

BEFORE THE ENVIRONMENT COURT

Under the Resource Management Act 1991 (“Act”)

In the matter of appeals under clause 14 of the First Schedule to the Act concerning the Proposed One Plan for the Manawatu-Wanganui Region and the topic of Surface Water Quality – Non-point source pollution (Chapter 6, Chapter 13, Schedule AB and Schedule D)

between **FEDERATED FARMERS OF NEW ZEALAND**
ENV-2010-WLG-000148

and **MINISTER OF CONSERVATION**
ENV-2010-WLG-000151

and **DAY, MR ANDREW**
ENV-2010-WLG-000158

and **HORTICULTURE NEW ZEALAND**
ENV-2010-WLG-000155

and **WELLINGTON FISH & GAME COUNCIL**
ENV-2010-WLG-000157

and **MANAWATU-WANGANUI REGIONAL COUNCIL**
Respondent

Statement of Evidence in Chief of **PHILLIP HARRY PERCY** on behalf of Andrew Day

Dated: 2 April 2012

1 EXPERIENCE AND EXPERTISE

1. My full name is Phillip Harry Percy. I hold the degree of Bachelor of Resource and Environmental Planning with honours from Massey University. During my degree I completed a specialisation in physical geography which included papers in general and fluvial geomorphology and coastal dune processes.
2. I have been practicing as a planner for 11 years. This has included working as a policy planner for Greater Wellington Regional Council as well as a range of senior planning positions in multidisciplinary consultancies in New Zealand. I have previously worked as a Senior Planner for Eliot Sinclair and Partners in Christchurch and as a Senior Planner for Beca in Wellington. I am currently a Director of Perception Planning Limited, a resource management planning consultancy that I established in 2007.
3. I have also worked as a Planner in the United Kingdom including in consent processing, enforcement and monitoring roles. This included working as a planning officer dealing with heritage buildings, changes of use and new developments throughout the Lake District National Park, in Devon and in London.
4. I have been involved in a professional capacity in a wide range of planning matters including applications for large-scale subdivision consents, land use consents for dwellings, commercial buildings, earthworks and infrastructure projects. I have experience in assessing proposals against both regional and district planning provisions and in both urban and rural environments. I have also been involved in resource consent applications for discharges to land, water and air and also applications to take and use water.
5. My experience specifically relevant to the issue of surface water quality includes the preparation of resource consent applications and assessments of environmental effects for discharges of contaminants to water from land disturbance activities, discharges of stormwater to surface water from urban catchments (including discharges to wetlands), and discharges of treated wastewater from municipal wastewater treatment facilities. I also have experience in relation to discharges of aquatic herbicides and algaecides to surface water bodies for the purpose of controlling invasive aquatic plants.

2 PREVIOUS INVOLVEMENT IN THE PROPOSED ONE PLAN

6. I have been involved in the Proposed One Plan (POP) development and hearings process since 2007 in various capacities. I was engaged as a consultant by Horizons to assist with initial development work on the FARM Strategy method (which relates to the water quality chapters of the POP). I was later engaged by Horizons to prepare the s32 evaluation summary report. I was the s42A planning officer for the Council-level hearings for erodible land (Chapters 5 and 12) and natural hazards (Chapter 10).
7. I am now engaged by Mr Andrew Day to provide planning advice on the Environment Court appeals on the topic of Surface Water Quality. I am also engaged by Wellington Fish & Game to provide planning advice on the Environment Court appeals on the topic of Sustainable Land Management and Accelerated Erosion.

3 EXPERT WITNESS CODE OF PRACTICE

8. I have read the evidence contained in the “Technical Evidence Bundle” lodged with the Court by the respondent, on the topic of surface water quality, and the additional evidence exchanged by the appellants and the respondent in relation to this topic.
9. I have read the Environment Court’s Code of Conduct for Expert Witnesses, and I agree to comply with it. I confirm that the issues addressed in this brief of evidence are within my area of expertise. In relation to the issue of nutrient trading which I address in my evidence, I am not an expert on that particular topic however I have applied by expertise as a planner to knowledge that I have developed in relation to nutrient trading by considering the relevant evidence of technical experts presented on this topic, consideration of the limited number of existing trading frameworks established or proposed in New Zealand, and an examination of some international nutrient trading approaches. I have also read a number of reports and commentaries on nutrient trading. I have applied that developed knowledge to my planning evaluation of the applicability and appropriateness of including a form of nutrient trading as part of the POP water quality management regime.

10. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed. I have specified where my opinion is based on limited or partial information and identified any assumptions I have made in forming my opinions.

4 ABBREVIATIONS USED

POP Proposed One Plan

RPS Section 1 of the POP which is the proposed Regional Policy Statement

RP Section 2 of the POP which is the proposed Regional Plan

NV the notified version of the POP

DV the decisions version of the POP

LUC Land Use Capability

5 SCOPE OF EVIDENCE

11. My evidence is primarily focused on providing a planning analysis of the opportunities for establishing an optional nutrient trading mechanism within the POP, as proposed by Mr Day in his appeal.
12. I have prepared this brief of evidence to focus on the matter of nutrient trading, and do not provide comprehensive analysis of the policy framework and planning matters that relate to this appeal topic more widely. I instead rely on the planning evidence of Helen Marr (planner representing Wellington Fish and Game Council), which covers the broad spectrum of planning issues relevant to this topic. I have read Ms Marr's planning evidence and agree with it and therefore consider it is unnecessary for me to repeat a separate full analysis of those matters in my evidence.

6 EXECUTIVE SUMMARY

13. The technical evidence concludes that including the ability to trade nitrogen leaching rights within a catchment has a positive influence on the costs of a regulatory regime (costs are lowered).
14. The economics experts agreed in conferencing that the list of criteria for a trading regime set out in the evidence of John Ballingall (for Fonterra) is appropriate. I have evaluated the POP management framework as proposed by Ms Marr against these criteria and conclude that the criteria for a trading regime are met.
15. A trading regime in the context of the POP involves adding the ability to transfer nitrogen leaching rights between landowners in order that each landowner meets the regulated nitrogen leaching limits set in the Plan (as proposed in the evidence of Ms Marr). Nitrogen trading is therefore an 'add-on' to the proposed regulatory approach rather than the primary mechanism for managing nitrogen leaching (as is the case in the Lake Taupo catchment).
16. Trading creates several risks to achieving the water quality objectives, primarily because trading enables all allocated nitrogen leaching rights to be taken up (all unused nitrogen leaching allocation is purchased and used by landowners wishing to maximise their nitrogen leaching). These risks can be managed by limiting the basis upon which trading occurs so that the total catchment cap necessary to achieve the water quality outcomes is not exceeded.
17. Trading provides the opportunity for land that is not currently regulated to positively contribute to achieving the water quality objectives by ensuring that nitrogen leaching from that land is managed to meet the catchment nitrogen leaching cap. Without trading, unregulated land uses are not required to control their nitrogen leaching.
18. Trading is likely to provide less tangible benefits in terms of raising community awareness of the contributions individuals are making to water quality outcomes. Trading is likely to trigger conversations between landowners within a catchment and increase their understanding that each landowner has a share of the natural resource (water quality).

7 SCOPE OF MR DAY'S APPEAL

19. Mr Day's appeal traverses several matters that relate to the efficient and effective management of non-point source discharges, and includes concepts such as nutrient trading, inclusion of land use activities in addition to those regulated in the NV and support for nutrient allocation based on Land Use Capability rather than land use. Mr Day sought a number of relief points, the majority of which appear to be focused on opportunities to minimise the cost of the POP management regime, both to regulated land uses and to the wider community. Mr Day also sought as alternative relief, the adoption of the wording contained in the 'Yellow Tracked Changes officers report' which I understand to refer to a version of Chapters 6 and 13 that were presented by Horizons officers to the Hearing Panel as part of their end of hearing report.

20. Mr Day attached to his appeal a copy of his original submission, which was hand written on the pro forma Council submission form. Mr Day's submission was brief and included little elaboration on the points he made, however my reading of his submission is that it addressed the following matters:
 - a. Highlighting that the level of information available at the time he made his submission was such that he was unaware of the impacts of the POP approach on his business (which is a farm business)
 - b. That the community cannot comment on the appropriateness of the policy until the full region-wide costs are clear.
 - c. That allocation of N using LUC may need to be refined (he suggests that the LUC categories may need to be further broken down beyond the unit level)
 - d. That more categories of land use should be included than those targeted in the NV.
 - e. A request for the Council to constructively work with landowners on the practical impacts (environmentally and economically) of the proposed approach.
 - f. That 'a workable solution to this difficult problem' is established.

- g. That the rate of reduction in nitrate levels in water bodies is limited unless there is a thorough analysis of the costs associated with the approach.
 - h. That the LUC Nitrogen loss limits set out in the POP (Table 13.2) were derived based on research from particular catchments and therefore shouldn't be applied across the whole Region.
21. Acknowledging that Mr Day is a lay submitter and did not have professional assistance in drafting his submission, my approach has been to take a relatively broad interpretation of the scope of his submission, particularly given the complexity of some of the issues he raises (region-wide costs, allocation of nutrient discharge rights, and effects of non-point source discharges on water quality). I have also recognised that the provision of a large amount of scientific material during the Council-level hearing has enabled Mr Day to examine those issues in more detail and refine his areas of concern. For these reasons, I have considered the full suite of planning provisions in the POP with reference to Mr Day's submission and subsequent appeal. This has led me to the view that to address the matters raised in Mr Day's submission there are changes necessary at both the RPS level and the RP level of the POP, largely because those two sections of the POP are strongly interrelated. Mr Day has specifically referred to Chapter 13 in his submission and in his appeal, however consequential amendments to the provisions in Chapter 6 of the POP are, in my view, necessary to address the matters in Mr Day's submission and appeal.

8 CONSIDERATION OF OTHER PLANNING EVIDENCE

22. I have viewed the planning evidence of Helen Marr and Gina Sweetman, both for Wellington Fish and Game Council. Overall, I agree with the analysis and recommendations of Ms Marr and Ms Sweetman. Based on my agreement with the evidence of those two planners, I will not provide further analysis of the matters they have addressed except where I consider there is additional analysis required in relation to Mr Day's appeal.
23. I have also read the planning evidence of Clare Barton for the Respondent.

9 COSTS OF POLICY OPTIONS

24. In her planning evidence, Ms Marr provides an analysis of the costs and benefits of the policy options that are the subject of this appeal. She has based her analysis on the evidence provided by the economics experts for various parties and also the conferencing statement prepared by those experts.
25. Ms Marr has adopted a 'relative' evaluation of the economic costs and benefits of the various policy options on the table. She has done this because there is no comprehensive economic analysis available that can be used to evaluate the various options. Some economic cost analysis of the NV was undertaken by Horizons at the Council-level hearing (Neild and Rhodes), however the economics experts have identified several limitations with that analysis. Ms Marr has therefore adopted the approach applied by the economics experts in conferencing, which is to effectively rank the options relative to each other rather than relying on an absolute economic net cost for each. Based on the information limitations and the evidence of the economics experts, I agree that Ms Marr's approach is appropriate.
26. Mr Day provides a considered analysis of what he considers are the limitations with the DV. My understanding of Mr Day's evidence is that he is concerned that the DV has potentially significant cost implications to individuals and wider communities in the following ways:
- a. A failure to allocate rights to leach nitrogen to some landowners potentially devalues their land and businesses because it restricts their opportunity to use their land to its productive potential¹. This is most likely to occur in the longer term should the need to achieve water quality outcomes result in currently unregulated land uses being brought into the N management regime.
 - b. Allocation of rights to leach nitrogen differs for new dairy farming compared with existing dairy farming and therefore one farming type is provided with a greater right to intensify and therefore increase profit over the other². This also has potential implications for land values between those two activities.

¹ See also evidence of Alison Dewes, para 8.9, pg 28

² See evidence of Andrew Day, para 28, pg 10

³ Mr Day explains at para 36, pg 14 of his evidence how existing dairy farms can increase

- c. By allowing increases in Nitrogen leaching to be legitimised³ for existing dairy farms, the liability for addressing the effects of that increase is transferred to other landowners. In other words, the cost of achieving a water quality outcome will be born by landowners who do not already have their rights to leaching secured by resource consent.⁴
27. I have considered the matters raised by Mr Day in his evidence and agree with his concerns in relation to the potential costs of the DV. In my view, the approach adopted in the DV results in costs being incurred unevenly across land use types in the catchment and those cost attributions are not reflective of the actual contribution those activities are making to the water quality issue. While at a regional scale, the economic costs of the DV may not be significantly higher because, on balance, some land use activities will be able to maximise financial return which may balance out the lost return from other activities, at the farm scale there is a potentially significant financial cost.
28. By contrast, the approach to allocation of nitrogen leaching rights in the NV (and Yellow Tracked Changes version) largely avoided the transfer of wealth and liability between land users. The LUC approach in the NV attributes an amount of nitrogen leaching to each parcel of land regardless of the land use occurring on that land. In my view, this equitably allocates nitrogen leaching rights to all land regardless of whether it is regulated or not, and therefore minimises these wealth transfer costs Mr Day has identified in his evidence.
29. If N leaching rights are allocated using LUC or some other mechanism that is similarly equitable there remains the question of whether the rights allocated to individual properties are sufficient to enable land uses to continue profitably. Where the costs to meet specified N leaching limits are very high, either the policy approach needs to be questioned, or it must be modified to minimise those costs. In Mr Day's submission he suggested that modifications to the NV policy approach might be required to ensure that the property-level costs are appropriate. One option he suggested in his evidence was to limit the rate of improvement required of landowners (limit reductions in nitrate levels to 10%),

³ Mr Day explains at para 36, pg 14 of his evidence how existing dairy farms can increase their nitrogen leaching amount even though 'reasonably practicable management practices' are being employed. In brief, a farm could increase their stocking rate from 2 cows/ha to 4 cows/ha with a corresponding increase in N leaching while still employing reasonably practicable management practices.

⁴ See evidence of Andrew Day, para 29, pg 11

which could be achieved by a number of means including modifying the N leaching limit reductions (as set out in Table 13.2 of the NV) or increasing the time periods over which the specified reductions need to occur.

30. The technical conferencing statement of the economics experts⁵ suggests that the alternative policy options promoted by some of the appeal parties (including the DV) were likely to have lower or similar costs compared with variants of the NV. However the economics experts considered that the options with lower costs were also likely to result in lower benefits⁶. Ms Marr provides a useful summary of the relative costs, benefits and effectiveness of the various options in Table 1⁷ of her evidence. On that basis, and taking into account Ms Marr's evidence, it does not appear that there are alternative policy options (to some variant of the NV) that will likely result in lower net costs at the same time as achieving the desired water quality outcomes.
31. The evidence of Alison Dewes demonstrates that there is a range of farm management practices that can be adopted to minimise N leaching. My reading of Ms Dewes' evidence is that, based on the application of good management practices tailored for the farming system involved, most dairy farming activities are likely to be able to achieve Year 1 nitrogen leaching limits in Table 13.2 of the NV⁸ and that the time period and level of nitrogen leaching reduction to achieve the Year 20 numbers is appropriate⁹. On the basis of the technical evidence, it appears to me that the actual costs of the NV policy approach that Mr Day raised concerns about in his submission are able to be minimised.
32. Mr Day has identified in his evidence that he considers there are potentially further cost minimisation options that could be applied to the general NV policy approach, in particular the introduction of the ability to transfer or trade N leaching rights between landowners. I discuss this approach later in my evidence.

