Tabled @ Hearing - RMcDowell
17.07.15

Hind Plains Land and Water Partnership Evidence

1. This panel has heard and read a great deal of evidence on the state of the Hinds Plains environment and of actions needed to be taken to address it.
2. When all is done and dusted this plan will achieve its purpose only if farmers like us can make it work.

3. First I would like to tell you a bit about my farm and our district.

4. I am a farmer and I and my wife farm at Mayfield. We farm 357 ha on two blocks of land. Approx half is irrigated with water from the BCI scheme. It is a diverse farm. It,

- Grows 350 ha per year of arable crops such as wheat, barley, ryecorn, grass seed and carrot seed.
- Grows winter feeds such as Rape, Greenfeed Oats, Kale and Fodder Beet.
- Finishes lambs for the meat works through the winter off season. Numbers finished ranges from 2500 to 7,000 per year depending on seasonal conditions and markets.
- Grazes dairy cows in winter. Currently 800 but numbers have ranged from 600 to 2,000.
- Raises dairy replacement stock on contract for dairy farmers. Currently we have 650 heifer calves but the range has been 400 to 1,000.
- Supplies up to 400 service bulls to dairy farms for mating with cows when artificial insemination is completed or not used.
- Supplies fibre, silage, wheat and barley supplements to dairy farmers.

5. I have lived in the Mayfield area for most all my life. When I was born my father had a farm on the banks of the South Hinds River. It had land on both sides of the river. There was no bridge across the river but we could operate the farm because, for most of the year, the river was dry and we could easily shift stock, feed and machinery over both halves of the farm.
6. My father sold the farm when I was five because occasionally the river did flow and sometimes it flooded and, when it did, half the farm was inaccessible. We bought the farm that is the hub of our present day farm.

7. Some want the Hinds River to have permanent or minimum flows. Over a large part of its course, particularly inland of SH1, the Hinds River never had permanent flows. It has always been dry for much of the year.

8. This water in my drink bottle is from a stock water race. It is rather turbid. Much different to the water here. Most of you would be reluctant to drink it.
9. This water was collected from a race that flows through our farm. In the next 800 metres downstream from where I collected it three houses depend on this water for domestic purposes. At least one of them has no rain water collection. That is not uncommon, even now, in our part of the Hinds Plains. Well water is not available.
10. Thirty seven years ago I arrived home from my honeymoon with my new wife to a new house. It wasn't new but it was new for us. There was no water, the tank was empty. Before filling it I checked the tank. There was mud and sediment about a foot deep in the bottom.
11. The water supplying the tank was pumped direct from the stock water race with no filtration or settling of sediment. This was way before dairying and dirty dairying.
12. My first job was scooping out the thick sediment before refilling the tank from the same water race. My wife was a registered nurse with some knowledge of public health. It was an eye opener for her as a city girl but normal for the district. My wife has boiled drinking water for the past 37 years.

13. Until 4 yrs ago the Mayfield village water supply also came from a stock water race. It had minimal filtration and was treated somewhat but at times was undrinkable. It had been that way for at least 20 years.
14. In 1999, while I was chair of the Mayfield School Board of Trustees, the Principal rang me one day to say he was fed up with the water quality at the school and had called in the army to supply clean water. The army turned up. Along with TV crews and reporters and Mayfield was on the news.
15. The army went away after a couple of weeks. No action from the Health Board. No action from the council. The Ministry of Ed, however, did provide a special grant of $25,000 to the school to install a sophisticated filtration system.
16. What riled the locals was that the council had priced a filtration setup for the whole village, including the school, at $50,000 but considered it too expensive for the village to afford. Another $25,000 and not just the school but the whole village could have had clean water.
17. Twelve years after the army left nothing had changed.
18. Finally, one resident got so fed up he put up $70,000 of his own money and got a well driller to drill a well. He struck water at 119 metres. Only 5 lit/sec so the council baulked at using it. Finally they agreed with the residents that it was enough and now Mayfield now has good clean water.

19. Dr Alister Humphrey of the CDHB at para 3.9 in his evidence to these hearings said the Mayfield "supply is potentially vulnerable to increasing nitrates also". This new found concern with the state of Mayfield water was greeted with derision by the man who drilled the well. The well is deep and clean. Where, he asked, was the health board through the years the residents battled to get a solution to their sub standard water?

20. One of the less desirable features of living in a farming area such as the Hinds Plains is the higher than average incidence of enteric diseases such as campylobacter.
21. The local veterinary practices are aware of this. Vetlife is the largest Veterinarian service company in the South Island. They put out a regular newsletter to clients.
22. In the August 2012 edition they printed an article by Professor Nigel French of Massey University. I have copies.

