

**BEFORE THE CANTERBURY REGIONAL COUNCIL**

**IN THE MATTER** the Resource Management Act 1991 (“the Act” or  
**OF** “RMA”)

**AND**

**IN THE MATTER** Proposed Land and Water Regional Plan (“PLWRP”)  
**OF**

**BETWEEN** **LINCOLN UNIVERSITY AND NEW ZEALAND  
INSTITUTE FOR PLANT AND FOOD RESEARCH**

Submitters

**AND** **CANTERBURY REGIONAL COUNCIL**

Regional Authority

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**STATEMENT OF EVIDENCE OF KATHERINE MCKENZIE**

**2 APRIL 2013**

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## INTRODUCTION

- 1 My full name is Katherine McKenzie, but I am commonly known as Kate. I hold a Bachelor of Arts (Geography) from the University of Canterbury and have been an Associate Member of the NZPI for 2 years. I am a Consultant Planner for Resource Management Group Ltd (RMG), a Christchurch-based resource and environmental management firm.
- 2 I have five and a half years of experience in resource management planning in New Zealand. The majority of this time was spent working at Grey District Council as a Consents Planner. My experience there included processing land use and subdivision resource consent applications, notices of requirement and various other planning related applications. I was also required to provide resource management advice to councillors, senior Council staff members and the general public.
- 3 I have been employed at RMG Ltd as a Consultant Planner since February 2012. During the course of my employment I have been involved in the preparation of resource consent applications, notices of requirement and submissions on planning documents; and the provision of resource management advice to clients.

## SCOPE OF EVIDENCE AND SUBMISSIONS SUMMARY

- 4 My evidence addresses the submissions of Lincoln University and the New Zealand Institute for Plant and Food Research Limited (Plant and Food) on the Proposed Land and Water Regional Plan (PLWRP). I have assumed that the Commissioners are familiar with the detail of the submissions and therefore, rather than repeating them in full, I have summarised the key areas in Table One below.

Chapter/Topic	Relevant Provision	Submission	Paragraph Reference
Rural Research Activities	New Definition – Section 2.10	• Define rural research activities	• 10
Farming	New Definition – Section 2.10	• Define farming activities and	• 10

		exclude rural research activities	
Changed	Definition – Section 2.10	<ul style="list-style-type: none"> <li>• Increase percentage change to match Overseer’s margin of error</li> </ul>	<ul style="list-style-type: none"> <li>• 21</li> </ul>
Change to Farming Activity	Rule 5.42	<ul style="list-style-type: none"> <li>• Permit changes to farming activities on non-irrigated land</li> </ul>	<ul style="list-style-type: none"> <li>• 23</li> </ul>
Offal pits	Rule 5.29	<ul style="list-style-type: none"> <li>• Amend rule to allow offal pits on a per 100 ha basis rather than a per site basis.</li> </ul>	<ul style="list-style-type: none"> <li>• 29</li> </ul>
Stock holding areas	Rule 5.35	<ul style="list-style-type: none"> <li>• Amend rule to apply to new stock holding areas only</li> </ul>	<ul style="list-style-type: none"> <li>• 33</li> </ul>

5 I have structured my evidence around the above issues, and in doing so, have considered the section 42a report and the evidence prepared by Dr Bill Griffin, and supplementary information supplied by Lincoln University which is attached to this evidence as **Appendix I**.

## PLANNING AND STATUTORY CONTEXT

6 I am sure that the Commissioners have received evidence and extensive legal submissions on the statutory framework applicable to this proposed Plan and the planning context in which it should be considered. I do not propose to repeat a detailed discussion here on those matters.

7 I will comment, however, that in my view Lincoln University and Plant and Food are of local, regional and national importance in terms of their research and education functions.

