**BEFORE THE ENVIRONMENT COURT**

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| *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**<br>ENV-2010-WLG-000148 |
| *and* | **MINISTER OF CONSERVATION**<br>ENV-2010-WLG-000151 |
| *and* | **DAY, MR ANDREW**<br>ENV-2010-WLG-000158 |
| *and* | **HORTICULTURE NEW ZEALAND**<br>ENV-2010-WLG-000155 |
| *and* | **WELLINGTON FISH & GAME COUNCIL**<br>ENV-2010-WLG-000157 |
| *and* | **MANAWATU-WANGANUI REGIONAL COUNCIL**<br>Respondent |

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Statement of Evidence in Chief of **HELEN MARIE MARR** on behalf of the Minister of Conservation and Wellington Fish & Game Council

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Dated: 2 April 2012

**STATEMENT OF EVIDENCE OF HELEN MARIE MARR**

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## 1. Introduction

### 1.1 Qualifications and experience

1. My full name is Helen Marie Marr. I have a Bachelor of Resource and Environmental Planning (specialising in Environmental Science) degree with Honours from Massey University. I am also a qualified RMA decision-maker under the 'Making Good Decisions' programme.

2. I have over twelve years experience in resource management and planning. My particular areas of expertise are in policy and plan development and natural resource management, particularly issues relating to biodiversity and water management.

3. Since 2010 I have worked as a planning consultant for Perception Planning Limited, a specialist planning consultancy, of which I am also a Director.

4. Prior to joining Perception Planning I worked for Horizons Regional Council ("Horizons") for four years. I began working on the Proposed One Plan ("One Plan") in August 2006, first as Senior Policy Analyst and Project Manager, and later as One Plan Manager. I was involved in the final stages of the consultative process prior to notifying the One Plan, managed the One Plan through the formal Resource Management Act 1991 ("RMA") First Schedule process and worked with other planners, technical experts and consultants to assess the One Plan in response to submissions. I have a strong working knowledge of the One Plan, and the Horizons Region ("Region").

5. I have also worked for the Ministry for the Environment in the RMA Policy team. There I worked on preparing recommendations to the select committee on the 2005 RMA Amendment. I also worked on the early stages of development of a number of national policy statements and national environmental standards.

6. I worked for Greater Wellington Regional Council as the Policy Section Leader for the Wairarapa Division. There I led the consultation on and development of a cross council and iwi coastal development strategy. I have also worked as a development control planner in the United Kingdom, processing planning applications for the Lake District National Park Authority.

### 1.2 My previous involvement in the Proposed One Plan

7. As identified in section 1.1 above, I was previously employed by Horizons as the One Plan Manager. My role there was largely a co-ordination and leadership one, managing the work of technical and planning experts contributing to the development of the Proposed One Plan and evidence to the council level hearing. I also attended at pre-hearing meetings on the Proposed One Plan on behalf of Horizons.

8. I prepared the section 42A report to the Hearing Panel on of the following topics; the overall plan hearing (submissions on consultation, form and process), Te Aō Maori (Chapter 4 of the One Plan) and Biodiversity. I presented expert evidence in relation to non-point source pollution, in response to questions from the Hearing Panel[1], and authored the non-point source planning section of the Officers' 'End of Hearing' report for the Water Hearing. My role in other hearings was limited to the co-ordination and pre-hearing work identified above.

9. After joining Perception Planning in 2010 I was contracted by Horizons on a short term basis to help with notification of the Hearing Panel's decisions on submissions, and communication of the decisions to staff and to the public.

[1] Section 42A Report of Ms Helen Marie Marr on behalf of Horizons Regional Council, August 2009.

### 1.3 Expert Witness Code of Conduct

10. I have read and am familiar with the Code of Conduct for expert witnesses in the Environment Court Practice Note (2011). I agree to comply with this Code of Conduct. The evidence in my statement is within my area of expertise, except where I state that I am relying on the evidence of another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.

### 1.4 Scope of my evidence

11. The focus of this hearing is the provisions relating to the management of non-point source pollution.

12. At the time of writing this evidence, I have read the evidence of Ms Barton and Ms Sweetman, but have not seen the evidence of the other planning witnesses. In my evidence, I comment on Ms Barton's evidence where appropriate, and indicate areas where I agree or disagree with her evidence. I will comment on the evidence of other planning witnesses as necessary in my rebuttal evidence.

13. In the first part of my evidence I discuss the sections of the Act, national policy documents and regional policy documents that I consider tobe relevant to the assessment of the water quality – non-point source provisions of the One Plan. In doing so, I identify where I agree with or differ from Ms Barton's assessment.

