BEFORE INDEPENDENT HEARING COMMISSIONERS

IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of the hearing of submissions on Proposed Variation 2 (Hinds Plain) to the Proposed Canterbury Land and Water Regional Plan

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BRIEF OF EVIDENCE OF PHILLIP GRAHAM EVEREST

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Introduction

1 I am currently a director of Mayfield Hinds Irrigation Limited (**MHIL**).

2 I am a shareholder in Riverbank Farm (Ashburton) Ltd which has been a dairy unit for over 25 years and milks 700-750 cows on 210ha.

3 We are also shareholders in Broadfields farm which is a dairy support unit for four local dairy farms. With my wife, we own a 277ha property at Flemington that milks 750 cows on a 215ha dairy platform, and the balance runs as dairy support.

4 My wife and I converted our 270ha property at Flemington from arable and beef finishing to a 750 cow dairy farm in 2011. The development not only included the construction of the milking shed and associated buildings and lanes, but also included an upgrade of irrigation to pivots, installation of an effluent system (which provides storage 16 times greater than the consenting requirements) use of 'green water' to wash the dairy yard (conserving water) and an effluent delivery system through 2 of our 3 pivots. One of our pivots is on land with variable soils and drains to cross. Following completion of EM (Electromagnetic mapping) we decided to install variable rate irrigation (VRI) on this pivot to provide better water use efficiency.

5 In our development we then attempted to go beyond the current industry requirements knowing the pressure the industry is coming under and we wanted to lead by example.

6 We have experimented with different pasture species to reduce N loss, run a largely grass based dairy unit and have moved from kale to beet in our wintering system to reduce the N leached from the winter grazing area.

7 I have a Bachelor of Agricultural Science from Lincoln University specialising in Farm Management. I am a member of the NZ Institute of Primary Industry Management, Registered Farm Management Consultant (1980) and a Life Member of the NZ Primary Industry Management.

8 I have been a Farm Consultant for 34 years throughout Canterbury. I have worked in the Mayfield Hinds area for approximately 31 years since moving to a consultancy base in Mid Canterbury. I initially worked for Engelbrecht, Royds and Tavendale, then as a partner of JB Tavendale & Co. The last 12 years I have been consulting in my own business of Everest Farm Consulting Ltd.

9 In my Farm Consulting I have been involved extensively with technology transfer both on an individual basis, with groups (discussion groups) and with larger field days and seminars.

10 With individual clients my work has completed the full gamut from:

10.1 technical assistance (how do I do it and what tools do I need) relating to stock feeding and breeding, pasture and crop establishment, growing and harvesting or feeding.

10.2 Development opportunities for clients looking at feasibility and, for example, the cost/benefit of irrigation development or enhancement of the existing irrigation system. This requires an understanding of the resources on the property (land, labour and capital) and how they all interact. Just because it works for one farm does not necessarily mean it will work the same for his/her neighbour.

11 Knowledge of what can be achieved in the district as well as good knowledge of the costs of running an operation is required for evaluating property that new entrants may purchase or expansion options for existing operators. The evaluation of these proposals involves accounts analysis, budgets and cashflows.

12 I have facilitated and spoken at numerous field days, run the Monitor Farm Programme on 7 properties for Beef and Lamb, and run discussion groups (one for over 30 years) for farmers throughout the wider Canterbury region.

13 I have contributed papers to Farm Management conferences. I have been on the organising committee for a number of conferences including the position of Chair of the World Farm Management Congress. This Congress was to be held in Christchurch but following the earthquake was relocated to Methven with just over a month lead time.

14 I have significant knowledge built up over time with my clients in the wider Canterbury area and specifically with clients in the Hinds subzone and MHIL shareholders.

15 Over 30 years I have seen considerable changes and challenges in the area:

15.1 from the ‘low lights’ of the rural recession in the mid 1980’s in which many farmers were forced to leave their property with low product prices, high interest rates and low levels of profitability. For those that were in the agricultural servicing industry at this time it taught us some significant lessons including:

(a) Rapid changes in national policies can be fatal to farming families as they cannot react quickly enough (e.g. removal of SMPs, market interest rates that doubled).

(b) New Zealanders and farmers are adaptable creatures and will find ways of solving something if they can, particularly if it is economic.