- 8 Proposed Change 1 to the Canterbury Regional Policy Statement (CRPS) dealing with the development of Greater Christchurch, which was intended to become Chapter 6 of the operative CRPS 2013, recognises “agricultural research establishments” in a number of objectives and policies. Protection is given to these facilities through policies which manage development to not give rise to significant reverse sensitivity effects when considering development options for Greater Christchurch. I note that proposed Plan Change 1 is likely to be surpassed by the proposed Land Use Recovery Plan (“LURP”), however it is presently still a ‘live’ planning document. A draft LURP has recently been released for public comment. The fact that the CRPS specifically seeks to ensure the uninterrupted operation of these facilities indicates that they are of at least regional importance.
- 9 The submissions which Lincoln University and Plant and Food made in relation to the farming provisions of the PLWRP requested changes to some provisions which would apply to all farming activities generally, but also most importantly, seek an exemption for rural research activities from the nutrient management provisions.

## **THE ISSUES**

### Rural Research Activities and Nutrient Management Requirements

#### *Proposed New Definitions: Farming Activity and Rural Research Activity*

- 10 The PLWRP introduces a number of nutrient management rules, which relate to farming activities, however no definition of farming activities is provided.
- 11 Lincoln University and Plant and Food Research carry out rural research activities across Canterbury. These rural research activities assist in the development of new best practice farming techniques across a broad spectrum of different farming activities, and as such, these research activities have a significant role, both in the region and nationwide. Both organisations are also heavily involved in the production of the industry guidelines which are proposed to be implemented through the inclusion of Schedule 8 at a later date.
- 12 Both organisations submitted on the nutrient management rules, on the basis that Overseer™ could not be practically applied to their research activities. There is particular difficulty in applying such modelling to a research farm

situation due to the high number of small trial plots typically used – compared to large scale extensive cropping in a productive farm situation.

- 13 The relief sought was to include a definition of farming activities, which specifically excluded rural research activities; and also to include a definition of rural research activities. The organisations provided suggested wording for these definitions. The relief sought would have the effect of exempting rural research activities from having to comply with Rules 5.39-54. The officer’s report has not commented specifically on the relief sought, so it is unclear exactly why this request has not been supported.
- 14 The officer’s report has recommended some significant changes to the rule regime which appears to make the rules more permissive. However Lincoln University and Plant and Food Research are carrying out what would be considered “high nutrient risk farming activities”, and are therefore required to prepare a farm environment plan as their research farms are primarily within the Red Nutrient Allocation Zone. One of the farm environment plan requirements is that a nutrient budget is prepared, using Overseer™ or another similar nutrient budget model. Therefore, Lincoln University and Plant and Food’s concern about applying Overseer™ is not addressed by the officer’s recommended changes. The evidence prepared by Dr Griffin demonstrates that any nutrient budget model would be difficult to implement on a research farm, due to the high number of individual trial plots which could each have to be put into a nutrient budget model in order to determine nutrient loss for the property. The supplementary information provided by Lincoln University (**Appendix I**) outlines the nature of research activities being carried out by the University. The University carries out a broader range of rural research activities than Plant and Food Research, however the evidence of Dr Griffin is equally applicable to the University’s activities, which also include a large number of small trial plots.
- 15 Dr Griffin’s evidence suggests that it may be feasible to implement a nutrient budget model for a research farm if it was acceptable to average the application of fertiliser, irrigation and other inputs over a number of trial plots, rather than having to input data from each plot separately. The farm environment plan states that a nutrient budget model must be prepared for each of the “identified land management units”.

16 Rural research activities, by their very nature, are already subject to a considerable amount of scrutiny. Inputs and outputs are carefully monitored for each individual trial plot, and soil quality monitoring is also carried out. Information required to be provided in the form of a farm environment plan is already generated as part of the research activities, although not necessarily in this format. I therefore consider it unnecessary to require rural research activities to submit a farm environment plan annually to be audited. For this reason, I agree with the relief sought by Lincoln University and Plant and Food Research, and consider that excluding rural research activities from the definition of a farming activity as a method of exempting these activities from the nutrient management rules is appropriate.