⁵ See point 3 of the Economics Experts conferencing statement

⁶ See point 4 of the Economics Experts conferencing statement

⁷ See pg 45 of evidence of Helen Marr

⁸ See Sections 6 and 9 of the evidence of Alison Dewes

⁹ See Section 11 of the evidence of Alison Dewes

10 APPROPRIATENESS OF LUC

33. The appropriateness of the LUC methodology for allocating N leaching rights to land is comprehensively addressed in the evidence of Ms Marr (and Ms Barton). Having viewed the evidence of Ms Marr on this matter, I agree with her analysis.
34. Mr Day also provides assistance in his evidence as to the appropriateness of LUC as an allocation mechanism. Mr Day highlights the limitations of the grand parenting approach that has been proposed by some of the technical experts for Fonterra¹⁰. I agree with the limitations that Mr Day has highlighted with the grand parenting approach and while there may be modifications to the policy framework that are available to address these issues, I consider that this would require a significant alteration to the POP approach in order to avoid the perverse outcomes Mr Day has highlighted in his evidence.
35. On the basis of the above, it is my view that the LUC approach for allocating N leaching rights equitably across catchments is the most efficient and effective of the alternatives proposed.

11 INCLUSION OF ADDITIONAL LAND USE TYPES

36. Mr Day sought in his submission the inclusion of additional land use types to the management regime. Mr Day's evidence sets out the reasoning for this request, and he clarifies that his intention is not to necessarily include additional land use types in the *regulatory* regime at present, but that the contribution that currently unregulated land uses do (and may) make to the achievement of the water management objectives should be accounted for.
37. Mr Day describes in his evidence the relative contribution of unregulated land use¹¹, particularly extensive sheep and beef farming, to the nitrogen loads in the Region's rivers. He also describes the relationship between the proportion of the catchment land area comprised in sheep and beef farming compared with the relative contribution that activity makes to the Nitrogen load in the rivers. Mr Day's point is that the unregulated land uses are contributing a significant amount of nitrogen to the Region's rivers and therefore will influence the

¹⁰ See evidence of John Ballingall

¹¹ See para 30, pg 11 of the evidence of Andrew Day

achievement of the POP objectives. I also note that this observation was made by the Hearing Panel¹².

38. Ms Marr in her planning evidence describes the basis on which she proposes that certain land use activities should be included in the regulatory framework of the POP. I agree with her analysis.
39. Activities that are not regulated should not be forgotten about in the POP framework, particularly where they have potential to increase their Nitrogen discharges at a significant scale and therefore have a significant impact on water quality. Ms Marr summarises this in Section 2.3.2 of her evidence: *'all types of land use in a catchment contribute to the levels of contaminants found in water bodies. However the type and magnitude of this contribution varies depending on the type of land use. In summary, the evidence shows that intensive land uses are the predominant source of non-point source pollution.'* I agree with this analysis.
40. It is also my view that the POP needs to be forward looking, both in term of the timeframes necessary to achieve outcomes through its methods, but also to anticipate what likely changes there will be that may influence the achievement of the objectives. Ms Dewes explains the potential scenarios and the land use changes that may occur over time in her evidence¹³, and she suggests that changes in one land use type can influence how other landowners behave. I consider that the POP should be written to anticipate likely changes to unregulated land uses that could influence the achievement of the objectives.
41. Mr Day describes in his evidence the concept of 'moral hazard', which he considers is not created in the DV but should be introduced to the POP to avoid the situation where landowners undertaking activities that are not regulated perceive that they are given a free ride in terms of nitrogen discharges¹⁴. Mr Day suggests that by creating a policy structure and an allocation regime (LUC) that accounts for all land, a moral hazard is established whereby landowners can see that there are limitations (present or future) on how much nitrogen they can leach from their land. They can choose to leach higher amounts of Nitrogen than what

¹² See pg 8-37 of the Decisions on Submissions to the Propose One Plan, Volume 1 – reasons for the Decisions, August 2010

¹³ See Section 5 of the evidence of Alison Dewes where she discusses potential drivers for land use change.

¹⁴ See Section 13 of the evidence of Andrew Day

they would be able to if they were regulated, but that is an informed decision and they are accepting the risk that they may be required to reduce their Nitrogen leaching in the future to the appropriate levels.

42. Mr Day also considers that enabling trading between regulated and unregulated landowners in the same catchment assists in establishing a moral hazard. In his view, where discussions and exchanges occur within a catchment between the different landowners in that catchment, an increased awareness of the contributions individuals make to water quality occurs and an understanding is developed that for one individual to further exploit the limited water quality resource, that must be compensated by a reduction in nitrogen leaching by someone else.
43. I agree with the approach promoted by Mr Day in relation to the importance of including all land in the management framework in the POP. I use the term 'management framework' on the understanding that it encompasses both the regulatory framework but also simply an acknowledgement that all land use has potential influences on achieving the objectives.
44. I consider that Ms Marr's proposed Policy 6-X in her Appendix 1 provides for this approach. The policy she proposes sets out what the triggers are for catchments and land uses to be regulated, and then states that other land uses and catchments that do not exceed those triggers will be monitored and, importantly, that where water quality issues become apparent and are attributable to land use, they will be included in the active management regime (regulation). This policy approach clearly states that, while there may not be a water quality problem at present attributed to a particular catchment or land use type, landowners do not get a free ride – there is a moral hazard created which landowners are aware of and the consequences of increasing Nitrogen leaching above current levels (regulation) are clearly set out.

12 ABILITY FOR LANDOWNERS TO ACHIEVE OUTCOMES

45. Ms Marr addresses the achievability of the Nitrogen leaching limits that she proposes in her evidence. In my view, Ms Marr's evaluation is accurate and reflects the technical evidence related to this matter.

46. I consider that introducing the ability to trade nitrogen leaching rights would be an additional benefit to Ms Marr's proposed POP provisions. Such an approach provides a further alternative method for landowners to achieve the N leaching limit applicable to their property. As Dr Marsh explains in his evidence, *under the uniform cap all farms have to meet the cap irrespective of the cost, whereas with trading abatement is carried out by those farms who can do so at lowest cost.*¹⁵ Where there is no ability to trade, landowners must achieve their nitrogen loss limit by modifications on-farm. While the technical evidence indicates that in most circumstances this can be achieved affordably¹⁶, it seems appropriate (particularly in terms of efficiency) that, where it is available, further options such as nutrient trading to achieve nutrient limits at least cost should be provided.

13 TRADING

13.1 IS TRADING AN OPTION FOR THE POP?

47. The first question I address is whether trading is an option for the POP. In other words, is trading of any potential benefit to the POP and its implementation. To answer that question, I consider the following points:
- a. Is there a need to minimise costs associated with achieving N loss reductions?
 - b. Does the policy and regulatory framework have the flexibility to incorporate trading?
 - c. Is trading likely to result in the objectives of the POP being achieved more effectively or efficiently?

13.2 IS THERE A NEED TO MINIMISE THE COSTS OF ACHIEVING N LOSS REDUCTIONS

48. The technical evidence as summarised by Ms Marr indicates that the costs to most landowners of achieving her proposed management regime will likely result in neutral or moderate costs to implement without trading. On that basis, the proposed framework proposed by Ms Marr is likely to be efficient when

¹⁵ See para 49, pg 13 of evidence in chief of Dr Dan Marsh

¹⁶ Assuming the LUC leaching numbers proposed by Ms Marr in her evidence are adopted.

accounting for the benefits to be derived and the effectiveness of the approach in achieving the objectives. This suggests that there is not necessarily a need to further reduce costs.

49. However, I consider that where there is an opportunity to refine plan provisions so as to achieve the same outcome but at a lower cost, it is appropriate to adopt that approach (provided there is scope to do so). Dr Marsh considers that trading would reduce costs of the Wellington Fish & Game approach¹⁷. During expert conferencing, the economics experts agreed that '*...an appropriately designed nitrogen trading system could improve the efficiency of achieving the desired outcomes, in particular the Horizons and Wellington Fish & Game proposals*¹⁸. I note that there does not appear to be scope to include trading in the appeals of Wellington Fish and Game or the Minister of Conservation. However, based on my earlier discussion at Section 7, I consider that including trading is within the scope of Mr Day's appeal on the basis that it adds to providing 'a workable solution', it addresses the cost concerns that Mr Day had, and it recognises the contribution that other landowners make to managing the issue.
50. On that basis, I am of the view that an appropriately designed trading regime should be included in POP provisions to assist in minimising costs to those landowners who choose this method of N loss mitigation.

13.3 DOES THE POLICY AND REGULATORY FRAMEWORK HAVE THE FLEXIBILITY TO INCORPORATE TRADING

51. To determine whether the policy and regulatory framework has the flexibility to incorporate trading, I consider there are two key tests. The first is whether the policy framework will continue to be efficient and effective if trading is included. The second is whether the policy framework enables the requirements for trading to be met. I discuss both of these tests later in my evidence, but conclude here that both tests can be met provided certain requirements are put in place for trading.

¹⁷ See para 138, pg 39 of the evidence of Dr Dan Marsh

¹⁸ See point 7 of the Record of Technical Conferencing of Economics Experts dated 20 March 2012

13.4 IS TRADING LIKELY TO RESULT IN THE OBJECTIVES BEING ACHIEVED MORE EFFECTIVELY OR EFFICIENTLY

52. As discussed previously in my evidence, the ability for landowners to transfer Nitrogen leaching rights between them (trading) has the benefit of enabling the Nitrogen leaching reductions to be undertaken by the landowner for whom this is the least cost alternative. This means that trading provides a means for landowners who would normally incur higher costs to reduce their N leaching to achieve the same catchment outcome at least cost. Therefore, an appropriately designed trading regime improves the efficiency of the management regime (landowners can achieve the desired outcome at least cost). I discuss what constitutes an appropriate trading system in Section 14 of my evidence.
53. In terms of effectiveness, trading appears to also have significant benefits. Where the trading is between regulated and unregulated landowners, trading will have the effect of ensuring that the otherwise unregulated landowner is operating their farm to meet the specified Nitrogen leaching allocation limits for their land. Without the trade occurring, there is little incentive for the otherwise unregulated landowner to achieve the N leaching limits for their land, however the ability to trade creates an opportunity whereby the Nitrogen 'seller' can make a profit out of either reducing their actual N loss or maintaining their existing low levels. This has the potential benefit of ensuring that more land is being managed in a manner that will achieve the water management objectives than would be the case without trading.
54. I consider that there may also be a less tangible benefit arising from trading in terms of the moral hazard that it promotes (as discussed by Mr Day in his evidence). The act of trading may have the effect of raising the awareness of other landowners in the catchment as to their contribution to water quality outcomes and what level of resource they have been allocated. .

13.5 RISKS ASSOCIATED WITH TRADING

55. I have identified the following potential risks of adding trading to the framework proposed by Ms Marr:
 - a. Trading supports actual nitrogen leaching in a catchment reflecting the applicable nitrogen leaching catchment cap. Where a catchment cap is set, trading makes it possible for farms to leach more than their allocation

provided someone else in the catchment is leaching below their allocation. Where there are no barriers to trading, all of the available nitrogen will be used by people who wish to intensify and who are able to purchase the unutilised nitrogen allocation from others in the catchment. Where there is economic benefit from being able to leach nitrogen, most of the available N will be taken up.

- b. Where a catchment cap is set above the level necessary to achieve the water quality outcome (as is the case in Ms Marr's Table 13.2 covering years prior to Year 20), trading may result in N leaching increasing up to the interim catchment cap. This is not such a problem where all of the existing farms are currently operating at or above the interim allocation, but in the case of Horizons where a number of farms will be leaching below their allocation (refer to the evidence of Peter Taylor), the result may be more actual nitrogen is leached as the latent N allocation is taken up by those wishing to maximise leaching (assuming maximising leaching increases economic benefit).
- c. Trading based on N limits that are above the ideal water quality limits would be acceptable if there wasn't intensification from other activities (new activities coming into the catchment that are leaching more than their nitrogen leaching limit). Trading encourages new activities to leach at or above their allocation limit because it allows more nitrogen to be purchased from others in the catchment. The result may be a higher proportion of high-leaching activities in the catchment when compared with a non-trading regime where new land uses are limited to the nitrogen leaching initially allocated. This effect is likely to be greatest on more marginal Class 3 and 4 land where the nitrogen allocation is lower but management inputs can allow for intensive use.

13.5.1 ADDRESSING THE RISKS ASSOCIATED WITH TRADING

- 56. Applying trading to the POP framework proposed by Ms Marr can be achieved in a manner that minimises the risks identified above. The key risk with trading is that it allows actual leaching to increase to above the level that would occur should trading not be in place – it incentivises landowners to sell all of their unused N leaching rights to landowners who wish to use them, thereby potentially driving the catchment's actual leaching up to the catchment cap.

57. With water quality outcomes only likely to be achieved, assuming nitrogen leaching is occurring at the catchment cap, at the Year 20 numbers proposed by Ms Marr, it appears to me that trading must be focussed on those numbers rather than the intermediate numbers (the years between Year 1 and Year 20 of Table 13.2). Regulated (intensive farming) landowners who wish to operate at or above their nitrogen leaching limit can do so via trading only if the unregulated landowner from which the N leaching right are transferred is operating at or below the Year 20 nitrogen leaching limit (accounting for both traded and actual N leaching). In this way, the nitrogen leaching rights transferred only contribute to the *existing intensive farming* land use operating above the Year 20 numbers. The transferring landowner is contributing to advancing the achievement of the water quality outcome because the actual nitrogen leaching from that land will be below the Year 20 limit (worst-case actual leaching will be the land's Year 20 limit minus any transferred N).
58. Where nitrogen is traded between two intensive farming activities (say two dairy farmers), there is not the need for the transferrer to reduce their N leaching below the Year 20 numbers because there is already an expectation in the regulatory framework proposed by Ms Marr that those landowners can increase their N leaching up to their land's limit (worst-case actual leaching will be the lands relevant limit minus any transferred nitrogen). Ms Marr also proposes that new land uses must meet the Year 20 numbers so any trading that occurs involving new land uses is also focussed at the Year 20 numbers.
59. The following simplified example of four landowners (A-D) of equal sized land holdings operating both regulated and unregulated land uses above and below a year 20 target demonstrates the possible outcomes for catchment water quality.

Table 1 – Trading scenarios

Farmer	Intensive farming activity requiring consent?	Regulated N leaching limit at Year n (being a year before year 20)	Year 20 limit	Actual N leaching	N available to trade at Year n
A	Yes	28		25	3
B	Yes	25		32	None
C	No		12	15	None
D	No		27	25	2

60. Scenario 1: No trading occurs. Farmer A is entitled to increase his/her actual leaching by 3kg/yr to meet the Year n limit. Farmer B must reduce his/her actual leaching by 7kg/yr by changing farm management practices or using other on-farm measures. Farmers C and D can continue to operate as they wish as there is no requirement to achieve an N leaching limit. Total N leaching in the catchment = 93kg/yr (A=28, B=25, C=15, D=25)
61. Scenario 2: Farmer A wants to intensify to 35kg/yr. That will mean Farmer A is leaching 7kg/yr over his/her N leaching limit. There is only 2kg/yr of N available to purchase in the catchment (Farmer D). For Farmer A to intensify to that level, one of the other farmers in the catchment will have to reduce their actual leaching below the relevant limit (Year n limit for regulated land uses or Year 20 limit for unregulated land uses). Total N leaching in the catchment = 93kg/yr.
62. Scenario 3: Farmer B wants to minimise the cost of reducing 7kg/yr to achieve his/her Year n limit. He/she could use the lowest cost on-farm measures to reduce 2kg/yr and then pay Farmer A and Farmer D for their un-used N leaching allocation. Alternatively, it might be more cost effective for Farmer B to pay Farmer D to reduce his/her actual leaching by a further 2kg/yr so that Farmer B does not have to undertake any on-farm measures to reduce N leaching. Total N leaching in the catchment = 93kg/yr
63. As can be seen from these scenarios, the various options of trading or no trading result in the same net result in terms of potential nitrogen leaching in the catchment.
64. If, however, Farmer C and D were allowed to trade up to a Year n number (which would be higher than the Year 20 number), there would be an increase in N leaching in the catchment from what could occur under a non-trading regime. While this would be completely equitable between the regulated and non-regulated activities, the result would be a worsening of water quality than what presently exists, which is contrary to achieving the objectives in the POP.
65. Therefore, to address the identified risks of including trading in Ms Marr's proposed plan provisions, I consider that the following criteria must be applied:

- a. Existing intensive (regulated) farming can only transfer Nitrogen loss units to (sell) other land if the net¹⁹ Nitrogen loss from the intensive farm is at or below that land's Year n limit.
- b. New intensive farming (regulated) can only transfer nitrogen loss units to other land if the net Nitrogen loss from the new intensive farm is at or below that land's Year 20 limit.
- c. Non-intensive farming (currently unregulated) can only transfer nitrogen loss units to other land if the net Nitrogen loss from the non-intensive farm is at or below that land's Year 20 limit.