(c) The 'fallout' to the wider community of Ashburton is immense when agriculture and the economy are in a very poor shape.

15.2 To the 'high lights' of the uptake of technology:

(a) An example of this is shown in the benefits of pregnancy scanning in sheep. Initially all we used the pregnancy scanning for was to sort wet and dry ewes but rapidly it became obvious that early determination of multiple lambs could help with survival of the ewe (better nutrition to meet her needs), better survival of lambs (feed better late pregnancy to improve birth weight and therefore survival), and better allocation of spring feed for single bearing and multiple bearing ewes.

(b) From only a few farms scanning sheep for the first 2-3 years (partly due to the lack of plant and trained operators for the scanners) to virtually all plains farmers using scanning over 10 years. Technology takes time to be evaluated but once success is seen the 'snowball' rapidly picks up size and momentum.

(c) More recently an example would be the rapid expansion of the fodder beet area. Some farmers have been developing the growing system over the last 7 years but in the last 3 years the uptake of this technology has been exponential.

16 I am a member of the Hinds Plains Working Group which currently has a brief to develop recommendations to the Ashburton Zone Committee. We are attempting to facilitate a "water body by water body" approach to develop management plans for the main water bodies of the lower Hinds Plains.

17 While I am a Director of MHIL, I have considerable experience in matters of on-farm management and economics. I confirm I have read the code of conduct for expert witnesses (Environment court Practice Note, 2014) and agree to comply with it. I have presented expert evidence on similar matters before, for example Ravensdown vs Balance Wilson vs Wilson. My evidence addresses matters within the scope of my expertise. My evidence is an impartial expression of my opinion.

18 In my opinion, farmers do respond when they can see a way through and it is economic for them to do so.

Scope of Evidence

19 In this brief, I discuss:

19.1 The economic impact of the proposed Variation 2 provisions on Scheme farmers.

19.2 The soil type the Mayfield Hinds Scheme covers and how this differs from the rest of the Hinds catchment.

19.3 The use of groundwater within the Scheme.

19.4 Possible solutions to dairy and dairy support definitions.

20 In preparing my evidence I have relied on the information provided in:

20.1 Mayfield Hinds Irrigation Limited – Variation 2 proposed Canterbury Land and Water Regional Plan Report, Hugh Eaton and Julian Gaffaney 4 May 2015;

20.2 Derivation of the Actual Reductions Possible to Achieve Water Limits in V2 of the LWRP, prepared for RDRML, the Agribusiness Group March 2015;

20.3 Lincoln University Dairy Farm Focus Day 7 May 2015, South Island Dairy Development Centre;

20.4 Proposed Variation 2 to the Proposed Canterbury Land and Water Regional Plan – Section 13 Ashburton;

20.5 Variation 2 version showing Officer Section 42A Report Recommendations;

20.6 Draft evidence of Mark Neal on behalf of Dairy NZ; amd

20.7 DSM – Dairy System Monitoring – Year End Analysis 2012/13 MRB – Jeremy Savage, Julian Gaffaney and Sam Lucas.

Economic Impact Dairy Farm

21 The Lincoln University Dairy Farm (**LUDF**) has several strategic objectives, in particular:

To maximise sustainable profit embracing the whole farm system through:

- *Increasing productivity*
- *Without increasing the farms total environmental footprint*
- *While operating within definable and acceptable animal welfare targets and*

- *Remaining relevant to Canterbury dairy farms by demonstrating practices achieved by leading and progressive farmers*

- *LUDF is to accept a higher level of risk (that maybe acceptable to many farmers) in the initial or transition phase of this project.*

…to ensure optimal use of all nutrients on farms, including effluent, fertiliser, nutrients imported from supplements and atmospheric nitrogen; through storage where necessary, distribution according to plant needs and retention in root zone.

22 The LUDF financial returns are shown in Table I, which is **attached** as Appendix 1.

23 LUDF has adopted an aggressive strategy to reduce N leached (calculated via Overseer 6.2) since 2013/14 season. In the 2014-15 season LUDF has adopted "a nil-infrastructure, low input" strategy.