17 The officer's recommendations include definitions of existing farming activities and new farming activities. These definitions are a simpler version of the definition of farming activity put forward by Lincoln University and Plant and Food, however it would still include rural research activities. I therefore consider it necessary to amend these definitions to exclude rural research activities, and include a further definition of rural research activities as requested in Lincoln University and Plant and Food's submission. The proposed amendments are as follows:

*"Existing farming activity means the use of land for primary production (excluding forestry) that is not a "changed farming activity", and excludes rural research activities.*

*"New farming activity means the use of land for primary production (excluding forestry) where no primary production has occurred on that land in the previous three years, and excludes rural research activities.*

*"Rural research activities means the use of land primarily for the purpose of scientific research, inquiry or investigation, product development and testing, and consultancy and marketing of research information; and includes research related farming activities."*

18 As the officer's report did not comment on why the relief sought was not accepted, it is not possible to determine the reasons it has been left out of the recommended changes. If however, it is not considered appropriate to exempt these activities from providing a farm environment plan, a possible alternative method of addressing the organisations' concerns would be to still require rural research activities to prepare a farm environment plan, but clearly exempt these organisations from having to prepare a nutrient budget for their activities. I believe this could be achieved by amending schedule 7 as follows:

*“Part B Farm Environment Plan Default Content*

...

*7. Nutrient budget models are prepared by a suitable qualified person using a nutrient budget model, (such as Overseer™), for each of the identified land management units and the overall farm. Rural research activities are not required to prepare a nutrient budget model as part of their farm environment plan.”*

- 19 Another possible alternative would be to provide clarification that averages are able to be used for each land management unit, rather than per individual trial plot in the case of research activities.
- 20 While these alternative methods would address Lincoln University and Plant and Food’s original concern about implementing nutrient budgets for rural research activities, it would still subject these organisations to having to prepare a farm environment plan, which was not required in the notified version of the PLWRP. In my opinion, this is unnecessary for rural research activities, as they already carry out detailed monitoring of inputs and outputs for each trial as part of the research process. The preparation of a farm environment plan for rural research activities (and in particular a nutrient budget) would not result in any meaningful information being generated. I believe that the most appropriate method of addressing these organisations’ concerns is to exclude them from being considered a farming activity under this proposed Plan. These organisations, through their scientific research and development studies, contribute significantly to improving practices to minimise the environmental impact of the farming industry, and should not be impeded by imposing unnecessary restrictions and rules on these activities.

### Changes to Farming Activities

#### *Changed - Definition*

- 21 Lincoln University sought changes to the definition of “Changed” in the pLWRP. The definition of Changed relied on an increase in irrigation; or a 10% increase in nitrogen loss calculated using Overseer™, however did not recognise the high margin of error associated with this nutrient budget model. No specific amendments to the definition were provided.
- 22 The officer’s recommendation was to alter this definition to refer to a percentage increase in stock units or arable yield. The move away from

relying on Overseer™ is considered to be appropriate, given the other recommendations in the report surrounding the farming rules. I consider the averaging of stock units and arable yield over three years is also appropriate, as it will allow for variation in these quantities over three years with different climatic conditions, market demand etc. Overall, I consider the proposed changes to the definition to be appropriate, and support the officer's recommendation.