14 PRE-REQUISITES FOR TRADING

66. The evidence of John Ballingall for Fonterra provides a list²⁰ of what he considers to be features of an 'efficient and effective Nitrogen loss trading regime'. The economics experts agreed during conferencing that Mr Ballingall's criteria need to be considered when designing a trading system²¹. The criteria are:
- a. A clearly stated and scientifically well-justified cap on Nitrogen loss;
 - b. A definable unit of Nitrogen loss entering the relevant water body (with due adjustment for equivalency between that entering at upstream and downstream locations) that can be monitored and made subject to trade;
 - c. A mechanism for distributing entitlements under the cap to those who need it, which may involve auctioning or sale of units or grand-parenting allocations in proportion to existing records of Nitrogen loss;
 - d. A sufficiently wide market of potential participants to enable trade and exchange to emerge at least cost;
 - e. Institutional arrangements in place to register entitlements, monitor transactions and reconcile market activity and physical inventory changes; and

¹⁹ accounts for both traded and actual nitrogen leaching

²⁰ See para 111, pg 22 of John Ballingall evidence

²¹ See point 7 of the Record of Economics expert conferencing

f. Buy-in from stakeholders, including local government, those being regulated, other water users, and other stakeholders.

67. Mr Ballingall's criteria generally agree with what I found to be the prerequisites for nutrient trading based on my examination of other trading schemes in New Zealand and internationally, albeit those schemes are different to the trading approach I am proposing here.

68. I address each of Mr Ballingall's criteria in the following sections.

14.1 A CAP ON NITROGEN LOSS (CRITERIA (A))

69. Mr Ballingall refers in his evidence to a Nitrogen loss cap as one of the features of a trading regime. In my view, this component of a trading regime is a little wider than just a cap. Setting a cap requires an understanding of the capacity of the natural resource in question; in this case the capacity of freshwater to assimilate Nitrogen inputs. Once the limit of the natural resource is known, a cap (or caps) can be set to define the contribution that certain activities can make to the natural resource limit including farming, urban discharge and industry. For example, the natural resource limit may be higher than a particular N loss cap that is set for particular land uses but in setting the cap account has been taken of the other users of the natural resource (e.g. the receiving water body may be able to assimilate 200 tonnes of nitrogen per year so 100 tonnes is allocated to one particular land use with the remaining 100 tonnes allocated to others). Failure to base a cap accounting for all users of the resource risks a cap being set at an incorrect level with potential implications on the access rights and uses that others have to the resource.

70. Mr Day describes in his evidence²² the situation where a disproportionate N loss right has been allocated to one set of landowners (existing dairy) in the catchment through the DV, which has consequential implications for the rights other currently unallocated land users have to the resource. While the DV does not set a cap as such, it provides an example where an allocation of a resource has not taken into account the rights others may have to that resource. Therefore, it is my view that in defining a cap on N loss, the first step is defining what the natural resource limit is and then determining an equitable cap on that

²² See Section 6 of the evidence of Andrew Day

basis. Based on Ms Marr's planning analysis, this has been done in setting the LUC numbers in the NV Table 13.2 (and also in Table 13.2 in her recommended provisions).

71. The reducing cap for intensive land uses works towards an ultimate cap where water quality decline is halted and, ultimately, water quality improvement is achieved (approximately the Year 20 numbers in Table 13.2) while allowing for economic development to continue.
72. The LUC method used essentially applies reductions across the catchment and to all land regardless of land use. Therefore the cap that is set by the LUC allocation in Table 13.2 accounts for the resource limit and the users of the resource.
73. On the basis that a cap accounting for resource limits and resource users is in place, the next step in analysis is whether the cap is 'scientifically well-justified'. Based on my analysis of the technical evidence, it is my view that the caps have been developed with a scientific underpinning and they are well justified²³. There have been a number of assumptions involved in the science, including assumptions on the assimilation of N that is occurring in the rivers, land use intensification scenarios, and others. However it appears to me that there has been rigorous consideration of the various factors that contribute to water quality. Based in particular on the evidence of Olivier Ausseil, there appears to be a clear scientific relationship between land use practices and water quality.
74. I therefore conclude that the year 20 figures within Table 13.2 provides a clearly stated and scientifically well justified cap for Nitrogen loss, and that the pre-Year 20 numbers in Table 13.2 perform the role of interim caps.

14.2 A DEFINABLE UNIT OF NITROGEN LOSS (CRITERIA (B))

75. Mr Ballingall's criteria state 'A definable unit of Nitrogen loss entering the relevant water body (with due adjustment for equivalency between that entering at upstream and downstream locations) that can be monitored and made subject to trade' is a requirement of a Nitrogen trading system. This criteria suggests that the unit of Nitrogen loss needs to be the amount of Nitrogen entering the

²³ In particular I note the evidence of Dr Ausseil who has undertaken detailed analysis of the implications of different nitrogen leaching scenarios on nutrient loads in the receiving water bodies.

relevant water body. Although there is increasing knowledge of groundwater lags, river-groundwater interactions and a number of other factors to be able to accurately model how much Nitrogen is entering catchments, to extend this level of measurement to individual farms is unlikely to be efficient. I do not consider that this is actually necessary where the trading regime is being designed to minimise costs rather than as the primary tool for achieving water quality outcomes in the receiving water body (as it is in the Lake Taupo catchment).

76. What is actually required could perhaps be rephrased as *a definable unit of Nitrogen loss leaving a parcel of land that can be monitored and made subject to trade*. The presumption in the rephrased criteria is that Nitrogen that is lost from land is entering the environment and is contributing to Nitrogen loads in the receiving water body. Mr Ballingall's criteria is, as I understand it, intended to ensure that each landowner's contribution to Nitrogen load in the receiving water body is measured and recorded in the same way so that variabilities in measurement do not result in unfair allocation of Nitrogen loss rights. It appears to me that this same certainty can be achieved by using a consistent method for measuring, monitoring and recording outputs from the land, which removes the complexity of having to understand how the transfer from the land to the water body occurs in each case.
77. In the case of the POP policy approach proposed by Ms Marr, the Nitrogen loss from land is measured consistently using the Overseer model as kg of N/ha/year.
78. The use of Overseer to consistently model the units (kg/ha/year) of Nitrogen lost from a particular parcel of land is, in my view, suitable to achieve this criteria for trading. The technical conferencing statement from the science experts on this topic states that they agree that Overseer is the appropriate tool²⁴.

14.3 A MECHANISM FOR DISTRIBUTING ENTITLEMENTS (CRITERIA (C))

79. A mechanism for distributing entitlements under the cap to those who need it, which may involve auctioning or sale of units or grand-parenting allocations in proportion to existing records of Nitrogen loss

²⁴ See Point 10 of the Record of Technical Conferencing on LUC/Best Practice Sub-topic

80. Mr Ballingall's criteria includes a brief description of some methods for allocating Nitrogen leaching entitlements to those who need it, however he does not include the LUC distribution approach that was included in the NV and is also proposed by Ms Marr. At paragraph 112.3, Mr Ballingall mentions LUC in the context of this trading criteria, but seems to dismiss it on the basis that there is no reference to grand parenting or auctioning of allowances (which I assume is in relation to his evaluation of Ms Barton's inclusion of reference to trading in her proposed policies).
81. In my view, while there may be some criticism of the LUC approach to distributing Nitrogen leaching units to land, Ms Marr has evaluated it to be the most appropriate methodology to use in the POP and I agree with her evaluation. If the LUC approach is used in the POP as the allocation method, the question then is whether it can be used in the context of trading. I consider that it can because it allocates an initial nitrogen leaching entitlement (measured in kilograms of nitrogen per year) to all land (regulated or not) and therefore all land in the potential Nitrogen trading market has been allocated nitrogen leaching rights on the same basis.
82. Following the initial allocation, nitrogen leaching units can then be traded between landowners in the same catchment, with the monitoring of the trades being achieved through the resource consent process (see Section 14.4 below)
83. Despite its potential limitations, LUC allocation allows all landowners to determine what their Nitrogen leaching allocation is at any point in time, and all landowners in the catchment are using the same methodology.
84. In my view, this criterion for trading is satisfied.

14.4 A SUFFICIENTLY WIDE MARKET (CRITERIA (D))

85. As discussed later in my evidence at Section 14.6, nitrogen transfers under the trading regime I propose is an 'opt-in' approach, whereby nitrogen trades will only occur in circumstance where two or more landowners have the desire to trade. Therefore, a large market is not necessarily required other than that there need to be landowners who wish to purchase nitrogen leaching rights and other landowners who have nitrogen leaching rights available (or are willing to modify their practices to make them available).

86. The market that is proposed in this case is all land within each regulated water management subzone. As water quality in a particular water body is primarily influenced by discharges from land within the catchment of that water body, the nitrogen leaching cap applicable to that water body needs to apply to its catchment only. Therefore, for trading to establish in any particular water management subzone, there will need to be one or more landowners who are able to operate their activities below their nitrogen leaching limit for their land. Where all landowners in a catchment are operating at or above their nitrogen leaching limit, there will not be any nitrogen available to trade and therefore trading will not take place. However this is not a critical flaw in the trading regime proposed, as trading is only offered as a means by which nitrogen leaching limits can be achieved at least cost. Where there no nitrogen available in the catchment, all nitrogen leaching limits will need to be met on-farm.
87. For the proposed trading regime I propose, I consider that a sufficiently wide market will establish itself if the benefits of trading to potential buyers and sellers become apparent. As discussed previously in my evidence the potential for trading is likely to trigger conversations within catchment communities, with more opportunities for trading developing as conversation widen and initial trading transactions occur. I have not attempted to identify what the cost of individual transactions might be nor what the price of a unit of nitrogen might be. With an opt-in trading system, the market that develops will naturally set its own price for nitrogen units.
88. Overall, I consider that this criteria is achieved by the proposed trading regime, on the basis that where there is a recognised benefit to trading within a catchment, a sufficiently large market will establish so that the economic benefits of trading increase.

14.5 METHOD FOR RECORDING TRANSACTIONS (CRITERIA (E))

89. Methods for recording transactions between landowners trading Nitrogen loss units are various, and appear to be developed to be the most appropriate for the particular trading regime proposed. In the case of trading regimes that are largely standalone (have limited requirement for interaction with the local authority), the method for recording transactions needs to be properly designed and operated and, I suspect, would be relatively complex. Such an approach

would require the means to verify Nitrogen leaching units available, to record the actual transactions, and to enable price setting.

90. However, where there is already a requirement for interaction with the local authority as part of the regulatory regime, a simpler transaction recording system using the resource consent process is therefore available. In the regulatory approach proposed by Ms Marr all landowners wishing to undertake intensive farming need to obtain resource consent to demonstrate that they are achieving their Nitrogen leaching limit. A resource consent is an appropriate way to record Nitrogen leaching rights and actual nitrogen leaching, and therefore would provide a means to record any nitrogen leaching rights that have been attributed to another landowner. Where Nitrogen leaching unit transactions are occurring only between intensive farming activities (regulated activities), then, provided both parties involved in the transaction had the transaction recorded on their resource consents, that would provide a robust transaction recording system. Any amendments to the transaction (say a landowner only wanted to use the units for 2 years) could be recorded by relatively simple changes to consent conditions on both resource consents.
91. In my view, it would add to the efficiency of the trading system if landowners that are not currently required to obtain resource consent to leaching Nitrogen could also trade. This could be achieved by including a rule in the Plan that requires any landowner wishing to transfer Nitrogen leaching units to another landowner to obtain a resource consent in order to record that transaction. See Appendix 1 of my evidence which sets out recommended plan provisions.
92. Requiring other landowners to obtain resource consent if they wish to transfer Nitrogen loss rights to others would also be necessary to ensure that the units are actually available to trade and that the pre-requisites for establishing the N loss entitlement are in place. Therefore, the same performance standards that apply to intensive land use activities should also apply to other landowners transferring nitrogen leaching rights.
93. In my view, this recording system is simple and utilises an existing regulatory method. It does involve additional cost for non-intensive landowners to obtain resource consent but that cost would logically be built into the price paid by the landowner receiving the Nitrogen loss unit benefit. It is also important to

acknowledge that the resource consent cost is optional for non-intensive landowners as they are not compelled to trade their Nitrogen loss units.

94. In order for parties trading nitrogen leaching rights to be on 'an even playing field', it is necessary that all parties are undertaking their activities according to a consistent set of regulatory standards that are enforceable. Without such standards, there is likely to be variability in actual leaching versus claimed leaching which has consequential implications both for the equity of trades but also impacts on the achievement of water quality outcomes.
95. Ms Marr's proposed provisions set the relevant standards which landowners must comply with in terms of recording and managing their nutrient discharges. This includes a set of standards set out in the relevant rules, but also the requirements around the preparation and implementation of nutrient management plans. The nutrient management plans rely on the use of the Overseer model, which has a set of prerequisites for its proper use. The rigour in relation to compliance using Overseer is achieved both through the resource consent process (the Overseer files are able to be audited by the Council) and through the requirement that the nutrient management plans must be prepared by people who are properly trained and qualified in the use of Overseer.
96. In my view, these requirements establish a robust and enforceable system for creating consistency across all parties involved in nitrogen leaching transfers and therefore there is a clear baseline for compliance. Actual compliance relies on both landowner intent and the Council's monitoring and compliance practices, however I have assumed for the purpose of this analysis that both landowners and the Council are performing their roles properly.

14.6 STAKEHOLDER BUY-IN (CRITERIA (F))

97. Trading regimes that are used as the primary mechanism for managing and reducing nutrient discharges would require buy-in from all of the relevant stakeholders in order to operate properly. For example, trading regimes that rely on nitrogen units to be purchased from the market by a non-farming entity as a mechanism for reducing the total amount of nitrogen leaching units available in the catchment would require sufficient funding from government and other bodies to operate. Failure of the organisations funding such a mechanism would mean that the trading regime would fail to operate as intended.