24 LUDF N loss as predicted from Overseer 6.2 is:

	2012/13	2013/14	2014/15
Overseer 6.2 N leached	56	43	37

25 For the period 2012/13 to 2014/15 LUDF has managed to reduce N loss by a massive 34%

26 Comparing it to the average for the 2012-13 season period, LUDF in the 2014-15 season has:

26.1 Reduced its stocking rate by 11% (3.94 - 3.5 cows/ha).

26.2 Reduced its nitrogen input by 59% (350kgN – 143kgN).

26.3 Reduced the quantity of supplement on the dairy platform by 32% (434kgDM - 295kgDM).

26.4 Reduced milk production by 9.3% (300,484 – 272,500kgMS).

26.5 Note the 2014/15 results are provisional only.

27 The LUDF analysis has been completed:

27.1 Actual production but with a standard milk payment of $6.61/kgMS (note the income is also adjusted for stock sales which adds $0.43/kgMS to the average for 2007-2012).

27.2 Expenditure is as per LUDF for that season. It should be noted that expenditure can vary as income changes. In a good financial year 'catch up maintenance' expenditure can be made but in a poor year expenditure may be withheld.

27.3 As the average milk payout for 07-12 was $6.62/kgMS the expenditure range shown for 07-12 will equate very closely to that which would have occurred at a $6.61/kgMS payout.

27.4 Dairy operating profit in LUDF figures is EBIT (Earnings Before Interest and Tax) less an allowance for depreciation ($105,000 prior to 2012/13 and $116,000 in subsequent years).

27.5 LUDF does not include debt servicing or drawings and tax into their analysis. We have used a debt of $30/kgMS and $23/kgMS in our analysis and an interest rate of 6.7%. While it is acknowledged that some of the managers wages could be allocated to drawings for an owner, it is my view that this is insufficient and as a result I have added an additional $110,000 for drawings and tax into the analysis.

27.6 Surplus generated is the Dairy Operating Profit less debt servicing, drawings and tax.

Industry Debt

28 I have contacted Tim O'Sullivan BNZ Agri Manager Ashburton and George Lumsden Rabobank Agri Manager Ashburton to obtain relevant debt levels across their client base. Their consensus was:

28.1 Dairy:

(a) Average $23/kgMS debt; and

(b) Top quartile $30/kgMS debt.

28.2 Dairy Support:

(a) Average $14,000/ha; and

(b) Top quartile $20,000/ha.

29 We have used these figures in our analysis.

30 In summary, for LUDF at 160ha producing 279,000kgMS the dairy farm debt equates to:

Average	$6,417,000	(approximately 50% of total assets)
Top 25%	$8,370,000	(approximately 68% of total assets)

31 I have summarised the LUDF results below for the 2012-13 year (prior to environmental changes) and for 2013-14 and 2014/15 (provisional) seasons:

LUDF	**12/13**	**13/14**	**14/15 Provisional**	**14/15 @ $4.75 payout**
Dairy Operation Profit at $6.61/kgMS	823,680	690,880	699,520	191,925
Less Debt servicing $30/kg Interest @ 6.7%	561,600	554,720	547,680	547,680
Less Drawings and Tax	110,000	110,000	110,000	110,000
Surplus	152,080	261,150	-$41,840	-$465,755

32 Using a standard $6.61/kgMS milk payout the LUDF has reduced N leached by 34% but reduced surplus by $110,240.

33 It is not just stock numbers that is important to reducing discharges but also the productivity from the stock. If stocking rate reduces but per head performance increases so that the milk solids/ha is the same the nutrient discharge from the milking platform is very similar. In other words if a reduction of cow stocking rate is not followed by a reduction in milk production/ha the reduction in nutrient leached from the dairy platform will be minimal.

34 If cow numbers are reduced on the milking platform then there will be an associated reduction in nutrients leached from the winter grazing area and also less young stock will have to be reared.

35 If the projected payout for 2014/15 of $4.75/kgMS is inserted into the 2014/15 year the surplus of $41,840 for the unit would become -$465,755.

36 I note that LUDF has been in Dairy Systems Monitoring (**DSM**), run by Macfarlane Rural Business, where over 50 Canterbury dairy farms are monitored for physical and financial performance.