#### *Rule 4.42 – Changes to Farming Activities*

- 23 Lincoln University submitted on Rule 5.42, which manages changes to farming activities. The basis of the submission was that changes to farming activities were not permitted unless the land owner held a water permit which is subject to conditions specifying the maximum amount of nitrogen loss. No specific wording was provided, but the relief sought was to include a permitted activity status for farms that did not have a water permit as required by condition 1 of the rule, until such time as the new industry standards are implemented by the insertion of Schedule 8.
- 24 The officer's report contains sweeping changes to the farming rules, including that there are no longer pre2017 and post 2017 rules. Changes to farming activities are now captured by Rules 5.39, 5.44, 5.45, 5.46 and 5.47. The effect of the recommended changes is to make all changed farming activities within the Red Nutrient Allocation Zone (which covers the majority of the University's landholdings) a discretionary activity, which is more onerous than the rules which were notified.
- 25 The recommended changes to the farming rules make existing farming activities in the Red Nutrient Allocation Zone a permitted activity, subject to the preparation of a Farm Environment Plan. These changes also require the Farm Environment Plans to be audited and to achieve a grade A-B or better. In order to achieve these grades, it is assumed that a farm would have to be operated in accordance with industry best practice, to minimise adverse environmental effects.
- 26 While I am supportive of the proposed changes to this section of the plan in general, I question whether it is appropriate that existing farming activities would be permitted in the Red zone, and changed activities would not be.



27 I am of the opinion that changes to farming activities should be permitted, subject to the same rules as existing farming activities. If a farm is being operated in a manner which is capable of achieving an audit grade of A-B or better, then the leaching of nitrogen and other nutrients beyond the root zone should be minimal. This would indicate that the adverse effects of the activity are less than minor, and more importantly, no different whether the activity is existing or changed in some way.

28 Generally I support the inclusion of the new rule framework contained in the officer's report, with amendments. I consider rules 5.44, 5.45 and 5.46 are unnecessary and should be removed, and the requirements for changed and new farming activities should be incorporated into rules 5.40, 5.41, 5.42 and 5.43, as they relate to each Nutrient Allocation Zone. The amendments are shown below:

*5.39 The use of land for an existing farming activity, a changed farming activity or a new farming activity is a permitted activity provided the following conditions are met:*

*1. If the land is not in a Lake Zone as shown on the Series A Planning Maps and:*

*(a) the area of the property is less than 5 ha; or*

*(b) the area of the property is more than 5 ha and less than 50 ha and there is no high nutrient risk farming activity occurring on the property.*

*2. If the land is in a Lake Zone as shown on the Series A Planning Maps and:*

*(a) the area of the property is less than 5 ha; and*

*(b) there is no high nutrient risk farming activity occurring on the land.*

*5.40 The use of land for an existing farming activity, a changed farming activity or a new farming activity that is not permitted by Rule 5.39 in an area coloured Orange, Green or Pale Blue on the Series A Planning Maps is a permitted activity provided the following conditions are met:*

*1. Information on the farming activity, in accordance with Schedule 7 Part D is provided to the Canterbury Regional Council.*

*5.41 The use of land for an existing farming activity, a changed farming activity or a new farming activity that is not permitted by Rule 5.39, where the property is partly or wholly in an area coloured Red on the Series A Planning Maps, is a permitted activity provided the following conditions are met:*

*1. If there is no high nutrient risk farming activity occurring on the property, information on the farming activity, in accordance with Schedule 7 Part D is provided to the Canterbury Regional Council.*

*2. If there is high nutrient risk farming activity occurring on the property, then a farm environment plan is prepared and audited in accordance with Schedule 7 Parts A and C and the audit grade is "A-B" or better.*

*5.42 The use of land for an existing farming activity, a changed farming activity or a new farming activity that is not permitted by Rule 5.39, where the property is partly or wholly in a Lake Zone as shown on the Series A Planning Maps, is a permitted activity provided the following conditions is met:*

*1. There is no high nutrient risk activity occurring on the land; and*

*2. A farm environment plan is prepared and audited in accordance with Schedule 7 Parts A and C and the audit grade is "A-B" or better.*

5.43 The use of land for an existing farming activity, a changed farming activity or a new farming activity, where the property is partly or wholly in a Lake Zone as shown on the Series A Planning Maps and there is a high nutrient risk farming activity occurring on that part of the property within the Lake Zone, is a restricted discretionary activity provided the following conditions is met:

1. A farm environment plan is prepared, implemented and audited in accordance with Schedule 7 Parts A and C.

The CRC will restrict the exercise of discretion to the following matters:

1. The content of, compliance with, and auditing of the Farm Environment Plan;
2. The potential effects of the land use on surface and groundwater quality, and sources of drinking water;
3. The contribution of nutrients from the proposed activity to the nutrient allocation status of the management zone.
4. The extent to which the proposed activity will prevent or compromise the attainment of the environmental outcomes sought by, or is inconsistent with, the objectives and policies of this Plan relating to nutrient management and water quality.