98. In the case of the management approach proposed by Ms Marr, the primary mechanism for addressing nitrogen leaching is a property-specific limit imposed by resource consent. Trading is not the primary mechanism. Therefore, there is not a high requirement for buy-in from stakeholders as there is in the previous example. The stakeholders involved in the POP regime are the landowners involved in the trading transaction, and Horizons as the consent authority (recording, monitoring and compliance only). Therefore, trading in the POP context will occur provided that there are two or more landowners who are prepared to undertake a trade, and the regulatory framework is set up to enable the transaction to be recorded and monitored. There is not a requirement for third-party funding, nor is there a requirement for all landowners to want to trade nitrogen. Trading will only occur (and only needs to occur) between willing individuals.
99. It is my view that the requirement for stakeholder buy-in is not essential for the nitrogen trading regime I propose here to be effective. It is an 'opt-in' trading system and therefore only needs buy-in from individuals who consider they will benefit from it.

14.7 CONCLUSION

100. Based on my evaluation above, I am of the opinion that a trading regime is able to be established to fit into the policy and regulatory framework proposed by Ms Marr such that it meets all of the criteria identified by Mr Ballingall. I propose a set of provisions in Appendix 1 of my evidence which adapt the plan provisions Ms Marr recommends in her evidence in order to provide for trading. In those amended provisions, I have added the following:
- a. A new Policy 6-7(d) which provides scope for nitrogen trading at the RPS level, and which also provides scope for the RP to define the parameters applicable to the regulation of nitrogen trading.
 - b. A new Policy 13-2D(d) that provides for an exception to land use activities having to meet their applicable cumulative nitrogen leaching maximum. This subclause references a new Policy 13-2E.
 - c. A new Policy 13-2E that sets out the requirements for providing for trading between landowners. This policy directs the Regional Council in terms of the core criteria for managing trading through the resource consents.

- d. A new Rule 13-1X that requires people using land for non intensive land use activities and wishing to trade any unused nitrogen allocation to obtain a controlled activity resource consent. This new rule includes the same conditions/standards/terms as the controlled activity rules for intensive land use activities.
- e. Other minor adjustments to policies and rules to provide for nitrogen trading to be used as a means of intensive farming activities achieving their cumulative nitrogen leaching maximum.

15 SPECIFICS OF A TRADING REGIME FOR THE POP

101. Based on the evaluation I have undertaken above, I set out in this section what I consider to be the requirements and essential components of a trading regime that would integrate with the planning provisions Ms Marr has recommended in her evidence.
- a. The transfer of nitrogen leaching rights from one landowner to another can only occur in the same water management sub-zone, so that the total amount of nitrogen leaching within the catchment remains the same.
 - b. All landowners involved in transferring nitrogen leaching rights must base their nitrogen leaching around the nitrogen leaching limit set for their land. In the case of land use activities that are not otherwise regulated (non intensive farming activities), the nitrogen leaching limit that they must use is the Year 20 number as derived from Table 13.2. New intensive farming activities must also use the Year 20 number. Existing intensive farming activities must use the Table 13.2 number applicable to the year in which the transfer will occur.
 - c. The term (timeframe) for trades must correspond with the expiry date of the resource consents that secure them. This is for two reasons. Firstly, the nitrogen transfer requires both parties to have the transfer secured in a resource consent so if one consent expires the transfer no longer applies. Secondly, resource consent terms must be aligned with the common catchment expiry dates for the applicable catchments, which provides an opportunity for any adjustments to the nitrogen leaching cap established in Table 13.2 to be undertaken in a comprehensive manner.

- d. All landowners who are transferring nitrogen must meet the same standards in terms of other aspects that influence discharges of contaminants to water, and which are pre-requisites for the effective operation of the Overseer model. The Overseer model, being the tool that enables consistent identification and monitoring of nitrogen leaching from land, must be applied consistently across all trading land to ensure equity.

16 CONCLUSIONS

102. In this brief of evidence, I have examined the opportunity and applicability of adding a nutrient trading capability to the POP planning framework recommended by Ms Marr. The basis of my evaluation of the requirements for trading has relied on the evidence of the economics technical evidence provided by the appeal parties to date, and also my examination of literature on the issue of nutrient trading.
103. Based on this evaluation, I am of the opinion that trading can be included in the planning framework proposed by Ms Marr. The trading approach that I have recommended is an 'opt-in' variant and is designed to provide landowners with another option for achieving the nitrogen leaching limit applied to their land.



Phillip Percy

17 APPENDIX 1 – RECOMMENDED PLAN PROVISIONS

The provisions **highlighted in blue** below are added to make provision for nitrogen trading. The planning provisions proposed by Ms Marr in her evidence have been used as a base.

Track changes shown in **grey highlight** are changes considered to be agreed in mediation but which do not form part of the recommendations of this evidence. Some parts of the Chapter not relevant to these proceedings are not shown in this version of Chapter 6.

Track changes shown in **blue highlight** are changes proposed to provide for nitrogen trading

18 Water

6.1 Scope and Background

6.1.1 Scope

This chapter addresses the management of fresh water in the Region. It covers:

- **Water Management Zones* and Sub-zones* and Values** - the establishment of *Water Management Zones** and *Sub-zones** and associated water management Values for each *Sub-zone**, for the purpose of managing water quality, water quantity and activities in the beds of rivers and lakes.
- **Surface water quality** - the establishment of water quality targets for rivers and lakes, in order to give effect to the Values, together with a policy regime of maintaining water quality in those *Water Management Sub-zones** that meet their water quality targets, and improving water quality over time in those *Water Management Sub-zones** that do not.
- **Groundwater quality** - the maintenance of existing groundwater quality and its improvement where it is degraded.
- **Discharges and land use activities affecting water quality** - the management of discharges into surface water, discharges onto or into land, and diffuse run-off and other land use activities affecting surface water and groundwater quality.
- **Surface water quantity and allocation** - the establishment of minimum flows and allocation regimes for rivers, and the management of water takes and other activities affecting surface water quantity.
- **Groundwater quantity and allocation, and bores*** - the establishment of *Groundwater Management Zones**, identification of the respective allocable volumes and the active management of groundwater takes.
- **Beds of rivers and lakes** - the management of activities that disturb the beds of rivers and lakes, the management of existing and new structures in the beds of rivers and lakes, and the establishment of sustainable gravel extraction limits for rivers.
- **Land adjacent to the beds of rivers and lakes** - the management of some activities in relation to flood control or drainage purposes.

The effects of hill country erosion on water quality are addressed in Chapter 5. The ecological impacts of takes, diversions, discharges and drainage on *rare habitats**, *threatened habitats** and *at-risk habitats** are addressed in Chapter 7.

6.1.2 Overview

Water is critical for life to exist. People living in the Region enjoy a temperate climate, a large number of rivers, streams and lakes and an extensive groundwater system. The Region does not experience the severity of droughts that impact on some other parts of New Zealand and generally there is enough water to meet everyone's needs. People have grown up with an expectation of access to clean, safe water. But ready access means that water has not always been valued highly. The health of the surface water resource has steadily declined in most catchments as a result.

Despite this decline, there has been a revolution around water in the past few decades. In response to public concerns, significant improvements have been made to the quality of discharges from towns and industrial *sites**. For example, untreated sewage is no longer discharged directly into water bodies, and rivers no longer receive blood discharged from freezing works. Many former discharges to water, particularly discharges of dairy shed effluent, are now discharged to land. New large water takes, such as those associated with hydroelectric development, are carefully managed to ensure that the downstream needs of people and ecosystems are catered for. Although there have been substantial improvements in the quality of point source discharges to water, improvement is still possible and is necessary.

There has been a substantial intensification within the agricultural sector in recent years. This has contributed to a vibrant and booming regional economy but has also increased pressure on the Region's water resources. There has been a significant increase in irrigation demand and the amount of nutrients leaching to surface water and groundwater. Although the impacts of agricultural intensification are less obvious than those caused by the major point source discharges and abstractions mentioned above, they have increased progressively over time.

As the Region has grown, we have significantly altered the physical nature of many of its water bodies and their beds with structures, drainage and flood protection works, particularly in the Manawatu Plains. These changes have lead to a poor and declining state of physical health in the Region's water bodies and their beds.

The impact of discharges and run-off on water quality and the increasing demand for water abstraction are two of the four most critical issues addressed in this Plan.

6.1.3 Water Quantity

[not shown]

6.1.4 Water Quality

There is significant variation in water quality across the Region. Rivers (including streams) emerging from the mountains or areas that have retained their original vegetation cover tend to have very good water

quality. The one exception to this is the Whangaehu River, which flows from the crater lake on Mt Ruapehu. It is naturally acidic and contains high levels of sulphur and heavy metals.

As rivers flow towards the sea, they pick up sediment and nutrients from the surrounding land. As would be expected, water quality in the lower reaches of rivers and streams is poorer than in the headwaters.

In the past, the biggest threats to water quality were municipal (eg., sewage), industrial (eg., meat works and fellmongers) and agricultural (dairy shed effluent) discharges. Although considerable improvements have been made to discharges to water, further improvement is still possible and necessary.

The intensification in agriculture during the past 10 to 15 years has been especially marked in the dairy sector. Raising stock numbers increases the quantity of dairy shed effluent requiring disposal, the quantity of stock urine produced (a concentrated source of nutrients), and the opportunities for stock to access water bodies and their beds. The agricultural sector is recognising the impact it is having on the nation's water bodies and has started to act. The dairy sector was the first to respond, with the Dairying and Clean Streams Accord (an agreement between Fonterra, the Ministry for the Environment, Regional Councils and others on an approach to enhance water quality). Such voluntary approaches are one way of lowering nutrient and faecal levels in the Region's water bodies and the Regional Council supports them, although further improvements are needed. Further improvements will require a mix of regulatory and non-regulatory approaches, that may alter over time.

Groundwater quality within the Region varies according to both depth and location. Generally, deeper groundwater is of higher quality. For example, shallow groundwater within the Horowhenua District near Levin has high concentrations of nitrates, which are believed to be the result of septic tank discharges and *fertiliser** use on market gardens. There have been no significant changes in groundwater quality over the length of the Regional Council's monitoring record (more than 15 years). There is no evidence that groundwater quality is deteriorating.

The overall state of fresh water quality in the Region is as follows:

- (a) The middle reaches of many rivers are unsafe to swim in because of bacterial contamination, or are unpleasant to swim in because of slime (periphyton) growth (Figure 6.1). Elevated nitrate and phosphate levels promote slime growth. The slime also impacts on fish and instream invertebrate communities.
- (b) The lower reaches of many rivers have high concentrations of bacteria, nitrates, phosphates and sediments, and these levels are increasing.
- (c) There is minimal contamination of surface water from heavy metals, hydrocarbons and other toxic substances.
- (d) The quality of groundwater in the Region is generally suitable for stock needs and irrigation, with a low sodium hazard and a low-medium salinity hazard.

- (e) Nitrate levels are high in shallow groundwater in parts of the Region, but the levels have not changed during the period of monitoring.
- (f) Groundwater is free of herbicides and pesticides.

Figure 6.1 [not shown]

6.1.5 Beds of Rivers and Lakes

[not shown]

6.2 Significant Resource Management Issues

Issue 6-1: Water quality

The quality of many rivers and lakes in the Region has declined to the point that ecological values are compromised and contact recreation such as swimming is considered unsafe. The principal causes of this degradation are:

- (a) nutrient enrichment caused by run-off and leaching from agricultural land, discharges of treated wastewater, and septic tanks
- (b) high turbidity and sediment loads caused by land erosion, river channel erosion, run-off from agricultural land and discharges of stormwater
- (c) pathogens from agricultural run-off, urban run-off, discharges of sewage, direct stock access to water bodies and their beds and discharges of agricultural and industrial waste*.

Shallow groundwater in areas of intensive ~~rural subdivision and horticulture land use~~ in the Horowhenua and Tararua Districts has elevated nitrate levels in excess of the New Zealand drinking water standard. However, the quality of groundwater in the Region is generally suitable for stock needs and irrigation, and there has been no evidence of deteriorating groundwater quality during the past 15 years.

Issue 6-2 and Issue 6-3 not included

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6.3 Objectives

Objective 6-1: *Water*[^] management Values

Surface *water bodies*[^] and their *beds*[^] are managed in a manner which safe guards their life supporting capacity and advances the achievement [1] of the Values ~~has regard to the Values in Schedule AB~~²⁵.

²⁵ Schedule AB is not a component of Part I - the Regional Policy Statement. It is a component of Part II - the Regional Plan.

Objective 6-2: *Water*[^] quality

- (a) Surface *water*[^] quality is managed to ensure that:
- (i) *water*[^] quality is maintained in those *rivers*[^] and *lakes*[^] where the existing *water*[^] quality is at a level sufficient to support the Values in Schedule AB
 - (ii) *water*[^] quality is enhanced in those *rivers*[^] and *lakes*[^] where the existing *water*[^] quality is not at a level sufficient to support the Values in Schedule AB
 - (iii) accelerated eutrophication and sedimentation of *lakes*[^] in the Region is prevented or minimised
 - (iv) the special values of *rivers*[^] protected by *water conservation orders*[^] are maintained.
- (b) Groundwater quality is managed to ensure that existing groundwater quality is maintained, or enhanced where it is degraded/ over allocated as a result of human activity, groundwater quality is enhanced.

Objective 6-3 and 6-4 not shown

6.4 Policies

6.4.1 Water Management Framework

Policy 6-1: *Water Management Zones*^{*} and Values

For the purposes of managing *water*[^] quality, *water*[^] quantity, and activities in the *beds*[^] of *rivers*[^] and *lakes*[^], the catchments in the Region have been divided into *Water Management Zones*^{*} and *Water Management Sub-zones*^{*} in Schedule AA.²⁶ Groundwater has been divided into *Groundwater Management Zones*^{*} in Schedule C.²⁷

The *rivers*[^] and *lakes*[^] and their *beds*[^] must be managed in a manner which safeguards their life supporting capacity and has regard to advances the achievement of the Schedule AB Values when decisions are made on avoiding, remedying or mitigating the adverse *effects*[^] of activities or in relation to any other function under the Resource Management Act 1991 exercised by the Regional Council or Territorial Authorities. The individual Values and their associated management objectives are set out in the Schedule AB Surface Water Management Values Key and repeated in Table 6.2.

~~*Water Management Zones*^{*} and *Water Management Sub-zones*^{*} throughout the Region (and particularly those with good head and flow available) may have potential for hydroelectricity generation. Further *site*^{*}-specific assessment will be needed to establish the locations where such potential may be realised while having regard to the Schedule AB Values of the relevant *water bodies*[^] and their *beds*[^].~~

²⁶ Schedule AA is not a component of Part I - the Regional Policy Statement. It is a component of Part II - the Regional Plan.

²⁷ Schedule C is not a component of Part I - the Regional Policy Statement. It is a component of Part II - the Regional Plan.