14. I consider that management of non-point source pollution must be assessed in the context of management of water quality over all. I begin by evaluating the high level objectives and policies of the Regional Policy Statement (RPS) relating to water quality. In my opinion, these must be established before turning to the more specific provisions. If not it will be very difficult (if not impossible) to evaluate whether the more specific provisions appropriately implement the objectives and policies relating to water quality, or to assess their appropriateness under s32 of the Act.

15. I then turn to the provisions that relate specifically to the management of the non-point source component of water quality degradation in both the RPS and regional plan (RP) components of the POP.

16. The last part of my evidence contains an assessment of the provisions sought by the MOC and WFGC against the decisions version of the One Plan and against the provisions recommended by Ms Barton. I recommend provisions that I consider would be the most effective and efficient option to achieve the purpose of the Act, and to give effect to the National Policy Statement for Freshwater Management (NPSFM) as far as is possible within the scope of the appeals. In considering the NPFSM, I agree with the evidence of Ms Sweetman who addresses that matter in detail.

17. Through this evidence I use the following terminology to describe the versions of the One Plan:
    - The decisions version of the One Plan is described as "DV POP".
    - The notified version of the One Plan is described as "NV POP".
    - The updated version of Ms Barton's recommendations dated 28 March 2012 as "CB POP".
    - The mediated version of the One Plan is described as "MV POP".

## 2 Evidence

### 2.1 Approach to assessment of plan provisions

18. *Long Bay–Okura Great Park Society v North Shore City Council*[2] sets out a comprehensive summary of the mandatory requirements for the assessment of district plans according to the Act's statutory requirements. The list has subsequently been amended to reflect the changes made by the Resource Management Amendment Act 2005.[3] These requirements have been held to be equally applicable to the evaluation of regional plans[4] (subject to required amendments). In my view these tests are equally valid for assessing the provisions of a regional policy statement, with the appropriate amendments

[2] ENV C A078/08, at para 34 (following *Eldamos Investments Ltd v Gisborne District Council* ENV C W047/2005).
[3] *High Country Rosehip Orchards Ltd v MacKenzie District Council* [2011] NZ EnvC 387 (paragraphs 18 and 19).
[4] See *Geotherm Group Ltd v Waikato Regional Council* A047/06 (paragraph 68) and Final Decision of the Board of Inquiry into the New Zealand Transport Agency's Transmission Gully Plan Change Request dated 5 October 2011 (paragraph 159).

(including that any reference to rules do not apply because regional policy statements do not contain rules).

19. I set out below (2.1.1) a summary of the appropriate requirements for the assessment of regional policy statement and regional plan provisions in the One Plan context based on the provisions of the Act and on this caselaw. I have combined the tests for regional plans and regional policy statement where appropriate, for ease of reference.

20. This summary largely corresponds with the summary provided by Ms Barton in Attachment 3 to her evidence; however, as I will explain, in some respects I differ from Ms Barton in how these tests are to be applied to the water quality – non-point source provisions of the One Plan.

21. I note that I agree with Ms Barton about the tests which are not relevant to these proceedings, noted in her "assessment narrative' column, and have not included discussion of them below. I also note that my understanding is that the version of the Act that existed prior to the Resource Management (Simplifying and Streamlining) Amendment Act 2009 applies.[5]

### 2.1.1 Requirements for the assessment of the water quality provisions of the Proposed One Plan.

**(A) General Requirements**

1. A regional plan and regional policy statement should be designed to accord with and assist the regional council to carry out its functions so as to achieve the purpose of the Act (sections 30, 59, 61, 63 and 66(1)).

2. When preparing a regional plan or regional policy statement, the regional council must give effect to any national policy statement, the New Zealand

[5] This is because the One Plan was notified in 2007, before the Resource Management (Simplifying and Streamlining) Amendment Act 2009 came into force. Refer section 161 of that Act which applies to a proposed policy statement or plan or a change that, immediately before 1 October 2009 (a) had been publicly notified under clause 5 or 26(b) of Schedule 1 of the principal Act; but (b) has not proceeded to the stage at which no further appeal was possible.

Coastal Policy Statement and, when preparing a regional plan, must also give effect to the operative regional policy statement (s62(3) and 67(3)).

3. When preparing its regional plan, a regional council shall have regard to any proposed regional policy statement (section 66(2)(a)).

4. When preparing a regional plan or regional policy statement, a regional council must also:
   a) Have regard to any relevant management plans and strategies prepared under other Acts, and, in the case of the regional plan, to consistency with plans, policy statements and proposed plans and proposed policy statements of adjacent regional councils (sections 61(2) and 66(2)(d));
   b) Take into account any relevant planning document recognised by an iwi authority (s61(2A));
   c) Not have regard to trade competition (sections 61(3) and 66(3)).