~~5.44 The use of land for a changed or new farming activity that is not permitted by Rule 5.39, where the property is wholly in an area coloured Green or Pale Blue on the Series A Planning Maps, is a permitted activity provided the following condition is met:~~

~~1. Information on the farming activity, in accordance with Schedule 7 Part D is provided to the Canterbury Regional Council.~~

~~5.45 The use of land for a changed farming activity or a new farming activity, where the property is partly or wholly in an area coloured Orange on the Series A Planning Maps, is a restricted discretionary activity provided the following condition is met:~~

~~1. A farm environment plan is prepared, implemented and audited in accordance with Schedule 7 Parts A and C.~~

~~The CRC will restrict the exercise of discretion to the following matters:~~

- ~~1. The content of, compliance with, and auditing of the Farm Environment Plan;~~
- ~~2. The potential effects of the land use on surface and groundwater quality, and sources of drinking water;~~
- ~~3. The contribution of nutrients from the proposed activity to the nutrient allocation status of the management zone.~~
- ~~4. The extent to which the proposed activity will prevent or compromise the attainment of the environmental outcomes sought by, or is inconsistent with, the objectives and policies of this Plan relating to nutrient management and water quality.~~

~~5.46 The use of land for a changed farming activity or a new farming activity, where the property is partly or wholly in a Lake Zone as shown on the Series A Planning Maps or coloured Red on the Series A Planning Maps is a discretionary activity.~~

5.47 The use of land for an existing farming activity, a changed farming activity or a new farming activity that does not meet the relevant conditions of Rules 5.39 to 5.45~~3~~ or is not classified by Rules 5.39 to 5.45~~3~~ is a discretionary activity.

5.50 The discharge of nutrients onto or into land in circumstances that may result in a contaminant entering water that would otherwise contravene s15(1) of the RMA is a permitted activity, provided the following condition is met:

1. The land use activity associated with the discharge is authorised under Rules 5.39 to 5.46~~3~~

5.51 The discharge of nutrients onto or into land in circumstances that may result in a contaminant entering water that would otherwise contravene s15(1) of the RMA and does not meet the condition in Rule 5.50 is a non-complying activity.

## Offal Pits

### *Rule 5.29 – Use of land for offal pits*

- 29 The PLWRP seeks to control the use of land and discharges associated with offal pits on farms. The proposed plan provided for offal pits as a permitted activity, provided certain conditions were met. Lincoln University submitted on the rules, to seek a change that would limit the total volume of offal pits per 100ha of land, rather than setting a limit of one offal pit per site per annum.
- 30 The officer's report has only partially adopted the relief sought by Lincoln University, and this has resulted in the University's concerns not fully being addressed. The University currently operates multiple smaller offal pits around their research farms, rather than one large offal pit per annum. The relief sought was to allow multiple offal pits per 100ha of land with a total volume of 50m<sup>3</sup>, and the recommendation by the officer was to allow one offal pit of 50m<sup>3</sup> per annum.
- 31 It is my opinion that the relief sought by Lincoln University is an appropriate, effects based method of managing the discharges from offal pits. The relief sought would permit the same volume (and therefore the same amount of discharge) over the same land area of 100 hectares. Allowing multiple smaller pits per annum would distribute the discharges more evenly over the area, rather than having a concentrated discharge point. All other conditions of the rule would still have to be complied with, which minimise the potential for adverse effects associated with the discharges.
- 32 The recommended changes in the officer's report do not reflect the relief sought by Lincoln University, even though the change to condition 3 is referenced as being requested by the University. I believe the changes sought by Lincoln University should be adopted, as follows:

*"5.29 The use of land for an offal pit and the associated discharges onto or into land in circumstances where a contaminant may enter water are permitted activities provided the following conditions are met:*

*1. The discharge is to ~~a~~ pits that:*

*(a) haves a total volume of less than 50 m<sup>3</sup> per 100 hectares per annum;*

(b) are is sited and designed to prevent surface runoff entering the pits; and

(c) are is designed to prevent animals from gaining access to the pits; and

2. The discharge is only of dead animals or animal parts produced on the site where the pits are is located;

3. ~~No more than one pit is constructed or used per site per annum;...~~

### Stock Holding Areas

#### Rule 5.35 – Use of land for stock holding areas

33 The pLWRP introduces rules relating to the use of land for, and associated discharges from, stock holding areas. The proposed Plan, as notified, would require all stock holding areas to obtain a resource consent. Lincoln University sought a change to this rule, which would permit the use of land for stock holding areas, when an individual or company already holds a discharge permit for the discharge of contaminants from the stock holding area. For example, lawfully established milking sheds which already hold a discharge permit for the discharge of animal effluent to land would now be required to obtain a land use consent for the activity as well. Lincoln University did not believe it was necessary to control the use of land for these activities, when the actual effects of the land use (the discharge) were already controlled by way of a discharge permit.

34 There were extensive submissions on these rules, and the officer's report has now recommended changes to the rules which introduce a permitted activity regime for both land use and the associated discharges from stock holding areas, which Lincoln University supports. However, the officer's recommendations do not fully acknowledge the issue that Lincoln University raised in their submission, which is to recognise existing discharge permits.

35 The recommended amendments to the rules now permit stock holding areas, provided that the discharge is authorised by Rules 5.35B to 5.36B (I note that there does not appear to be a Rule 5.35B in the officer's report recommended set of rules). If a discharge permit already exists, then it would not be authorised by these rules; it would be authorised by the discharge permit. I consider that a further amendment to these rules is necessary to ensure that a land use consent is not triggered where a discharge permit already exists. I suggest the following amendment to the officer's report version of Rule 5.35:

*"5.35 The use of land for a stock holding area is a permitted activity, provided the following conditions are met: ...*

*...2. All liquid animal effluent, washdown water or stormwater containing animal effluent is collected and disposed of to an animal effluent collection and storage system authorised under Rules 5.35B to 5.36B or under an existing discharge permit.*

## **SUMMARY AND CONCLUSIONS**

36 My evidence addresses a range of issues relevant to Lincoln University and the New Zealand Institute of Plant and Food Research Limited.

37 The matters which are of particular interest to these organisations can be broadly summarised as follows:

- New definitions have been sought, for farming and rural research activities, to exempt rural research activities from the nutrient management rules proposed to be implanted for farming activities. The requirement to prepare a nutrient budget model for rural research activities has been demonstrated by supplementary evidence prepared by Dr Bill Griffin to be a particularly onerous task which would not result in any meaningful information being generated.
- Lincoln University submitted on the definition of “changed” and the associated Rule 5.42, which only permitted changes to farming activities where there was an existing water permit which addressed nutrient losses in consent conditions.
- Changes were sought by Lincoln University to permit multiple smaller offal pits in Rule 5.29, rather than one single large offal pit per property, and limit the total volume to 50m<sup>3</sup> per 100ha of land, rather than per property.
- Changes were also sought by Lincoln University to permit existing stock holding areas under Rule 5.35 where a discharge permit had already been obtained.

38 Overall, I consider the relief sought by Lincoln University and Plant and Food will assist in achieving the PLWRP’s desired resource management outcome of integrated land and water management in Canterbury, and agree with the amendments requested by these organisations.