23. French identifies a clear correlation between campylobacter and rural areas with high cattle numbers.
24. He shows that while campylobacter normally peaks during the hot summer moths of Nov to February, in dairy farming areas it peaks in Aug to October – calving time. Ashburton district is now such an area and, like other dairy farming areas, has a high incidence of campylobacter.
25. In Vetlife's September 2012 edition veterinarian Dr Jessica McDowell follows up on French's article by demonstrating measures farmers should take to reduce the risk to human health and in particular to young children during the high risk calving period.
26. Local residents would consider their veterinarians have been doing a better job of identifying human health risks and addressing them than their Health Board has.

27. I doubt there is a single farmer in the HP who does not realize that some parts of their environmental footprint are of concern and need to be addressed.
28. We know that, if these issues are to be addressed, we will need to change the way we do things. We know that achieving some of the desired outcomes will not be easy. We know that when all the experts, scientists and lawyers have gone home and the plan is settled it, is us who will have to make it work. If we can't then the plan is not worth the paper it is written on nor the time and effort that you and everybody else has put into it.
29. It is our view that, in its present sate, the plan will not work. If we wish to achieve the overall outcomes the Zone Committee (ZC) established then we need to change how we get there

30. The Ashburton ZC's first real task was to draw up a plan for the Hinds Plains. Its two greatest handicaps were,

- Like the other ZC's, it had not done this before. There was no template or best method. It was writing the book as it went.
- It had no real representation from the HP community, particularly those that had skin in the game.

31. It established a consultation programme based on public meetings in the Hinds Hall. These were very well attended and much feedback was given. While these were effective in highlighting issues they were ineffective in identifying solutions.
32. Towards the end of this process a number of us in the community felt that this process was not sufficiently addressing the major concerns of the community. We called a meeting of the public after one of these consultations and formed a group which we named the Hinds Plains Land and Water Partnership to co-ordinate community views and represent them to the ZC. It was an open group with no formal structure or incorporation, apart from appointing me to chair it.
33. We built a good relationship with the ZC, for the most part, and had some influence on their thinking. The S42a report notes we had 13 meetings with the ZC. We were able to critique a number of reports presented to the ZC and succeeded in having one particularly poor report on economic impacts canned.
34. We were less successful in other areas. The ZC was already well down the track of identifying dairy and dairy support farming as being the major bearers of mitigation responsibility.
35. On a simple analysis, these two farming systems appeared responsible for most of the increase in N losses. It therefore seemed sensible that they should bear the brunt of mitigation. It also seemed that, in forming this view, the ZC considered dairy farmers were in the best position to afford the costs of mitigation. At that time dairying was receiving record high payouts. My, how the world has changed.
36. It turned out that the devil was in the detail. Two major problems with this approach.
37. How do you define a dairy farm? Or even more difficult, how do you define a dairy support farm? Our evidence today will show the practical problems of trying to do that.
38. If you can make the definitions, then are the different targets for dairy, diary support and other farming n Var 2 equitable?
39. Let's take three stock farms that have all achieved GMP and are all leaking similar amounts of N, say 50 kg/ha.

- If one of them is a dairy farm it is required to reduce its losses by 45% by 2035.
- If one is a dairy support farm it is required to reduce by 25 %.

- If the third is a beef farm with similar stock numbers to the dairy support farm it needs to make no further reductions.
- If all 3 farms are successful in reaching their targets, in 2035 the dairy farm will be leaking 27.5 kg/ha. The dairy support farm will be leaking 37.5 kg and the beef farm will be unchanged at 50kg.

Provision for Increased Irrigation

40. A contentious issue in Var 2 has been the allowance of 30,000 ha for intensification. A number of submitters have expressed concern at this provision. If the zone is over allocated then allowing further intensification will surely make it worse.
41. The short answer is yes, if nothing else changes.
42. However the ZC, in preparing its plan, was mindful of the CWMS which set goals for increased irrigation.
43. In setting its targets for catchment load it did so with the intention of also meeting this CWMS goal. If provision for intensification was to be made then it necessarily meant that other farmers would have to reduce more than if no intensification was allowed. That is the approach the ZC made.
44. This approach was not universally popular within the HPLWP. Farmers were aware that the reductions they would be required to make would be greater if intensification was allowed elsewhere in the catchment and some resisted this. In the end the need for increasing economic value across the district was recognized.
45. A number of submitters have questioned the inclusion of additional irrigation in a plan for what is considered to be an overloaded environment.
46. Three things to note here.