37 From the DSM data supplied by Macfarlane Rural Business, Lincoln University has property performing physically and financially in the top 5% of dairy farms surveyed in Canterbury. Even at this level of performance, LUDF would not generate a surplus after debt servicing ($30kgMS @ 6.7% interest), tax and drawings at $4.70/kgMS.

38 The benchmark data from Canterbury Dairy Farms provided by Macfarlane Rural Business for the 2012/2013 year is shown in the table below:

	Bottom	Average	Top 25%	LUDF
EBIT/ha	$1,492/ha	$2,768/ha	$3,825/ha	$5,390/ha

39 The EBIT from LUDF was in the top 25% of the monitored farms.

40 The EBIT from the top 25% in the sample (which includes LUDF) is 38% above the average. Therefore average operating surplus could be $399,680.

41 I note there is significant input by industry to LUDF to provide the best resources possible to achieve the desired outcomes.

42 Given that LUDF results are considerably above the average result of the DSM monitored farms, you could therefore expect the average farm in the DSM analysis and therefore in the Hinds Catchment or indeed MHIL dairy farming shareholders to be worse off than LUDF.

43 In summary LUDF has achieved at 34% reduction in the nitrogen discharge which at the average payout for the last 6 years (with industry debt and drawings) would result in a surplus of $42,000 on an asset base of $8.5 – 9M i.e. less than 0.05% return on capital.

44 At the current payout of $4.75 LUDF would generate a -$465,000 loss.

45 LUDF is shown to be in the top group of dairy farmers (maybe top 5%) and therefore it could be extrapolated the average dairy farm, in the Hinds Catchment, would not be viable with this level of mitigation to reduce N output with the current knowledge base.

Economic Impact – Dairy Support Unit

46 The Eaton and Gaffaney report compares two dairy support systems and the modelled cost of mitigations both in nutrient loss reductions and financial performance (via Overseer and Farmax). The details of this analysis are shown in the table below.

	Dairy Support 1 Steady State	Dairy Support 1 Mitigated	Dairy Support 2 Steady State	Dairy Support 2 Mitigated
OVERSEER N Loss	52	40	33	28
Net Surplus @ $15,000/ha debt	$107,620	$53,800	$205,890	$5,010
Net Surplus @ $20,000/ha debt	$20,250	-$33,300	$102,040	-$98,840

47 Dairy Support 1 was modelled on a 260ha unit irrigated by pivots and rotorainers. The farm programme includes:

47.1 Fodder beet and kale – maize silage – wheat or barley or small seeds – pasture (3 years); and

47.2 Wintering 1650 cows for 60 days and grazing 450 yearling heifers for 12 months.

48 Dairy Support 2 was modelled on a 310ha unit fully pivot irrigated. The farm programme includes:

48.1 Fodder beet – new grass with half undersown for barley silage – pasture (3 years); and

48.2 Wintering 2250 cows for 60 days, grazing 750 calves and 750 yearling heifers for a year.

49 Various mitigations were considered for each property but in summary included:

49.1 Reduced dairy cow numbers wintered by 33%

49.2 Reduced young stock grazed by 39%

49.3 Reduced area grown in kale and replaced with smaller area of fodder beet

49.4 Strategic use of nitrogen and some Gibberellic acid used

49.5 Improvement of irrigation efficiency where possible.

49.6 Sale of feed off the farm

49.7 Change of pasture and crop species to help reduce leaching.

50 I note the following assumptions:

50.1 Long term interest rates based on 6.7%;

50.2 Mitigations for dairy support 1 included reduced cow numbers by 33%, reduced heifer numbers by 39%, reduced kale area and nitrogen application; and

50.3 Mitigations for dairy support 2 included cow and heifer numbers reduced by 20%, reduced N applications, removal and sale of 20% of feed brown off the farm.

51 I consider Dairy support farms can make small reductions in N leached with current technologies. The greatest gains shown in the MRB models for dairy support are from a reduction in stock numbers carried. Without a corresponding reduction to stock numbers on dairy farms, this can only result in the surplus stock being carried on other properties in the

zone. The corresponding increase in the potential discharge from the new property only transfers the issue.

52 Farm debt has been assessed at $15,000/ha and $20,000/ha by Tim O'Sullivan BNZ and George Lumsden Rabobank Agribusiness managers in Ashburton.