Table 6.2 Surface *Water*[^] Management Values and Management Objectives

Value Group	Individual Values	Management Objective	
Ecosystem Values	NS	Natural State	The <i>river</i> [^] and its <i>bed</i> [^] are maintained in their natural state
	LSC	Life-supporting Capacity	The <i>water body</i> [^] and its <i>bed</i> [^] support healthy aquatic life / ecosystems
	SOS-A	Sites of Significance - Aquatic	Sites of significance for indigenous aquatic biodiversity are maintained or enhanced
	SOS-R	Sites of Significance - Riparian	Sites of significance for indigenous riparian biodiversity are maintained or enhanced
	IS	Inanga Spawning	The <i>water body</i> [^] and its <i>bed</i> [^] sustain healthy inanga spawning and egg development
	WM	<i>Whitebait</i> [*] Migration	The <i>water body</i> [^] and its <i>bed</i> [^] are maintained or enhanced to provide safe passage of inwardly migrating juvenile native fish known collectively as <i>whitebait</i> [*]
Recreational and Cultural Values	CR	Contact Recreation	The <i>water body</i> [^] and its <i>bed</i> [^] are suitable for contact recreation
	AM	<i>Amenity</i>	The amenity values of the <i>water body</i> [^] and its <i>bed</i> [^] (and its margins where in public ownership) are maintained or enhanced
	MAU	<i>Mauri</i> [*]	The <i>mauri</i> [*] of the <i>water body</i> [^] and its <i>bed</i> [^] is maintained or enhanced
	SOS-C	Sites of Significance - Cultural	Sites of significance for cultural values are maintained
	TF	Trout Fishery	The <i>water body</i> [^] and its <i>bed</i> [^] sustain healthy rainbow or brown trout fisheries
	TS	Trout Spawning	The <i>water body</i> [^] and its <i>bed</i> [^] meet the requirements of rainbow and brown trout spawning and larval and fry development
	AE	Aesthetics	The aesthetic values of the <i>water body</i> [^] and its <i>bed</i> [^] are maintained or enhanced
Water[^] Use	WS	<i>Water</i> [^] Supply	The <i>water</i> [^] is suitable, after treatment, as a drinking <i>water</i> [^] source for human consumption
	IA	Industrial Abstraction	The <i>water</i> [^] is suitable as a <i>water</i> [^] source for industrial abstraction or use, including for hydroelectricity generation
	I	Irrigation	The <i>water</i> [^] is suitable as a <i>water</i> [^] source for irrigation
	SW	Stockwater	The <i>water</i> [^] is suitable as a supply of drinking <i>water</i> [^] for livestock
Social/ Economic Values	CAP	Capacity to Assimilate Pollution	The capacity of a <i>water body</i> [^] and its <i>bed</i> [^] to assimilate pollution is not exceeded
	FC/D	Flood Control and Drainage	The integrity of existing flood and <i>river</i> [^] bank erosion protection <i>structures</i> [^] and existing drainage <i>structures</i> [^] is not compromised and the risks associated with flooding and erosion are managed sustainably
	EI	Existing <i>Infrastructure</i> [^]	The integrity of existing <i>infrastructure</i> [^] is not compromised

^{*} *Water Management Zones*^{*} and *Water Management Sub-zones*^{*} throughout the Region (and particularly those with good head and flow available) may have potential for hydroelectricity generation. Further *site*^{*}-specific assessment will be needed to establish the locations where such potential may be realised while having regard to the Schedule AB Values of the relevant *water bodies*[^] and their *beds*[^].

6.4.2 Water Quality

6.4.2.1 Surface Water Quality

Policy 6-2: ~~Water~~[^] quality ~~targets~~ limits

In Schedule D²⁸, ~~water~~[^] quality ~~targets~~ limits relating to the Schedule AB Values (repeated in Table 6.2) are identified for each *Water Management Sub-Zone*^{*}. Other than where they are incorporated into *permitted activity*[^] rules as *conditions*[^] to be met, the ~~water~~[^] quality ~~targets~~ limits in Schedule D must be used to inform the management of surface ~~water~~[^] quality in the manner set out in Policies 6-3, 6-4 and 6-5.

Policy 6-3: Ongoing compliance where ~~water~~[^] quality ~~targets~~ limits are met

- (a) ~~In each case w~~Where the existing ~~water~~[^] quality meets the relevant Schedule D ~~water~~[^] quality ~~targets~~ limits within a *Water Management Sub-zone*^{*}, ~~activities~~ water quality must be managed in a manner which ensures that the ~~water~~[^] quality ~~targets~~ numerics continue to be met beyond the zone of reasonable mixing (where mixing is applicable).
- (b) For the avoidance of doubt:
- (i) in circumstances where the existing ~~water~~[^] quality of a *Water Management Sub-zone*^{*} meets all of the ~~water~~[^] quality ~~targets~~ limits for the *Sub-zone*^{*} (a) applies to every ~~water~~[^] quality ~~targets~~ limits for the *Sub-zone*^{*}
 - (ii) in circumstances where the existing ~~water~~[^] quality of a *Water Management Sub-zone*^{*} meets some of the ~~water~~[^] quality ~~targets~~ limits for the *Sub-zone*^{*} (a) applies only to those ~~targets~~ limits that are met.
 - (iii) For the purpose of (a) reasonable mixing is only applicable to a ~~discharge~~[^] from an identifiable location.

Policy 6-4: Enhancement where ~~water~~[^] quality ~~targets~~ limits are not met

- (a) ~~In each case w~~Where the existing ~~water~~[^] quality does not meet the relevant Schedule D ~~water~~[^] quality ~~targets~~ limits within a *Water Management Sub-zone*^{*}, ~~activities~~ must be managed in a manner which, beyond the zone of reasonable mixing ~~water~~[^] quality within that sub-zone must be managed in a manner that enhances existing ~~water~~[^] quality in order to meet:
- (i) ~~enhances existing~~ ~~water~~[^] quality where that is reasonably practicable, or otherwise maintains it, and
 - (ii) the water quality limits for the Water Management Zone in Schedule D; or
 - (iia) the relevant Schedule AB Values and management objectives that the water quality limits is designed to safeguard

²⁸ Schedule D is not a component of Part I - the Regional Policy Statement. It is a component of Part II - the Regional Plan.

- (iii) ~~has regard to the likely effect[^] of the activity on the relevant Schedule AB Value that the water[^] quality target is designed to safeguard.~~
- (b) For the avoidance of doubt:
 - (i) in circumstances where the existing water[^] quality of a *Water Management Sub-zone*^{*} does not meet all of the water[^] quality ~~targets~~ limits for the *Sub-zone*^{*}, (a) applies to every water[^] quality ~~target~~ limits for the *Sub-zone*
 - (ii) in circumstances where the existing water[^] quality of a *Water Management Sub-zone*^{*} does not meet some of the water[^] quality ~~targets~~ limits for the *Sub-zone*^{*}, (a) applies only to those ~~targets~~ limits not met.

Policy 6-5: Management of ~~activities~~ water[^] quality in areas where existing water[^] quality is unknown

- (a) ~~In each case w~~Where there is insufficient data to enable a comparison of the existing water[^] quality with the relevant Schedule D water[^] quality ~~targets~~ limits, ~~activities~~ water[^] quality within the *Water Management Sub-Zone*[^] must be managed in a manner which, ~~beyond the zone of reasonable mixing~~:
 - (i) maintains or enhances the existing water[^] quality
 - (ii) has regard to the likely effect of the activity on the relevant Schedule AB Values that the water[^] quality ~~target~~ limits is designed to safeguard
 - (iii) has regard to relevant information about the existing water[^] quality in upstream or downstream *Water Management Sub-zones*^{*}, where such information exists.
- (b) For the avoidance of doubt:
 - (i) in circumstances where there is insufficient data to enable a comparison of the existing water[^] quality with all of the water[^] quality ~~targets~~ limits for a *Water Management Sub-zone*^{*} (a) applies to every water[^] quality ~~target~~ limits for the *Sub-zone*^{*}
 - (ii) in circumstances where there is insufficient data to enable a comparison of the existing water[^] quality with some of the water[^] quality ~~targets~~ limits for a *Water Management Sub-zone*^{*} (a) applies only to those ~~targets~~ limits with insufficient data.

6.4.2.2 Groundwater Quality

Policy 6-6: Maintenance of groundwater quality

- (a) *Discharges*[^] and *land*[^] use activities must be managed in a manner which maintains the existing groundwater quality, or where groundwater quality is degraded as a result of human activity, it is enhanced ~~it where it is degraded.~~
- (aa) An exception may be made under (a) where a *discharge*[^] onto or into *land*[^] better meets the purpose of the RMA than a *discharge*[^]

to *water*[^], provided that the *best practicable option*[^] is adopted for the treatment and *discharge*[^] system.

- (b) Groundwater takes in the vicinity of the coast must be managed in a manner which avoids saltwater intrusion.

6.4.2.3

Discharges and Land use Activities Affecting Water Quality

Policy 6-X: *Land*[^] use activities affecting groundwater and surface *water*[^] quality

The management of land use activities affecting groundwater and surface water must give effect to the strategy for surface water quality set out in Policies 6-2, 6-3, 6-4 and 6-5, and the strategy for groundwater quality in Policy 6-6, by managing diffuse discharges of contaminants in the following manner:

- (a) identifying in the regional plan targeted *Water Management Sub-zones*^{*}. Targeted *Water Management Sub-zones*^{*} are those subzones where, collectively, *land*[^] use activities are significant contributors to elevated contaminant levels in groundwater or surface *water*[^].
- (b) Identifying in the regional plan intensive farming land use activities. Intensive land use activities are rural land use activities that (either individually or collectively) make a significant contribution to elevated contaminant levels in the targeted water management sub-zones identified in (a) above.
- (c) Actively managing the intensive farming land use activities identified in (b), including through regulation in the regional plan in the manner specified in Policy 6-7
- (d) The Regional Council must continue to monitor ground and surface water quality in water management sub-zones not identified in (a) and land uses not identified in (b). Where monitoring shows the thresholds in (a) and (b) are met then the regional plan must be amended so that those further water management sub-zones and rural land uses are included in the management regime set out in (c)

Policy 6-7: Regulation of intensive farming *land*[^] use activities affecting groundwater and surface *water*[^] quality

(a) **Nutrients**

- (i) Nitrogen leaching maximums must be established in the regional plan which:
 - i. Take into account all the non-point sources of nitrogen in the catchment and
 - ii. Will achieve the strategies for surface water quality and result in a maintenance of water quality water quality set out in Policies 6-2, 6-3, 6-4 and 6-5, and the strategy for groundwater quality in Policy 6-6

- iii. Recognize the productive capability of land in the water management sub-zone and
 - iv. Are achievable on most farms using best management practices and
 - v. Provide for appropriate timeframes for achievement where large changes to management practices or high levels of investment are required to achieve the nitrogen leaching maximums
- (ii) Existing *dairy intensive farming** *land*[^] use activities must be regulated in specified targeted Water Management Sub-zones* to achieve the nitrogen leaching maximums specified in (i) nutrient management planning, the exclusion of dairy cattle from some surface water bodies[^] and their beds[^] and the provision of dairy cattle crossings over some rivers[^].
- (ia) New *dairy intensive farming** *land*[^] use activities must be regulated throughout the Region ~~so as not to exceed~~ achieve the nitrogen leaching rates maximums specified in (i) based on the natural capital* of each LUC* class of land[^], and to achieve nutrient management planning, the exclusion of dairy cattle from some surface water bodies[^] and their beds[^] and the provision of dairy cattle crossings over some rivers[^].
- ~~(iii) For the purposes of (a)(i), specified Water Management Sub-zones* are those Sub-zones* listed in Table 13.1 where, collectively, dairy farming* land[^] use activities are significant contributors to elevated nutrient levels in groundwater or surface water[^].~~
- (b) **Faecal contamination**
- (iii) Those persons carrying out existing *dairy intensive farming** *land*[^] use activities in the targeted Water Management Sub-zones* listed in Table 13.1 or new conversions to dairy intensive farming* land use activities anywhere in the Region must be required, amongst other things, to
- (1) prevent dairy cattle access to some surface water bodies[^] and their beds[^]
 - (2) mitigate faecal contamination of surface water[^] from other entry points (eg., race run-off)
 - (3) establish programmes for implementing any required changes.
- (c) **Sediment**
- (i) In those *Water Management Sub-zones** where agricultural *land*[^] use activities are the predominant cause of elevated sediment levels in surface water[^], the Regional Council will promote the preparation of voluntary management plans under the Council's Sustainable Land Use Initiative or Whanganui Catchment Strategy for the purpose of reducing the risk of *accelerated erosion**, as described in Chapter 5.

(d) Nitrogen leaching transfer

- (i) Those persons that are carrying out existing or new *intensive farming* land* use activities in the targeted *Water Management Sub-zones** in accordance with (a)(ii) and (a)(ia) may comply with their nitrogen leaching maximums in whole or in part by securing some or all of the *cumulative nitrogen leaching maximum** of other land within the same *Water Management Sub-zone** that is not being used by an activity on that other land
- (ii) The *cumulative nitrogen leaching maximums** to be applied to the transferring land for the purpose of transferring nitrogen leaching rights must be established in the Regional Plan.

[Policy 6-8 to Policy 6-32 not shown]

6.5 Methods

The taking of surface water and groundwater, discharging contaminants to surface water and to land, and the undertaking of activities that disturb the beds of rivers or lakes, are largely regulated activities. Part II: Regional Plan contains rules relating to the activities described in this chapter. The key non-regulatory methods the Regional Council will pursue are outlined below.

[Methods 6-1 to 6-6 not shown]

Method 6-7		Water Quality Improvement	
Description	<p>The Regional Council and other agencies will work with landowners to protect and enhance the water quality of the Region's water bodies. Landowners in those <i>Water Management Sub-zones*</i> where the nutrient management (non-point source discharge) control rules are to be introduced will receive the highest priority for assistance. This method represents an expansion of the Regional Council's existing water quality improvement programme, which focuses almost entirely on dairy farmers as part of the Dairying and Clean Streams Regional Action Plan for Manawatu-Wanganui Region.</p> <p>Landowners will be provided with advice and financial/project management assistance to carry out enhancement and protection measures including fencing and planting of riparian margins. The Regional Council will seek funding from third parties to assist with this method.</p> <p>The effectiveness of the protection and enhancement works will be monitored.</p>		
Who	Regional Council, Dairy NZ, Fonterra, Horticulture NZ , Territorial Authorities and funding agencies including the He Tini Awa Trust and Nga Whenua Rahui.		
Links to Policy	This method implements Policies 6-2, 6-4 and 6-7.		

Method 6-7 Water Quality Improvement	
Targets	<ul style="list-style-type: none"> The targets of the Dairying and Clean Streams Regional Action Plan for Manawatu-Wanganui Region are achieved by the due dates. Advice and assistance is offered to all landowners affected by the nutrient management rules. All landowner requests for advice and assistance regarding water quality improvement are responded to promptly.

Method 6-8 Education in Schools - Water	
Description	The aim of this method is to raise awareness amongst the youth of the Region of the significance of the water (quantity and quality) resource, the threats to it, and what they can do to protect/restore it. This will be achieved through various environmental education programmes/initiatives - for example, Green RIG, Enviroschools and Trees for Survival.
Who	Regional Council, various national and local environmental education providers and the Youth Environment Forum.
Links to Policy	This method implements Policy 6-2.
Targets	The Regional Council develops and delivers a water-related environmental education programme.

Method 6-6A Lake Horowhenua and Other Coastal Lakes	
Description	<p>The Regional Council and other agencies will work with all agencies to protect and enhance Lake Horowhenua and other coastal lakes.</p> <p>Landowners and other agencies will be provided with advice and project management assistance to carry out enhancement and protection measures including fencing, planting, sediment control, wastewater/stormwater management and fertiliser application management. The Regional Council will seek funding from third parties to assist with this method.</p> <p>The effectiveness of the protection and enhancement works in achieving improved water quality within Lake Horowhenua and other Coastal Lakes will be monitored.</p> <p>The method will include publicity to increase public awareness about the importance of the lakes. The method will include utilising industry codes of practice as a means of enhancing and protecting water quality e.g. the Code of Practice for Commercial Vegetable Growing in the Horizons Region.</p>
Who	Regional Council, Territorial Authorities, Fish and Game, Department of Conservation, iwi, Horticulture NZ, landowners and other agencies.
Links to Policy	This method implements Policy 6-X
Target	The Lake is actively managed, including protection and enhancement measures, within 5 years of this Plan becoming operative.