1) While the ZC in its ZIP addendum identified extra irrigation, Var 2 actually states that it is intensification, not irrigation, so the meaning is wider i.e. the increased loss farming can be other than new irrigation.
2) Whether it is irrigation or intensification, the ZC was deliberate in its intention to allow for new higher loss farming and the overall load targets they set included this extra loss.
3) The provision for intensification rather than irrigation allows the HPLWP proposal for flexibility under a flexibility cap to occur alongside some extra intensification by irrigation within the targets set by the ZC.

Catchment Load Modelling and Overseer

47. There has been much confusion about the role of modelling in the catchment both for establishing catchment load and establishing allocations and limits for farmers.

Time and time again submitters have confused or conflated the physical measured data of the catchment with modelled estimates.

48. The only measurement subject to scientific rigour has been the analysis of water samples. Even here the HPLWP has had concerns around some of the sample sites. Members of HPLWP were aware that some sampling wells were poorly located or poorly managed. E.g. one was near a cattle yards where contamination could occur from stock effluent. Others were sited where runoff in exceptional weather events were likely to contaminate test results. HPLWP worked to try and ensure sample sites were robust. Although we believed there were errors or poor sample hygiene affecting the accuracy of the published results we accept that, once these faulty samples are removed from the data set, we acknowledge there is still a trend of rising nutrient levels that raise concern.
49. Catchment load modelling has been used to establish a correlation between estimated catchment load and measured groundwater nutrient concentrations. Initial work estimated that Catchment load was around 4500 tonnes. This was correlated to the groundwater concentration of around 9mg/litre. The ZC set a target concentration of 6.9 mg/l. A reduction on this concentration correlated to a reduction in modelled catchment load from an calculated 4,500 tonnes to an calculated 3400 tonnes.
50. Subsequent improved models have estimated catchment load as considerably higher. While revised models may have calculated different numbers nothing has changed physically. The process where contaminants move from the soil surface through to groundwater, with some amelioration while doing so, is unchanged. The actual catchment load, whatever it is, does not change with a model revision. Only the calculated figure has changed. Because of that, when the model is revised, the correlation between the model estimate and the actual groundwater concentration must also change.
51. Analysis by Dairy NZ and Aqualinc has demonstrated this. HPLWP supports their work.
52. The problem for us as farmers is that the 3400 figure for catchment load target is no longer just a calculation. It is a hard number in the plan. The physical reduction farmers are required to make to their N losses to meet this outdated calculated figure now changes with every model revision of catchment load.
53. The inability to adjust the 3400 tonne load creates a further problem. Irrigation schemes such as BCI and the RDR schemes have nutrient consents that grant a tonnage load to the scheme. Both these consents have the provision to adjust these calculated loads as Overseer is improved so real loads remain consistent. Current work by BCI, at least, in assessing loads under the latest version of Overseer show

that calculated loads will increase. If scheme loads do increase and the 3400 tonne load does not then farms outside the schemes will have to reduce their numbers if the 3400 tonne target remains.

54. Overseer is being continually improved. Farmers welcome greater accuracy but it does create issues. With each version change the numbers for a particular farm change. If it is to remain consistent with previous version then for every farm that goes up another must go down. This means some farms will cross thresholds into different reduction regimes.
55. A further difficulty with Overseer is its difficulty to cope with complex farming systems. It was developed for pastoral farming and, although extensive development had been carried out, it still does not cope with complex arable farms such as that operated by David Clark.
56. Land Use Capability. I ask you to refer to the supplementary paper.

Solution Sought

57. We accept the aspirations for the Hinds Plains, as established by the ZC. However, we have shown that the mechanism in Var 2 to achieve these and in particular the reductions in N contamination, are inequitable and unworkable. HPLWP has worked extensively with other primary sector organizations to develop a mechanism that will have the same goals but will be equitable, workable and acceptable to farmers.
58. That mechanism is outlined in our evidence in paras 29 to 34. Further evidence and analysis of its potential is included in other evidence such as that from Federated farmers, Dairy NZ and others.
    a. It expects all farms with significant losses to make similar contributions to reducing loads. In this it treats all farms equitably
    b. It allows those farms who leak very little and are therefore not part of the problem to be only a minor part of the solution.
    c. It allows those farms with small loss numbers and therefore very little wriggle room to adjust their farming systems without breaching their base line figures numbers compared to higher loss farmers, a certain amount of flexibility.
    d. It allows low loss farms and irrigation schemes the ability to change farming intensity within the limits set by the ZC and Var 2.
    e. It allows more time, when critical, for farmers to meet interim targets.
    f. It has the support of all farm sector organizations.
    g. It does all this while striving to meet the long term catchment targets set by the ZC

59. This will take time to produce results. It may take many years. That is the nature of the problem the community is addressing.