53 Debt levels of around $15,000/ha are considered around average for these dairy support properties. There is a wide range within this group as dairy support may also include sheep and beef as well as a proportion of arable cropping.

54 Interest rate has been based on the long term indicative rate of 6.7% the same figure was used in the dairy farm analysis.

55 Drawings and tax of $110,000 has been deducted as per the dairy analysis.

56 The table indicates for Dairy Support 1:

56.1 The model has reduced N leached by 23% and net surplus reduced by $53,820, a 50% reduction at land debt of $15,000/ha.

56.2 But at debt levels of $20,000/ha the property changes from a breakeven to a loss position.

56.3 Many farmers in this group have added pivot irrigation to their properties at an installed cost in the order of $5,000/ha.

57 The table indicates for Dairy Support 2

57.1 The model has reduced N leached by 15% and net surplus was reduced by $200,000 to a breakeven position only.

57.2 If land debt levels were increased to $20,000/ha the profitability of the property deteriorates by $200,000 with the result a significant cash loss is generated.

58 The greatest gains in the Eaton Gaffaney report in reducing N loss come from the reduction in cattle numbers. The catch with the drop in stock numbers carried on the support family is that if there is not a corresponding drop in stock numbers from the dairy farms the grazing animals will have to go to another property i.e. still the same discharge within the zone if the same number of animals are grazed.

59 LUDF has reduced its stocking rate by only 11% to reduce the discharge by 34% but as already stated this level of mitigation would leave many farmers in the catchment non viable at the average payout of $6.61/kgMS let alone at the current payout of $4.75/kgMS.

60 Even if the LUDF programme was followed with a reduction of 11% stock numbers this is still 9% more stock numbers in the catchment than are required to meet the mitigation proposed in the Eaton Gaffaney models.

61 It could be proposed that the dairy support farmers could lift their rates charged for grazing to help offset the mitigation steps taken. While this statement is true to a point, it then would place even more financial stress on the dairy farmers, who as the previous analysis shows only have a limited capacity to move.

62 In summary dairy support farms can make reduction in N discharge with present technologies but viability for many is seriously compromised.

63 The mitigations proposed for dairy support 2 reduce the N discharge by 23%. However the mitigations described result in a lack of viability at any debt level on the property. Smaller mitigations were proposed for dairy support 1 that reduced the N discharge by up to 15% and still resulted in a net loss ($33,000) at a debt of $20,000/ha.

Soil type

64 MHIL shareholders are particularly affected by reductions due to the soil type of the irrigated areas. MHIL shareholder soils are some of the lightest in the zone under consideration.

65 SMaps show the majority of the soil in the MHIL zone is Lismore stony silt loam. The water holding capacity (WHC) of these lismore soils is listed at 77.4mm. Comparatively Ruapuna silt and western end of the Hinds plain is 83.5mm. Templeton shallow silt soils generally run along the river margins and have a higher WHC at 151.9mm. The dominant soils in the lower end of the zone are Lowcliffe silt loam which have a WHC of 61.1mm. The balance of the coastal strip forms part of the Hinds drainage network and are heavier soils often with impeded drainage.

66 The reason MHIL and Valetta schemes were developed originally is that they were on the plains. The continued poor financial performance from sheep, beef and mixed farming in the 1980's and 1990's led to the current expansion of dairy farms. Dairy is suited to lighter soils with irrigation, due to reliable summer growth and low pugging of soil in wet conditions.

67 Shallow soils with lower water holding capacity also leads to increased leaching with higher rainfall and reduced pasture growth. Although I note faster pasture growth takes up soil nitrogen faster and minimises nitrate leaching over the period. There is also a lack of water logging.

68 Even with improved irrigation management, application and scheduling these soils are more prone to N leaching. A rainfall even of 25mm or more during the irrigation season will invariably lead to some movement of nutrients through the soil profile.

69 Modern management would lead efficient irrigators to not allow their soils to be below 50% WHC, being the plant available soil moisture level. With a soil of 60-70mm total WHC capacity, this leaves less than 30mm of 'free board' for any rainfall event.

70 Pivots now apply generally 10-15mm per application, compared to 40-50mm+ with borderdyke irrigation. This has significantly improved the ability of soils to accommodate rainfall events to utilise the water without surplus running to groundwater. But we are still in a region where heavy rainfall events can occur at any time of the year and often with only a few days warning.