Method 6-6B Lake Quality Research, Monitoring and Reporting	
Description	The aim of this method is to develop an integrated research,

Method 6-6B Lake Quality Research, Monitoring and Reporting	
	monitoring and reporting programme. The focus will be to define the current state of the quality of the Region's lakes particularly the Region's coastal lakes. The method will seek to assess the state and quality of the lakes to better understand the influences on water quality in those lakes. The outcomes will link into work to refine existing policies, objectives and methods in terms of the need to add rural land uses and water management sub-zones in managing nutrient management and effects on water quality. The outcomes will also guide implementation planning and allow implementation effectiveness is to be assessed.
Who	Regional Council, Department of Conservation, Fish and Game, Horticulture New Zealand, DairyLink, research institutes, universities, non-Government agencies, community groups and iwi authorities as required.
Links to Policy	This method implements Policies 6-3, 6-4, 6-5, 6-7, 6-7A and 6-7B.
Targets	A research, monitoring and reporting programme that defines the current state of water quality of the Region's lakes (particularly coastal lakes) and measure changes in water quality.

Method 6-9 Water (Fluvial Resources, Quality and Quantity) Research, Monitoring and Reporting	
Description	The aim of this method is to develop an integrated research, monitoring and reporting programme. The focus will be to define the current state of the natural character of the Region's rivers by analysing their habitat and morphological diversity. This may include: planform/ channel morphology classification; fairway width; sinuosity; barforms; percentage of pool, riffle, run, habitat; gravel resources, level of entrenchment, and location and extent of riparian and wetland areas. The method will also seek to measure changes in natural character, including habitat and morphological diversity. The outcomes will link into monitoring undertaken by the River Works Environmental Code of Practice and support delivery and refinement of existing policies, objectives and methods. The outcomes will also guide implementation planning and allow implementation effectiveness to be assessed.
Who	Regional Council, Department of Conservation, Fish and Game, research institutes, universities, non-Government agencies, community groups and iwi authorities as required.
Links to Policy	This method implements Policies 6-2, 6-15, 6-17, 6-27, 6-28, 6-29, 6-30, 6-31 and 7-8.
Targets	A research, monitoring and reporting programme that defines the current state of the natural character of the Region's rivers and measure changes in natural character, including habitat and morphological diversity.

6.6 Anticipated Environmental Results

Anticipated Environmental Result	Link to Policy	Indicator	Data Source
During the life of this Plan, water quality and quantity maintain the Values set in this Plan.	Water Policies: 6-1, 6-2, 6-3, 6-4, 6-5, 6-7, 6-8, 6-9,	<ul style="list-style-type: none"> Measured water quality compared to <i>Water Management Sub-zone*</i> 	<ul style="list-style-type: none"> The Regional Council's State of Environment

Anticipated Environmental Result	Link to Policy	Indicator	Data Source
<p>In <i>Water Management Sub-zones*</i>:</p> <ul style="list-style-type: none"> where water quality targets are met prior to this Plan becoming operative, they continue to be met where water quality targets are not met prior to this Plan becoming operative, they are either met or improved from the current state where targeted for action or, where not targeted for action, they are no worse than prior to this Plan becoming operative. 	<p>6-11, 6-12, 6-13, 6-15, 6-16, 6-18, 6-20, 6-27, 6-28, 6-29, 6-30 and 6-31</p> <p>Land Policies: 5-1, 5-2A and 5-5</p> <p>Living Heritage Policies: 7-1, 7-2A, 7-4, 7-5 and 7-8</p>	<p>targets, especially measures for “muddy waterways”, “safe swimming”, “safe food gathering”, and “aquatic ecosystem health” in priority catchments</p> <ul style="list-style-type: none"> Incidents where surface water quality is confirmed as unfit for use Measured flows of surface water compared to the allocation and minimum flow regime outlined in this Plan 	<p>water quality and quantity monitoring programme</p> <ul style="list-style-type: none"> The Regional Council’s incidents database Ministry of Health raw water monitoring
<p>By 2017, the natural, physical and cultural qualities of the beds of rivers are suitable for specified <i>Water Management Sub-zone*</i> Values.</p>	<p>Water Policies: 6-1, 6-27, 6-28, 6-29, 6-30 and 6-31</p>	<ul style="list-style-type: none"> Confirmed incidents of damage to the beds of rivers Consents granted for activities in beds of rivers and lakes 	<ul style="list-style-type: none"> The Regional Council’s incidents database The Regional Council’s consents database
<p>The amount of groundwater used does not exceed replenishment rates and its quality is the same as or better than that measured prior to this Plan becoming operative, other than where discharges to land are a permitted activity or are allowed by resource consent.</p>	<p>Water Policies: 6-6, 6-9, 6-12, 6-13, 6-21 and 6-23</p>	<ul style="list-style-type: none"> Groundwater levels Region-wide, but with a focus on Opiki and Himatangi areas Groundwater quality Region-wide, but with a focus on nitrates in Horowhenua and Tararua districts and conductivity along the Foxton-Tangimoana coast Confirmed incidents where groundwater sources become unavailable (ie., dry up) or water quality is unfit for use 	<ul style="list-style-type: none"> The Regional Council’s State of Environment groundwater monitoring programme The Regional Council’s compliance monitoring programme The Regional Council’s incidents database Ministry of Health raw water monitoring

6.7 Explanations and Principal Reasons

The Region has been divided into *Water Management Sub-zones** for the purpose of managing water quality and quantity. Water bodies and their beds within these *Water Management Sub-zones** have been assigned Values which represent the ecosystem, recreational, cultural and social and economic attributes of the water body and its bed (Objective 6-1, Policy 6-1). Targets have been assigned to protect these Values (Policies 6-2 to 6-5).

Discharges to water and land

The water chapter deals with discharges to land and water holistically. This is because discharges to land have the potential to adversely affect groundwater and surface water quality if not managed well. Three types

of discharges of concern have been identified: point source discharges to land (including *domestic wastewater**), point source discharges to water (including industrial discharges and treated sewage) and non-point source discharges to land (from agricultural land uses). All these types of discharges will be managed to meet the objectives and policies for water quality (Objective 6-1, 6-2, Policies 6-2 - 6-5), including discharges to land (Policy 6-9).

Agricultural land uses contribute to water bodies not meeting the Region's targets for nutrients, faecal contamination and sediment levels. These need to be targeted for control in problem catchments and through the Regional Council's Sustainable Land Use Initiative (SLUI) and Whanganui Catchment Strategy and the regulation of *dairy farming** (Policy 6-7). Control will centre around using best practice management techniques and requiring *nutrient management plans**.

Point source discharges to water need to be managed to achieve water quality targets (Policy 6-8). This may mean that it is appropriate to consider alternatives to discharging to water. This may include considering alternative treatment options for all or part of the year, to achieve or move closer to water quality targets at critical times of the year. In all cases, point source discharges to water of untreated human sewage are culturally unacceptable, and direct discharges of treated human sewage should be changed to involve land application before discharge (Policy 6-11).

Surface Water Quantity

Water will be used and allocated in a way which enables water to be used for the wellbeing of people and the community, while providing for other Values (Objective 6-3, Policy 6-15). Water allocation limits are set for each *Water Management Sub-zone** and water will be managed to maintain these limits (Policies 6-16 and 6-17). When water use needs to be restricted, life sustaining and essential water takes have first priority (Policy 6-19). Water harvesting and alternative sources of water to surface water are also encouraged and provided for (Policy 6-18). Efficiency of use is an important consideration, and will ensure that water is available to the maximum number of users and is not wasted (Policies 6-12 and 6-13).

Groundwater

Groundwater quality and quantity is connected to that of surface water and this is recognised in this chapter, while providing for its management separately. *Bores** will be managed to ensure that they are properly constructed, efficient and fully functioning and do not lead to contamination of groundwater, wastage of water or unnecessary effects on other *bores** or surface water bodies (Policy 6-21). *Groundwater Management Zones** have been established and sustainable allocations set; groundwater takes will be managed within these allocations (Policy 6-23). Groundwater quality within the Region is generally good and is not declining, but maintaining this good quality will be a consideration when managing discharges (Policy 6-9).

Beds of Rivers and Lakes

The physical nature of the Region's rivers and lakes and their beds is important to maintaining the Values assigned to them. Management of activities in the beds of rivers and lakes will be undertaken in order to

maintain these Values, and other important physical attributes (Objective 6-4, Policies 6-27 and 6-31). Some Values are treated differently. Important aquatic biodiversity *sites**, cultural *sites** and natural state areas would be negatively and potentially permanently harmed by some activities and consequently are given a high level of protection (Policy 6-28). Flood control and drainage schemes have damaged water Values in some areas, but also provide valuable protection services to the community. Maintaining this level of service is important, while ensuring that other Values are not further compromised (Policy 6-29). While recognising the Values, acknowledgement is also needed that some activities, such as river restoration, are beneficial and should be allowed to occur (Policy 6-31).

Gravel extraction is an important activity in river beds, both for the benefit the gravel resource provides and the flood protection benefit of having it removed from the river. However, if not well managed, too much extraction or extraction in an inappropriate manner can damage river Values. Gravel extraction needs to be managed to ensure that extraction volumes are sustainable (Policy 6-32).

13. Discharges to Land and Water

13.1A Objectives

Objective 13-1: ~~Regulation~~ Management of discharges[^] to land[^] and water[^] and land uses affecting groundwater and surface water quality

The ~~regulation~~ management of discharges[^] onto or into land[^] (including those that enter water[^]) or directly into water[^] and land[^] use activities affecting groundwater and surface water[^] quality in a manner that:

- (a) Safeguards the life supporting capacity of water and advances the achievement of ~~has regard to~~ the Values and management objectives in Schedule AB,
- (b) ~~has regard to~~ provides for the objectives and policies of Chapter 6 as they relate to surface water[^] and groundwater quality, and
- (c) where a discharge[^] is onto or into land[^], avoids, remedies or mitigates adverse effects[^] on surface water[^] or groundwater.

13.1 Policies

[Policy 13-1 to 13-2B not shown]

Policy 13-2C: Management of ~~dairy~~ intensive farming* land[^] uses

In order to give effect to Policy 6-X and Policy 6-7, land use activities affecting groundwater and surface water quality must be managed in the following manner:

- (a) The following land uses have been identified as intensive farming land uses:
 - (i) Dairy farming*

- (b) The intensive farming land uses identified in (a) must be regulated where:
 - (i) They are existing (established prior to this plan becoming operative) land uses, in the targeted water management sub-zones identified in Table 13.1
 - (ii) They are new (established after this plan becomes operative) land uses, in all water management sub-zones in the Region
- (c) Nitrogen leaching maximums have been established in Table 13.2.
- (d) Existing intensive farming land uses regulated in accordance with (b)(i) must be managed to ensure that the leaching of nitrogen from those land uses does not exceed the nitrogen leaching maximums values for each year contained in Table 13.2, unless the circumstances in Policy 13-2D apply.
- (e) New intensive farming land uses regulated in accordance with (b)(ii) must be managed to ensure that the leaching of nitrogen from those land uses does not exceed the nitrogen leaching maximums values for year 20 contained in Table 13.2, unless the circumstances in Policy 13-2D apply.
- (f) Intensive farming land uses regulated in accordance with (b) must exclude cattle from:
 - (i) A wetland or lake that is rare habitat or threatened habitat or at risk habitat
 - (ii) Any river that is permanently flowing, or is intermittently flowing and has an active bed width greater than 1 metre (when measured as an average across the property) at any time the bed contains water, unless the access is required for cattle to cross the river, in which case;
- (g) All places where cattle cross the river to result in more than 1350 cattle movements per week must be culverted or bridged and those culverts or bridges must be used by the cattle whenever they cross that river.

Policy 13-2D: Resource consent decision making for intensive farming* land^ uses

When making decisions on *resource consent*[^] applications, and setting consent *conditions*[^], for *dairy farming*^{*} as a *land*[^] use, the Regional Council must:

- (a) ~~have regard to Policy 6-7,~~
- (b) ensure that nitrogen leaching from the *land*[^] is managed in accordance Policy 13-2C.
- (c) An exception may be made to (b) minimised as far as reasonably practicable for existing *land*[^] uses in the following circumstances:

- (i) where the existing intensive farming activity occurs on land that has 50% or higher of LUC Classes IV to VIII and has an average annual rainfall of 1500mm or greater.
- (ii) where existing intensive farming land uses cannot meet year 1 nitrogen leaching maximums in year 1, they shall be managed through conditions on their resource consent to ensure year 1 nitrogen leaching maximums are met within 4 years
- (ca) An exception may be made to (b) where new or existing intensive farming land uses can achieve their *cumulative nitrogen leaching maximum** by way of a nitrogen leaching transfer in accordance with Policy 13-2E.
- (d) Where an exception is made to the nitrogen leaching maximum under (c)(ii) those intensive farming land uses must be managed by consent conditions to ensure:
 - (i) That the nitrogen leaching from the activity does not exceed the nitrogen leaching demonstrated for the property from 1 July 2010 to 31 June 2011.
 - (ii) All reasonably practicable best management practices to minimise the loss of nitrogen, phosphorous, faecal contamination and sediment are implemented
 - (iii) Any losses of nitrogen, which cannot be minimised under (d)(ii) are remedied or mitigated, including by other works or environmental compensation. Mitigation works may include (but are not limited to) creation of wetland and riparian planted zones
- (e) Where an exception is made to the year 1 nitrogen leaching maximum* under (c)(ii) those intensive farming land uses must be managed by consent conditions to ensure:
 - (i) The nitrogen leaching maximum for year 1 shall be no greater than the actual demonstrated nitrogen leaching loss for the year from 1 July 2010 to 31 June 2011.
 - (ii) In year two there must be a 33% reduction in the difference between the loss limit set under Table 13.1 and the nitrogen leaching maximum * set out in Table 13.2 or a reduction of 2kg/N/ha whichever is the greater.
 - (iii) In year three there must be a further 33% reduction in the difference between the loss limit set under Table 13.1 and the nitrogen leaching maximum * set out in Table 13.2 or a reduction of 2kg/N/ha whichever is the greater.
 - (iv) In year four the Table 13.2 nitrogen leaching rate must be achieved.
- (f) ~~ensure that nitrogen leaching from new *dairy farming* land*[^] uses does not exceed nitrogen leaching rates based on the *natural capital** of each *LUC** class of *land*[^] used for *dairy farming**, and~~
- (g) ~~ensure that *dairy* cattle are excluded from surface *water*[^] as far as reasonably practicable in accordance with Policy 13-2C(f) and~~
(g)

- (h) an exception may be made to (g) in circumstances where landscape or geographical constraints make stock exclusion impracticable, in which case any unavoided losses of nitrogen, phosphorus, faecal contamination and sediment are remedied or mitigated by other works or environmental compensation. Mitigation works may include (but are not limited to) creation of wetland and riparian planted zones.

