the management of irrigation is the biggest contributing factor to N loss on the property rather than the area of the property in irrigation. Soil type will determine the amount of drainage that will occur on a property. The land use of the property is also a factor eg dairy vs arable.
- 5.2 Irrigation on sheep and beef properties is typically used to ensure summer and winter fodder crops are established, stock can be finished to a saleable weight or supplementary feed can be made to be fed out at other times of the year. As the climate is often the most limiting factor to growth, small areas of irrigation (often less than 10% of the property) are installed. Irrigation on sheep & beef properties is often limited by the area of the farm suitable for irrigation, depending on the size of the farm this may be more than 50ha but very rarely would it exceed 10% of the total property.

6. CHALLENGES WITH OVERSEER

- 6.1 As per the OVERSEER website:

OVERSEER is a mathematical model that captures the complexity of nutrient cycling in a farm system to help farmers and growers understand the way nutrients flow through their farm.

- 6.2 Due to this complexity of modelling a biological system it can be challenging to get an accurate N loss to water. As versions of OVERSEER change so do the N loss numbers. This has caused frustration for farmers wanting to know their number. As companies are charging for

OVERSEER (including BAN) this is an extra cost to any farming business. If a farm operation hasn't changed there shouldn't be a need for an annual nutrient budget update. Updates due to version changes can take about 30-45 minutes per nutrient budget.

- 6.3 Sheep & Beef farms can be particularly challenging to model as there are differences in soil type, topography and crops grown. The time taken to complete a robust, fit for purpose nutrient budget can be 3-8 hours. Often there are 15-20 blocks in OVERSEER. Whilst it's important for a farmer to understand their impact on the environment, I don't think it's of benefit to anyone to have farmers undertaking repeated Overseer assessments when the farm system hasn't changed.

7. CONCLUSIONS:

- 7.1 There is a correlation between percentage of the property winter grazed by cattle and the N loss. The higher the percentage, the higher the N loss. Due to the size of sheep & beef properties 20ha is a low percentage of the farm. Therefore a multi-trigger system that offers a 10% threshold would be better suited.
- 7.2 In my experience of modelling irrigated properties through OVERSEER, the management of irrigation is the biggest contributing factor to N loss on the property rather than the area of the property in irrigation.
- 7.3 Farmers should not be required to update their completed nutrient budget with version changes on an annual basis.

Rebecca Louise Hyde

Canterbury Sheep & Beef Farms

Farm Name	Nb type	N/ha	P/ha	Total Crop
HWG work				
HWGFarm 1	2012/2013	6	0.4	37.7
HWGFarm 1	Improved	11	0.5	123
HWGFarm 1	Dairy Grazing	14	0.6	215
HWGFarm 2	2012/2013	8	0.5	13
HWGFarm 2	Improved	12	0.5	25
HWGFarm 2	Dairy Grazing	14	0.5	32.5
HWGFarm 3	Actual	10	0.9	19.9
HWGFarm 3	More N	13	0.8	40
HWGFarm 3	Dairy Heifers	22	0.8	74.5
HWGFarm 4	Actual	6	0.1	39
HWGFarm 4	Lucerne	8	0.1	39
HWGFarm 4	Dairy Grazing	11	0.1	39
SFF work				
Farm 10	S& B & DG	7	0.1	46
Farm 9	sheep	14	0.2	0
Farm 8	S & B	20	0.5	44
Farm 7	Sh, Bulls, DG	18	0.5	30
Farm 6	S, b , Deer	24	0.3	21.5
Farm 4	S& B & DG, Dee	23	0.4	134
Farm 3	S& B & DG	46	0.4	84
Farm 2	S& B & DG	12	0.7	51
Farm 1	S, b , Deer	14	0.3	43
Sheep & Beef Farms				
Farm 1	S & B	17	1.5	28
Farm 2	S & B	15	0.9	52
Farm 3	S & B	16	0.3	0
Farm 4	S, b , Deer	15	0.2	105
Farm 5	S, b , Deer	20	0.2	230.3
Farm 6	S & B	11	0.7	30
AVERAGE N LOSS		15		

Crop grazed by winter cattle	Total Farm Ha
13.7 (turnips)	6947.7
100 (turnips)	6947.7
115 (Kale)	6947.7
	550
	550
32.2(kale)	550
	466
	466
	466
	535
	535
39(kale)	535
23 (rape)	600
	300
14 (rape)	598
	572
	0
1.3 (FB) 7.5 (Rape)	660
20 (Kale) 2.1(FB) 15 (Rape)	970
10 (kale) 3.5 (Rape)	296
22.7 (Kale) 4.2 (Swede) 8(FB)	1450
13 (Kale)	611
18 (Kale) 10 (FB)	2450
22 (Kale) 30(Rape)	2750
	774
32.5 (Kale)	2000
14 (kale) 8.8 (Swedes) 34 (GF oats)	1850
	2600

Comments

Turnips entered as crop block, leaching 274kgN/ha. Rape grazed by sheep, 229kgN/ha
Same as comments above. Turnips contributing to 42% of total N loss from farm.
Kale grazed by 2000 dairy cows and turnips all grazed by sheep.

13ha summer rape grazed by sheep
25ha summer rape grazed by sheep, 80ha of lucerne added
32.5ha of kale grazed by 600 dairy cows june/july

19.9ha of rape grazed dec jan by cattle
40ha rape grazed Dec -march by cattle, extra N fert applied.
All rape is grazed Dec-March, cattle gone end of april.

Soils not updated as not covered by smap 6ha lucerne cut and carry, rape summer grazed
50ha of grazed lucerne added , rape summer grazed by lambs
6ha lucerne C & C, 39ha of kale for winter grazing included.

Sheep and Cattle 50/50 graze the winter crops
30ha irrigated
Sheep and Cattle 50/50 graze the winter crops
All winter grazing is done by sheep.
Sheep and Cattle 50/50 graze the winter crops, Deer & cattle 80/20 on FB.
85/15 Deer/Cattle n FB, 100% Cattle on Kale, 70/30 Sheep/Cattle on rape. 100% sheep on GF oats
Sheep & Cattle grazing at different ratio's, have split out to %
Sheep & Cattle grazing at different ratio's, have split out to %
Kale 100% grazed by Cattle

High P loss due to large area of hill country in high rainfall

High N loss going from high country in higher rainfall.
Kale grazed 50/50 sheep/cattle
56.8ha wintered grazed by cattle
all grazed by sheep

PC5 consent % of Farm (total crop)

N	0.2
Y	1.4
Y	1.7
N	0.0
N	0.0
Y	5.9
N	4.3 * These are all summer grazed
N	8.6 * These are all summer grazed
N	16.0 * These are all summer grazed
N	
N	
Y	7.3
Y	3.8
N	0.0
N	2.3
N	0.0
N	1.3
Y	12.5
N	4.6
Y	2.4
N	2.1
Y	0.7
Y	1.9
N	0.0
Y	1.6
Y	3.0
N	0.0