71 Farmers have spent capital in recent years (in the order of $4-5,000/ha, $640-800,000 for 160 ha dairy farm) to improve watering efficiency moving from low energy input borderdyke irrigation to highly water efficient pivot type spray systems. This has reduced leaching in the summer period significantly. It is generally considered water efficiency has increased from 40% to 80%.

72 Dairy farming and dairy support now covers 88% of the MHIL scheme area, 56% and 32% respectively. The impact of the lighter soil which has a higher discharge of nitrate to groundwater in the zone will mean greater levels of mitigation are required by MHIL shareholders by 2035, and beyond. This is more difficult to achieve both physically and financially.

73 Many of the MHIL shareholders have already made significant improvements in irrigation efficiency. In 2009 28% of the MHIL land was watered by borderdyke means. This has dropped to 10% in 2015.

74 Likewise the more efficient pivot irrigators we currently have, have increased from 45% of the scheme area in 2009 to 67% in 2015. This is a 22% increase or 7375ha increase in pivoted area over 5 years.

75 This improvement in efficiency through moving to pivots has come at a significant capital cost. Close to $36M has been invested by farmers to improve watering efficiency.

76 The scheme too has invested heavily in on farm storage (7.5M m^3) and off farm storage (6.1M m^3) at Carew to buffer the effects of reduced flows in the Rangitata river. This storage has an additional benefit, because as farmers are aware that they have water in storage and therefore the risk of 'running out' of water from the Rangitata, they can run the plant available moisture level in the soil at a lower level as they are sure they can keep irrigating if the need arises.

77 This is a very significant addition to the irrigation scheme but also assists with the reduction of nutrient loss.

Groundwater

78 Despite irrigation water being mainly supplied for the RDR for MHIL there are still farmers who for security and historical reasons have irrigation wells. Some of these wells are required for dairy shed water (cooling and plant wash) and for stock water.

79 The addition of on farm and scheme storage for MHIL will reduce but not remove the need for well irrigation water at times when the RDR is under severe restrictions for a longer period of time. The Carew ponds, although not yet tested, have the capability to buffer a 20% restriction for 21 days.

80 This will reduce but not remove the requirement for pumping from groundwater wells.

81 It is of concern that the Hinds Groundwater Zone has been changed to red even though the zone is currently not over allocated. We have been advised that this is of a precautionary basis.

82 This change of status effectively stifles any irrigation development (10,000ha has been allocated by the zone committee with a nutrient allowance) outside of Community Irrigation Schemes.

83 If the intention to enable up to 10,000ha irrigation development within a maximum load then the change of the zone status has removed a large area currently not watered in the zone from this opportunity.

Definitions of Dairy and Dairy Support

84 It is my opinion that it is difficult particularly to define a dairy support farmer. The owner may define an arable farm with dairy support and either a dairy support or arable farm depending on his/her leaning.

85 A possible solution to this is to group all farmers over a specified limit (XkgN/ha loss estimated via OVERSEER) in one group that will have to take mitigation measures.

86 This is irrespective of farm type and breaks down the need to define which parts of a property meet the definitions of dairy and dairy support.

Phillip Graham Everest

APPENDIX 1 - TABLE I

Lincoln University Dairy Farm (LUDF)

							Policy change to meet proposed LWPP Requirements		
	07/08	08/09	09/10	10/1	11/12	12/13	Average 07/08-12/13	13/14	14/15 Provisional
Area (ha)	160								
Cows milked	680	683	660	669	632	630		650	560
Production kgMS/yr							279,378	276,019	272,500*est
kgMS/ha	1744	1634	1710	1653	1861	1878		1725	1534
N leached est (Overseer vs 6.2)						56		43	37
Dairy Operating Profit $/ha @ $6.61kgMS constant payout	5731	3791	4696	4345	4655	5334	4758	3849	3916
Dairy Operating Profit for 160ha							$761,280	$615,940	$626,560
Debt Servicing							430,521	425,345	419,922
@ 6.7% interest $30/kgMS debt/ha							561,549	554,798	547,725
Drawings and tax							110,000	110,000	110,000
Cash surplus									
@ $30/kgMS debt/ha							89,731	-48,958	-31,165