Policy 13-2E: Nitrogen leaching transfers

When making decisions on *resource consent*[^] applications, and setting consent *conditions*[^], for *land*[^] use activities that involve nitrogen leaching, the Regional Council may provide for the transfer of nitrogen leaching rights between two or more land use activities within the same *Water Management Sub-zone*^{*}. The Regional Council must manage all of the land use activities involved in the nitrogen loss transfer by resource consent conditions to ensure:

- (i) Policy 13-2D (g) and (h) are met
- (ii) The total combined nitrogen leaching from all land use activities involved in the nitrogen leaching transfer must be no greater than the total combined *cumulative nitrogen leaching maximums*^{*} applicable to all of the land use activities involved in the nitrogen leaching transfer.
- (iii) For new *intensive farming activities*^{*} and land use activities that are not *intensive farming activities*^{*} that are transferring the right to use a portion of their *cumulative nitrogen leaching maximum*^{*} to another land use activity, the Year 20 *cumulative nitrogen leaching maximum*^{*} in Table 13.2 applies to those activities.
- (iv) For existing intensive farming activities that are transferring the right to use a portion of their *cumulative nitrogen leaching maximum*^{*}, the *cumulative nitrogen leaching maximum*^{*} that would otherwise apply (as set out in Table 13.2) applies to those activities.
- (v) The term of the transfer must be recorded, and the term must be no longer than the term of the shortest term consent to which the transfer is associated.
- (vi) The details of the transfer must be recorded on each resource consent, and must include the date the transfer commences and expires, the amount of nitrogen transferred and the names of the consent holders involved in the transfer.
- (vii) The nitrogen leaching being transferred is not being relied on by another land use activity to achieve its *cumulative nitrogen leaching maximum*^{*}

Policy 13-3 and 13-4 not shown

13.2 Rules - Agricultural Activities

Table 13.1 sets out the target *Water Management Sub-zones** where management of existing *dairy intensive farming** land[^] use activities must be specifically controlled.

Table 13.1 *Targeted Water Management Sub-zones**

Catchment	Water Management Sub-zone*	Date Rule 13-1 comes into force
Mangapapa	Mangapapa Mana_9b	1 July 2012
Mangatainoka	Upper Mangatainoka Mana_8a Middle Mangatainoka Mana_8b Lower Mangatainoka Mana_8c Makakahi Mana_8d	1 July 2012
Upper Manawatu above Hopelands	Upper Manawatu Mana_1a Mangatewainui Mana_1b Mangatoro Mana_1c Weber-Tamaki Mana_2a Mangatera Mana_2b Upper Tamaki Mana_3 Upper Kumeti Mana_4 Tamaki-Hopelands Mana_5a Lower Tamaki Mana_5b Lower Kumeti Mana_5c Oruakeretaki Mana_5d Raparapawai Mana_5e	1 July 2012
Lake Horowhenua	Lake Horowhenua Hoki_1a Hokio Hoki_1b	1 July 2012
Waikawa	Waikawa West_9a Waikawa West_9b	1 July 2012
Manawatu above gorge	Hopelands-Tiraumea Mana_6 Upper Gorge Mana_9a Mangaatua Mana_9c	1 July 2012
Other south-west catchments (Waitarere and Papaitonga)	Lake Papaitonga West_8 Waitarere West_7	1 July 2013

Catchment	Water Management Sub-zone*	Date Rule 13-1 comes into force
Coastal Rangitikei	Coastal Rangitikei Rang_4	1 July 2014
Other coastal lakes	Northern Manawatu Lakes West_6 Kaitoke Lakes West_4 Southern Wanganui Lakes West_5[2]	1 July 2014

Table 13.2 sets out the *cumulative nitrogen leaching maximum** for the *land^* used for ~~dairy~~ *intensive farming** within each specified *land use capability class**.

Table 13.2 Cumulative nitrogen leaching maximum* by Land Use Capability Class*

Period (from year that rule becomes operative)	LUC* I	LUC* II	LUC* III	LUC* IV	LUC* V	LUC* VI	LUC* VII	LUC* VIII
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
Year 20	25	21	18	13	12	10	6	2

Rule	Activity	Classification	Conditions/Standards/Terms	Control/Discretion Non-Notification
13-1 Existing dairy intensive farming* <i>land^</i> use activities	The use of <i>land^</i> pursuant to s9(2) RMA for any of the following types of dairy intensive farming* <i>intensive farming*</i> : (a) dairy farming* <i>dairy farming*</i> (b) commerical vegetable growing* <i>commerical vegetable growing*</i> (c) cropping* <i>cropping*</i> (d) intensive sheep and beef farming* <i>intensive sheep and beef farming*</i> that was existing as at 1 July 2010 in the	Controlled	(a) A <i>nutrient management plan*</i> must be prepared for the <i>land^</i> , complied with and provided annually to the Regional Council. (aa) The activity must be undertaken in accordance with the nutrient management plan prepared under (a). (ab) The nutrient management plan prepared under (a) must demonstrate that the nitrogen leaching loss (accounting for any transferred nitrogen leaching loss) from the activity will not exceed the nitrogen leaching maximum specified in Table 13.2. (b) Dairy Cattle must be excluded from:	Control is reserved over: (a) the implementation of the nutrient management plan. reasonably practicable farm management practices for minimising nutrient leaching, faecal contamination and sediment losses from the land^ (aa) compliance with the nitrogen leaching maximums specified in Table 13.2 (b) the matters of control in Rule 13-6

Rule	Activity	Classification	Conditions/Standards/Terms	Control/Discretion Non-Notification
	<p><i>Water Management Sub-zones</i>[*] listed in Table 13.1 and any of the following <i>discharges</i>[^] pursuant to ss15(1) or 15(2A) RMA associated with <u>that intensive dairy farming</u>[*]:</p> <p>(e) the <i>discharge</i>[^] of <i>fertiliser</i>[*] onto or into <i>land</i>[^]</p> <p>(f) the <i>discharge</i>[^] of <i>contaminants</i>[^] onto or into <i>land</i>[^] from</p> <p>(i) the preparation, storage, use or transportation of stock feed on <i>production land</i>[^]</p> <p>(ii) the use of a <i>feedpad</i>[*]</p> <p>(g) the <i>discharge</i>[^] of grade Aa, Ab, Ba or Bb <i>biosolids</i>[^], <i>soil conditioners</i>[*] or <i>compost</i>[*] onto or into <i>production land</i>[^]</p> <p>(h) the <i>discharge</i>[^] of <i>poultry farm litter</i>[*] onto or into <i>production land</i>[^]</p> <p>(i) the <i>discharge</i>[^] of <i>farm animal effluent</i>[*] onto or into <i>production land</i>[^] (or upon expiry or surrender of any existing consent for that <i>discharge</i>[^]) including:</p> <p>(i) effluent from dairy sheds and <i>feedpads</i>[*]</p> <p>(ii) effluent received from piggeries</p> <p>(iii) sludge from farm effluent ponds</p> <p>(iv) poultry farm effluent</p> <p>and any ancillary <i>discharge</i>[^] of <i>contaminants</i>[^] into air pursuant to ss15(1) or 15(2A) RMA.</p>		<p>(i) <i>wetlands</i>[^] and <i>lakes</i>[^] that are a <i>rare habitat</i>[*] or <i>threatened habitat</i>[*], and</p> <p>(ii) <i>the beds</i>[^] of <i>rivers</i>[^] that are permanently flowing or have an <i>active bed</i>[*] width greater than 1 m, other than at any specific location where access is required for dairy cattle to cross the <i>river</i>[^] in which case (c) applies.</p> <p>(c) <i>Rivers</i>[^] that are permanently flowing or have an <i>active bed</i>[*] width greater than 1 m, that are crossed by more than 1350 dairy cattle movements per week, must be bridged or culverted, and the <u>cattle must cross via that bridge or culvert</u>, and run-off originating from the carriageway of the bridge or culvert must be <i>discharged</i>[^] onto or into <i>land</i>[^].</p> <p>(d) The <i>discharge</i>[^] of <i>fertiliser</i>[*] onto or into <i>land</i>[^] and any ancillary <i>discharge</i>[^] of <i>contaminants</i>[^] into air must comply with the <i>conditions</i>[^] of Rule 13-2.</p> <p>(e) The <i>discharge</i>[^] of <i>contaminants</i>[^] onto or into <i>land</i>[^] from:</p> <p>(i) the preparation, storage, use or transportation of stock feed on <i>production land</i>[^], or</p> <p>(ii) the use of a <i>feedpad</i>[*]</p> <p>and any ancillary <i>discharge</i>[^] of <i>contaminants</i>[^] into air must comply with the <i>conditions</i>[^] of Rule 13-3.</p> <p>(f) The <i>discharge</i>[^] of grade Aa <i>biosolids</i>[*], <i>soil conditioners</i>[*] or <i>compost</i>[*] onto or into <i>production land</i>[^] and any ancillary <i>discharge</i>[^] of <i>contaminants</i>[^] into air must comply with the <i>conditions</i>[^] of Rule 13-4.</p> <p>(g) The <i>discharge</i>[^] of grade Ab, Ba or Bb <i>biosolids</i>[*] onto or into <i>production land</i>[^] and any ancillary <i>discharge</i>[^] of <i>contaminants</i>[^] into air must comply with the <i>conditions</i>[^] of Rule 13-4A.</p>	<p>(c) avoiding, remedying or mitigating the effects of odour, dust, <i>fertiliser</i>[*] drift or effluent drift</p> <p>(d) provision of information including the <i>nutrient management plan</i>[*]</p> <p>(e) duration of consent</p> <p>(f) review of consent <i>conditions</i>[^]</p> <p>(g) compliance monitoring.</p> <p>(h) <u>Transferring of nitrogen leaching to or from another property</u></p> <p><i>Resource consent</i>[^] applications under this <i>rule</i>[^] will not be notified and written approval of affected persons will not be required (notice of applications need not be <i>served</i>[^] on affected persons).</p>

Rule	Activity	Classification	Conditions/Standards/Terms	Control/Discretion Non-Notification
	<p><u>Where the existing intensive farming land use is located partly on land within one or more of the water management sub-zones listed in Table 13.1 and partly on other land, this rule only applies if at least 20% of the intensive farming land use is located on land within the listed water management sub-zones.</u></p>		<p>(h) The <i>discharge</i>[^] of <i>poultry farm litter</i>[*] onto or into <i>production land</i>[^] and any ancillary <i>discharge</i>[^] of <i>contaminants</i>[^] into air must comply with the <i>conditions</i>[^] of Rule 13-4B.</p> <p>(i) The <i>discharge</i>[^] of farm <i>animal effluent</i>^{**} onto or into <i>production land</i>[^] including:</p> <ul style="list-style-type: none"> (i) effluent from dairy sheds and <i>feedpads</i>[*] (ii) effluent received from piggeries (iii) sludge from farm effluent ponds (iv) poultry farm effluent <p>and any ancillary <i>discharge</i>[^] of <i>contaminants</i>[^] into air must comply with the <i>conditions</i>[^], standards and terms of Rule 13-6.</p>	
<p>13-1A Existing <i>dairy intensive farming</i>[*] land[^] use activities not complying with Rule 13-1</p>	<p>The use of <i>land</i>[^] pursuant to s9(2) RMA for <u>any of the following types of <i>dairy intensive farming</i>[*]:</u></p> <ul style="list-style-type: none"> (j) <u><i>dairy farming</i>[*]</u> (k) <u><i>commerical vegetable growing</i>[*]</u> (l) <u><i>cropping</i>[*]</u> (m) <u><i>intensive sheep and beef farming</i>[*]</u> <p>that was existing as at 1 July 2010 in the <i>Water Management Sub-zones</i>[*] listed in Table 13.1, and any of the following <i>discharges</i>[^] pursuant to ss15(1) or 15(2A) RMA associated with <i>dairy intensive farming</i>[*], that do not comply with one or more of the <i>conditions</i>[^], standards and terms of Rule 13-1:</p> <ul style="list-style-type: none"> (a) the <i>discharge</i>[^] of <i>fertiliser</i>[*] onto or into <i>land</i>[^] 	<p>Restricted Discretionary</p>		<p>Discretion is restricted to:</p> <ul style="list-style-type: none"> (a) preparation of, and compliance with a <i>nutrient management plan</i>[*] for the <i>land</i>[^] <ul style="list-style-type: none"> (aa) <u>compliance with the nitrogen leaching maximums specified in Table 13.2</u> (b) <u>the implementation of reasonably practicable farm management practices for minimising measures to avoid, remedy or mitigate nutrient leaching, faecal contamination and sediment losses from the <i>land</i>[^]</u> (c) measures to exclude dairy cattle from <i>wetlands</i>[^] and <i>lakes</i>[^] that are a <i>rare habitat</i>[*] or <i>threatened habitat</i>[*], and <i>rivers</i>[^] that are permanently flowing or have an <i>active bed</i>[*] width greater than 1 m

Rule	Activity	Classification	Conditions/Standards/Terms	Control/Discretion Non-Notification
	<p>(b) the <i>discharge</i>[^] of <i>contaminants</i>[^] onto or into <i>land</i>[^] from</p> <p>(i) the preparation, storage, use or transportation of stock feed on <i>production land</i>[^]</p> <p>(ii) the use of a <i>feedpad</i>[*]</p> <p>(c) the <i>discharge</i>[^] of grade Aa, Ab, Ba or Bb <i>biosolids</i>[^], <i>soil conditioners</i>[*] or <i>compost</i>[*] onto or into <i>production land</i>[^]</p> <p>(d) the <i>discharge</i>[^] of <i>poultry farm litter</i>[*] onto or into <i>production land</i>[^]</p> <p>(e) the <i>discharge</i>[^] of <i>farm animal effluent</i>[*] onto or into <i>production land</i>[^] (or upon expiry or surrender of any existing consent for that <i>discharge</i>[^]) including:</p> <p>(i) effluent from dairy sheds and <i>feedpads</i>[*]</p> <p>(ii) effluent received from piggeries</p> <p>(iii) sludge from farm effluent ponds</p> <p>(iv) poultry farm effluent</p> <p>and any ancillary <i>discharge</i>[^] of <i>contaminants</i>[^] into air pursuant to ss15(1) or 15(2A) RMA.</p>			<p>(d) the bridging or culverting of <i>rivers</i>[^] that are permanently flowing or have an <i>active bed</i>[*] width greater than 1 m that are crossed by dairy cattle</p> <p>(e) the matters referred to in the <i>conditions</i>[^] of Rules 13-2, 13-3, 13-4, 13-4A and 13-4B</p> <p>(f) the matters referred to in the <i>conditions</i>[^] of Rule 13-6 and the matters of control in Rule 13-6</p> <p>(g) avoiding, remedying or mitigating the effects of odour, dust, <i>fertiliser</i>[*] drift or effluent drift</p> <p>(h) provision of information including the annual <i>nutrient management plan</i>[*]</p> <p>(i) duration of consent</p> <p>(j) review of consent <i>conditions</i>[^]</p> <p>(k) compliance monitoring.</p>
<p>13-1B New <i>dairy intensive farming</i>[*] <i>land</i>[^] use activities</p>	<p>The use of <i>land</i>[^] pursuant to s9(2) RMA for any conversion to <u>any of the following types of <i>dairy intensive farming</i>[*]</u>:</p> <p>(n) <u><i>dairy farming</i>[*]</u></p> <p>(o) <u><i>commerical vegetable growing</i>[*]</u></p> <p>(p) <u><i>cropping</i>[*]</u></p>	<p>Controlled</p>	<p>(a) A <i>nutrient management plan</i>[*] must be prepared for the <i>land</i>[^], complied with and provided annually to the Regional Council.</p> <p>(aa) The activity must be undertaken in accordance with the nutrient management plan prepared under (a)</p> <p>(ab) The nutrient management plan prepared under (a) must demonstrate that the nitrogen leaching loss</p>	<p>Control is reserved over:</p> <p>(c) the implementation of the <u><i>nutrient management plan</i></u>. farm management practices to maintain compliance with the <i>cumulative nitrogen leaching maximum</i>[*] for the <i>land</i>[^]</p>