Katherine McKenzie

Consultant Planner  
**Resource Management Group Ltd**

2 April 2013

## **Appendix I – Description of Lincoln University’s Rural Research Activities**

## **Lincoln University – Rural Research Activities**

Lincoln University, Te Whare Wanaka o Aoraki, New Zealand's specialist land based university currently has its main campus at Lincoln with the Telford Division located in Balclutha.

Lincoln University specialises in research and education in agriculture and the physical and biological sciences, complemented by the integration of international commerce, environmental management and social sciences.

The student head count<sup>i</sup> on the Lincoln campus is 3,187 and comprises of 358 research PhD and Masters degrees, 352 taught graduate diplomas through to masters, 1,696 bachelors and 781 sub degree.

Lincoln University conducts extensive plot trial, farmlet and systems research covering animals, crops, forages and pastures and the integration of these at the whole farm system level on a number of (primarily) owned facilities adjacent to the Lincoln campus. These include;

- Lincoln University Dairy Farm, 180ha
- Lincoln University Research Dairy Farm 55ha
- Kowhai Organic Farm 35ha
- Research Farm 55ha
- Horticultural Research Area 20ha
- Biological Husbandry Unit 10ha
- Iversen Field 20ha
- Arable Farm 125ha(Currently leased to Plant & Food Research)
- Ashley Dene Research Farm 355ha (12km west from the Lincoln campus)

Other outlying facilities include;

- Deep Stream 92ha, on the south bank for the Rangitata river
- Silverwood 418ha (leased), near Hororata
- Mt Grand 2,125ha at Lake Hawea
- Arglye 433ha in the Wairau Valley, Blenheim

Research from these facilities can also contribute to improved practice within the local catchment.

### **Lincoln University Dairy Farm (LUDF)**

The LUDF Strategic Objective for the 2011-2015 period is:

“To maximise sustainable profit embracing the whole farm system through:

- increasing productivity;
  - without increasing the farm's total environmental footprint;
-



- while operating within definable and acceptable animal welfare targets; and
- remaining relevant to Canterbury (and South Island) dairy farmers by demonstrating practices achievable by leading and progressive farmers.
- LUDF is to accept a higher level of risk (than may be acceptable to many farmers) in the initial or transition phase of this project.”

This demonstrates the University’s commitment to carrying out research to increase productivity without adverse environmental outcomes.

### **Nutrient Loss Models**

The scope, duration and complexity of the research undertaken by Lincoln University potentially makes inputting of data complex and probably irrelevant at the treatment or plot level if using models such as Overseer to describe nutrient losses per land unit. As a long term annual average model, Overseer would more accurately describe losses from Lincoln Universities research and farming activities if aggregated input and output data was used to predict the total losses across a combined land area (such as the Research Dairy Farm, or the Lincoln University Campus farm areas). Lincoln University’s research activities are typically short term (1-5 years) and will in some cases generate higher losses than occur on commercial farms due to a range of research treatments (research that is required to contribute to nutrient models and better understanding of nutrient losses).

Research ranges from short term undergraduate student programs to long term commercial and industry good projects such as the P21 Farmllet research at both the Lincoln University Research Dairy Farm and Ashley Dene properties. Student projects may not be determined until students begin the year’s classes and could include high rates of fertiliser than the particular block of land received in the past – triggering the change in stock units or arable yield or a change in land use. The P21 research is a five year project with a specific goal of producing near farm ready results that maintain productivity while holding or reducing nutrient losses. It is undesirable for research to be unduly constrained by the PLWRP.

### **Offal Pits**

Lincoln University’s current practice is to operate multiple smaller offal pits, which cumulatively do not exceed 50m<sup>3</sup> per 100ha of land per annum. The proposed rules would not allow this practice to continue.

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<sup>i</sup> Lincoln University Annual Report 2011