60. We are aware that many in the community would like to see faster progress. That won't be easy but there is one solution that would give almost immediate benefits.
61. Expanding Targeted Stream Augmentation (TSA), as practiced by the Eiffelton Community Irrigation Scheme would do this. Supplementing drain flows with deep well water which was then used for irrigation would provide immediate benefits to drain N levels, minimum flows, drain ecosystems and farming productivity . The concept is proven and workable and, of all the proposed remedies, would be the quickest to implement and to show results.

62. We urge you to adopt the above approaches into Var 2.
63. If you do then we farmers will have a crack at delivering it.

Rab McDowell
12/7/2015

Tabled @ Hearing - R McDowell
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Land Use Capability

"The Land Use Capability (LUC) Classification is defined as a systematic arrangement of different kinds of land according to those properties that determine its capacity for long-term sustained production. Capability is used in the sense of suitability for productive use or uses after taking into account the physical limitations of the land". (from The Land Use Capability Handbook, 3rd Edition)

"Productive capacity depends largely on the physical qualities of the land, soil and the environment".

"Assessment of land for long-term sustained production is based on an interpretation of the physical information in a Land Resource Inventory (LRI), which is compiled from a field assessment of rock types, soils, landform and slopes, erosion types and severities."

Land Use Capability is divided into 8 classes
One being the best land and 8 being the worst. 8 is pretty much mountains or sand dunes.
Classes 1 to 4 are considered suitable for arable cropping with 5 to 8 unsuitable.
Shallow Lismore soils which make up a fair chunk of the HP are classed as 6 or 7 in the handbook.

Other regional Councils have allocated nutrient allowances according to LUC class. E.g. Horizons.

Horizons One Plan Nitrogen Leaching maximum kg/ha by LUC class								
	LUC 1	LUC 2	LUC 3	LUC 4	LUC 5	LUC 6	LUC 7	LUC 8
Year 1	30	27	24	18	16	15	8	2
Year 5	27	25	21	16	13	10	6	2
Year 10	26	22	19	14	13	10	6	2

In this plan, the better the soil the greater the N loss allowance. The problem with this approach is that heavy soils have less propensity to leak N than light soils but are granted the highest leaching allocation. Those that need less are given high allocations and those that need it most are denied it.

The LUC concept is thrown out of whack with irrigation. With irrigation the productivity of lower class soils improves dramatically. Hence the reason for wide spread irrigation in Canterbury.
Lismore soils (LUC 6) with careful irrigation produce crops and pasture within 90% of the best (LUC 1) soils.
Under continued irrigation these light soils improve and deepen due to the microbiological soil forming processes not being impeded by soil moisture deficits. In doing so they move up the LUC chain.

These lighter soils do have a propensity for higher leaching. To allow for this and to enable their capacity for high production under irrigation the Irrigation Schemes with NDA consents allow lighter soils to have a higher discharge allowance while maintaining the schemes overall cap.

For example the BCI based its application for a nutrient consent is based on the following matrix for the allowance for new irrigation.

"The future allocation was based on the following proportions of land use and soil types; Table 2: Nutrient allowance for new users"

	Very Light Soil	Light Soil	Medium Heavy Soil
Dairy	5%	30%	15%
30% wintering cows	1%	6%	3%
70% wintering cows	2%	12%	6%
Arable with process	1%	6%	3%
Arable with small seed	1%	6%	3%

BCI expects its new irrigation development to occur as follows.
10% on Very Light (VL) soils, 60% on Light (L) soils and 30% on Medium Heavy (MH) soils.
It presumes a similar mix of land uses on each soil group. Behind this matrix is a formula that recognizes the propensity for the lighter soils to leak more. It grants Light soils a leaching allowance per hectare 1.25 times the MH soils and the VL soils an allowance 1.67 times the MH soils.
It does this within its overall nutrient cap. If it did not do this the productive capability of the lighter soils could not be realized.

Horizons One Plan allocation compared to BCI allocation								
	LUC 1	LUC 2	LUC 3	LUC 4	LUC 5	LUC 6	LUC 7	LUC 8
Horizons	30	27	24	18	16	15	8	2
BCI	20		25			33		

The BCI numbers in the above table are not directly related to the Horizons numbers. The actual number granted by BCI depends on other factors such as farming type but the table shows the relative allocation for soil type.
The significant thing about this approach is that it is the reverse of that advocated by regions using LUC to set nutrient discharge maximums.

I understand the other irrigation schemes take a similar approach. The schemes cover approx 40,000 ha or a third of the Hinds Plains.

Fish and Game in their evidence advocate the use of LUC in the Hinds Plains.
HPLWP considers that unworkable in the Hinds Plains where light soils, when irrigated and managed correctly, have a higher productive capability than many class 1 soils in other regions.

Rab McDowell
12/7/2015