Rule	Activity	Classification	Conditions/Standards/Terms	Control/Discretion Non-Notification
	<p>(q) <u>intensive sheep and beef farming*</u> that occurs after 1 July 2010 anywhere within the Region and any of the following <i>discharges</i>[^] pursuant to ss15(1) or 15(2A) RMA associated with <i>dairy intensive farming</i>[*]:</p> <p>(a) the <i>discharge</i>[^] of <i>fertiliser</i>[*] onto or into <i>land</i>[^]</p> <p>(b) the <i>discharge</i>[^] of <i>contaminants</i>[^] onto or into <i>land</i>[^] from</p> <p>(i) the preparation, storage, use or transportation of stock feed on <i>production land</i>[^]</p> <p>(ii) the use of a <i>feedpad</i>[*]</p> <p>(c) the <i>discharge</i>[^] of grade Aa, Ab, Ba or Bb <i>biosolids</i>[^], <i>soil conditioners</i>[*] or <i>compost</i>[*] onto or into <i>production land</i>[^]</p> <p>(d) the <i>discharge</i>[^] of <i>poultry farm litter</i>[*] onto or into <i>production land</i>[^]</p> <p>(e) the <i>discharge</i>[^] of <i>farm animal effluent</i>[*] onto or into <i>production land</i>[^] including:</p> <p>(i) effluent from dairy sheds and <i>feedpads</i>[*]</p> <p>(ii) effluent received from piggeries</p> <p>(iii) sludge from farm effluent ponds</p> <p>(iv) poultry farm effluent</p> <p>and any ancillary <i>discharge</i>[^] of <i>contaminants</i>[^] into air pursuant to ss15(1) or 15(2A) RMA.</p>		<p><u>(accounting for any transferred nitrogen leaching loss)</u> from the activity will not exceed the nitrogen leaching maximum for Year 20 as specified in Table 13.2.</p> <p>(b) <i>Dairy Cattle</i> must be excluded from:</p> <p>(iii) <i>wetlands</i>[^] and <i>lakes</i>[^] that are a <i>rare habitat</i>[*] or <i>threatened habitat</i>[*], and</p> <p>(iv) <i>the beds</i>[^] of <i>rivers</i>[^] that are permanently flowing or have an <i>active bed</i>[*] width greater than 1 m, other than at any specific location where access is required for <i>dairy cattle</i> to cross the <i>river</i>[^] in which case (c) applies.</p> <p>(c) <i>Rivers</i>[^] that are permanently flowing or have an <i>active bed</i>[*] width greater than 1 m, that are crossed by more than 1350 dairy cattle movements per week, must be bridged or culverted, <u>and the cattle must cross via that bridge or culvert</u>, and run-off originating from the carriageway of the bridge or culvert must be <i>discharged</i>[^] onto or into <i>land</i>[^].</p> <p>(e) The <i>discharge</i>[^] of <i>fertiliser</i>[*] onto or into <i>land</i>[^] and any ancillary <i>discharge</i>[^] of <i>contaminants</i>[^] into air must comply with the <i>conditions</i>[^] of Rule 13-2.</p> <p>(f) The <i>discharge</i>[^] of <i>contaminants</i>[^] onto or into <i>land</i>[^] from:</p> <p>(i) the preparation, storage, use or transportation of stock feed on <i>production land</i>[^], or</p> <p>(ii) the use of a <i>feedpad</i>[*]</p> <p>and any ancillary <i>discharge</i>[^] of <i>contaminants</i>[^] into air must comply with the <i>conditions</i>[^] of Rule 13-3.</p> <p>(g) The <i>discharge</i>[^] of grade Aa <i>biosolids</i>[*], <i>soil conditioners</i>[*] or <i>compost</i>[*] onto or into <i>production land</i>[^] and any ancillary <i>discharge</i>[^] of <i>contaminants</i>[^] into air must comply with the <i>conditions</i>[^] of Rule 13-4.</p>	<p>aa) <u>compliance with the nitrogen leaching maximums specified in Table 13.2</u></p> <p>(d) the implementation of reasonably practicable farm management practices for minimising nutrient leaching, faecal contamination and sediment losses from the land[^]</p> <p>(e) the matters of control in Rule 13-6</p> <p>(f) avoiding, remedying or mitigating the effects of odour, dust, <i>fertiliser</i>[*] drift or effluent drift</p> <p>(g) provision of information including the <i>nutrient management plan</i>[*]</p> <p>(h) duration of consent</p> <p>(i) review of consent <i>conditions</i>[^]</p> <p>(j) compliance monitoring.</p> <p><u>(k) Transferring of nitrogen leaching to or from another property</u></p> <p><i>Resource consent</i>[^] applications under this <i>rule</i>[^] will not be notified and written approval of affected persons will not be required (notice of applications need not be <i>served</i>[^] on affected persons).</p>

Rule	Activity	Classification	Conditions/Standards/Terms	Control/Discretion Non-Notification
			<p>(h) The <i>discharge</i>[^] of grade Ab, Ba or Bb <i>biosolids</i>[*] onto or into <i>production land</i>[^] and any ancillary <i>discharge</i>[^] of <i>contaminants</i>[^] into air must comply with the <i>conditions</i>[^] of Rule 13-4A.</p> <p>(i) The <i>discharge</i>[^] of <i>poultry farm litter</i>[*] onto or into <i>production land</i>[^] and any ancillary <i>discharge</i>[^] of <i>contaminants</i>[^] into air must comply with the <i>conditions</i>[^] of Rule 13-4B.</p> <p>(j) The <i>discharge</i>[^] of farm <i>animal effluent</i>[*] onto or into <i>production land</i>[^] including:</p> <ul style="list-style-type: none"> (i) effluent from dairy sheds and <i>feedpads</i>[*] (ii) effluent received from piggeries (iii) sludge from farm effluent ponds (iv) poultry farm effluent <p>and any ancillary <i>discharge</i>[^] of <i>contaminants</i>[^] into air must comply with the <i>conditions</i>[^], standards and terms of Rule 13-6.</p>	
<p>13-1C New <i>dairy farming</i>[*] <i>land</i>[^] use activities not complying with Rule 13-1B</p>	<p>The use of <i>land</i>[^] pursuant to s9(2) RMA for <u>any of the following types of <i>dairy intensive farming</i>[*]</u>:</p> <ul style="list-style-type: none"> (r) <u><i>dairy farming</i>[*]</u> (s) <u>commerical vegetable growing</u>[*] (t) <u>cropping</u>[*] (u) <u>intensive sheep and beef farming</u>[*] <p>that occurs after 1 July 2010 anywhere within the Region, and any of the following <i>discharges</i>[^] pursuant to ss15(1) or 15(2A) RMA associated with <i>dairy intensive farming</i>[*], that do not comply with one or more of the <i>conditions</i>[^],</p>	<p>Restricted Discretionary</p>		<p>Discretion is restricted to:</p> <ul style="list-style-type: none"> (c) preparation of, <u>and compliance with a <i>nutrient management plan</i>[*]</u> for the <i>land</i>[^] <ul style="list-style-type: none"> (aa) compliance with the nitrogen leaching maximums specified in <u>Table 13.2</u> (d) <u>the implementation of reasonably practicable farm management practices for minimising measures to avoid, remedy or mitigate</u> nutrient leaching, faecal contamination and sediment losses from the <i>land</i>[^] (e) measures to exclude dairy cattle from

Rule	Activity	Classification	Conditions/Standards/Terms	Control/Discretion Non-Notification
	<p>standards and terms of Rule 13-1B:</p> <p>(a) the <i>discharge</i>[^] of <i>fertiliser</i>[*] onto or into <i>land</i>[^]</p> <p>(b) the <i>discharge</i>[^] of <i>contaminants</i>[^] onto or into <i>land</i>[^] from</p> <p style="padding-left: 40px;">(i) the preparation, storage, use or transportation of stock feed on <i>production land</i>[^]</p> <p style="padding-left: 40px;">(ii) the use of a <i>feedpad</i>[*]</p> <p>(c) the <i>discharge</i>[^] of grade Aa, Ab, Ba or Bb <i>biosolids</i>[^], <i>soil conditioners</i>[*] or <i>compost</i>^{**} onto or into <i>production land</i>[^]</p> <p>(d) the <i>discharge</i>[^] of <i>poultry farm litter</i>[*] onto or into <i>production land</i>[^]</p> <p>(e) the <i>discharge</i>[^] of <i>farm animal effluent</i>[*] onto or into <i>production land</i>[^] including:</p> <p style="padding-left: 40px;">(i) effluent from dairy sheds and <i>feedpads</i>[*]</p> <p style="padding-left: 40px;">(ii) effluent received from piggeries</p> <p style="padding-left: 40px;">(iii) sludge from farm effluent ponds</p> <p style="padding-left: 40px;">(iv) poultry farm effluent</p> <p>and any ancillary <i>discharge</i>[^] of <i>contaminants</i>[^] into air pursuant to ss15(1) or 15(2A) RMA.</p>			<p><i>wetlands</i>[^] and <i>lakes</i>[^] that are a <i>rare habitat</i>[*] or <i>threatened habitat</i>[*], and <i>rivers</i>[^] that are permanently flowing or have an <i>active bed</i>[*] width greater than 1 m</p> <p>(f) the bridging or culverting of <i>rivers</i>[^] that are permanently flowing or have an <i>active bed</i>[*] width greater than 1 m that are crossed by dairy cattle</p> <p>(g) the matters referred to in the <i>conditions</i>[^] of Rules 13-2, 13-3, 13-4, 13-4A and 13-4B</p> <p>(h) the matters referred to in the <i>conditions</i>[^] of Rule 13-6 and the matters of control in Rule 13-6</p> <p>(i) avoiding, remedying or mitigating the effects of odour, dust, <i>fertiliser</i>[*] drift or effluent drift</p> <p>(j) provision of information including the annual <i>nutrient management plan</i>[*]</p> <p>(k) duration of consent</p> <p>(l) review of consent <i>conditions</i>[^]</p> <p>(m) compliance monitoring.</p>
13-1X non-intensive farming land use activities transferring nitrogen leaching	The use of <i>land</i> [^] pursuant to s9(2) RMA for any use involving <i>production land</i> [^] other than <i>intensive farming</i> [*] and that involves transferring nitrogen leaching to another land use activity	Controlled	<p>(a) A <i>nutrient management plan</i>[*] must be prepared for the <i>land</i>[^], and provided annually to the Regional Council.</p> <p>(b) The activity must be undertaken in accordance with</p>	<p>Control is reserved over:</p> <p>(c) the implementation of the <i>nutrient management plan</i>.</p> <p>aa) compliance with the nitrogen</p>

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	<p>and any of the following <i>discharges</i>[^] pursuant to ss15(1) or 15(2A) RMA associated with <i>dairy intensive farming</i>[*]:</p> <p>(a) the <i>discharge</i>[^] of <i>fertiliser</i>[*] onto or into <i>land</i>[^]</p> <p>(b) the <i>discharge</i>[^] of <i>contaminants</i>[^] onto or into <i>land</i>[^] from</p> <p>(i) the preparation, storage, use or transportation of stock feed on <i>production land</i>[^]</p> <p>(ii) the use of a <i>feedpad</i>[*]</p> <p>(c) the <i>discharge</i>[^] of grade Aa, Ab, Ba or Bb <i>biosolids</i>[^], <i>soil conditioners</i>[*] or <i>compost</i>[*] onto or into <i>production land</i>[^]</p> <p>(d) the <i>discharge</i>[^] of <i>poultry farm litter</i>[*] onto or into <i>production land</i>[^]</p> <p>(e) the <i>discharge</i>[^] of <i>farm animal effluent</i>[*] onto or into <i>production land</i>[^] including:</p> <p>(i) effluent from dairy sheds and <i>feedpads</i>[*]</p> <p>(ii) effluent received from piggeries</p> <p>(iii) sludge from farm effluent ponds</p> <p>(iv) poultry farm effluent</p> <p>and any ancillary <i>discharge</i>[^] of <i>contaminants</i>[^] into air pursuant to ss15(1) or 15(2A) RMA.</p>		<p>the nutrient management plan prepared under (a)</p> <p>(c) The nutrient management plan prepared under (a) must demonstrate that the nitrogen leaching loss (accounting for any transferred nitrogen leaching loss) from the activity will not exceed the nitrogen leaching maximum for Year 20 as specified in Table 13.2.</p> <p>(d) Cattle must be excluded from:</p> <p>(i) <i>wetlands</i>[^] and <i>lakes</i>[^] that are a <i>rare habitat</i>[*] or <i>threatened habitat</i>[*], and</p> <p>(ii) <i>the beds</i>[^] of <i>rivers</i>[^] that are permanently flowing or have an <i>active bed</i>[*] width greater than 1 m, other than at any specific location where access is required for cattle to cross the <i>river</i>[^] in which case (e) applies.</p> <p>(e) <i>Rivers</i>[^] that are permanently flowing or have an <i>active bed</i>[*] width greater than 1 m, that are crossed by more than 1350 cattle movements per week, must be bridged or culverted, and the cattle must cross via that bridge or culvert, and run-off originating from the carriageway of the bridge or culvert must be <i>discharged</i>[^] onto or into <i>land</i>[^].</p> <p>(k) The <i>discharge</i>[^] of <i>fertiliser</i>[*] onto or into <i>land</i>[^] and any ancillary <i>discharge</i>[^] of <i>contaminants</i>[^] into air must comply with the <i>conditions</i>[^] of Rule 13-2.</p> <p>(l) The <i>discharge</i>[^] of <i>contaminants</i>[^] onto or into <i>land</i>[^] from:</p> <p>(iii) the preparation, storage, use or transportation of stock feed on <i>production land</i>[^], or</p> <p>(iv) the use of a <i>feedpad</i>[*]</p> <p>and any ancillary <i>discharge</i>[^] of <i>contaminants</i>[^] into air must comply with the <i>conditions</i>[^] of Rule 13-3.</p> <p>(m) The <i>discharge</i>[^] of grade Aa <i>biosolids</i>[*], <i>soil</i></p>	<p>leaching maximums specified in Table 13.2</p> <p>(d) the matters of control in Rule 13-6</p> <p>(e) avoiding, remedying or mitigating the effects of odour, dust, <i>fertiliser</i>[*] drift or effluent drift</p> <p>(f) provision of information including the <i>nutrient management plan</i>[*]</p> <p>(g) duration of consent</p> <p>(h) review of consent <i>conditions</i>[^]</p> <p>(i) compliance monitoring.</p> <p>(j) Transferring of nitrogen leaching to or from another property</p> <p><i>Resource consent</i>[^] applications under this <i>rule</i>[^] will not be notified and written approval of affected persons will not be required (notice of applications need not be <i>served</i>[^] on affected persons).</p>

Rule	Activity	Classification	Conditions/Standards/Terms	Control/Discretion Non-Notification
			<p><i>conditioners*</i> or <i>compost*</i> onto or into <i>production land^</i> and any ancillary <i>discharge^</i> of <i>contaminants^</i> into air must comply with the <i>conditions^</i> of Rule 13-4.</p> <p>(n) The <i>discharge^</i> of <i>poultry farm litter*</i> onto or into <i>production land^</i> and any ancillary <i>discharge^</i> of <i>contaminants^</i> into air must comply with the <i>conditions^</i> of Rule 13-4B.</p> <p>(o) The <i>discharge^</i> of farm <i>animal effluent*</i> onto or into <i>production land^</i> including:</p> <ul style="list-style-type: none"> (i) <i>effluent from dairy sheds and feedpads*</i> (ii) <i>effluent received from piggeries</i> (iii) <i>sludge from farm effluent ponds</i> (iv) <i>poultry farm effluent</i> <p>and any ancillary <i>discharge^</i> of <i>contaminants^</i> into air must comply with the <i>conditions^</i>, standards and terms of Rule 13-6.</p>	

Remaining rules in this chapter not shown