5. The formal requirement for a regional policy statement is to *inter alia* (sections 59 and 62):

   a) provide an overview of the resource management issues of the region and state the significant issues for the region;
   b) contain policies and methods to achieve integrated management of the natural and physical resources of the region (s 59);
   c) state the objectives sought to be achieved by the statement, the policies for those issues and objectives and an explanation of those policies, and the methods (excluding rules) to be used to implement the policies (s 62(1)(c),(d) and (e));
   d) state the processes to be used to deal with cross-boundary issues; and
   e) state the local authority responsible for specifying objectives, policies and methods for the control of the use of land relating to natural hazards, hazardous substances, and indigenous biological diversity.

6. A regional plan must also state objectives, policies and rules (if any) and may state other matters (section 67(1) and (2)).

**(B) Objectives [the section 32 test for objectives]**

7. Each proposed objective in a regional plan or regional policy statement is to be evaluated by the extent to which it is the most appropriate way to achieve the purpose of the Act (section 32(3)(a)).

**(C) Policies and methods (including rules for regional plans) [the section 32 test for policies and rules]**

8. For regional plans, the policies are to “implement” the objectives, and the rules (if any) are to implement and achieve the policies (sections 67(1) and 68(1)).

9. Each proposed policy or method (including each rule) is to be examined, having regard to its efficiency and effectiveness, as to whether it is the most appropriate for achieving the objectives (section 32(3)(b)) of the regional policy statement or regional plan:
   (a) taking into account:
      (i) the benefits and costs of the proposed policies and methods (including rules); and

(ii) the risk of acting or not acting if there is uncertain or insufficient information about the subject matter of the policies, rules, or other methods (section 32(4)).

(b) if a national environmental standard applies and the proposed rule imposes a greater prohibition or restriction than that, then whether that greater prohibition or restriction is justified in the circumstances (section 32(3A)).

**(D) Rules**

10. In making a rule the regional council must have regard to the actual or potential effect of activities on the environment (section 68(3)).

**(E) (On appeal)**

11. On appeal the Environment Court must have regard to one additional matter – the decision of the regional council (section 290A).

22. I will use these tests as a broad framework to structure the next part of my evidence.

## 2.1.2 Regional Council's functions

23. The first of the statutory tests I have identified above is that a RP and RPS should be designed to accord with and assist the regional council to carry out its functions so as to achieve the purpose of the Act.

24. The functions of the regional council are set out in section 30 of the Act. Section 30(1)(c) is particularly relevant. That section of the Act provides that a regional council has the following functions for the purpose of giving effect to the Act in its region:

*"(c) The control of the use of land for the purpose of:*

*…*

*(ii) the maintenance and enhancement of the quality of water in water bodies and coastal water:*

*…*

*(iiia) the maintenance and enhancement of ecosystems in water bodies and coastal water."*

*…*

*25.* Section 30(1)(f) is also relevant as some parts of the plan relating to non-point source pollution incorporate the cumulative effects of point source discharges which are part of farming activities and which may enter water.

*"(f) the control of discharges of contaminants into or onto land, air, or water and discharges of water into water"*

*26.* Section 30(4) places some limits on how the regional council can allocate the resource. Most of those circumstances are not relevant to these proceedings as no previous plan has allocated assimilative capacity, however, sub clause (4) does give the regional council express ability to allocate the assimilative capacity among different types of activities, which I consider would include different types of land uses.

*"(4) A rule to allocate a natural resource established by a regional council in a plan under subsection (1)(fa) or (fb) may allocate the resource in any way, subject to the following; …*

(e*) the rule may allocate the resource among competing types of activities;…"*

## 2.1.3 Part 2

27. There are a number of relevant provisions of Part 2 of the Act.

28. Section 6(a) provides that it is a matter of national importance to recognise and provide for: "*the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development*".

29. While the DV POP contains a specific objective (Objective 7-2) and policy (Policy 7-8 and Policy 7-8A) on natural character, there is still a requirement to recognise and provide for the preservation of the natural character of wetlands, lakes & rivers and their margins and in the coastal environment throughout other chapters of the plan. There is also a requirement to implement the natural character policies of the RPS in the provisions of Part II of the One Plan (the

Regional Plan). The natural character of rivers and lakes can include instream and riparian habitats, and underlying ecological processes[6].

30. Of specific concern in regards to the current provisions being considered is the impact of landuse on natural character, including water quality from point and non point source pollution, and riparian and instream physical habitat through stock access to waterbodies and their riparian margins. Poor water quality, including that contributed to by non-point source pollution, can adversely affect natural character of these waterbodies, primarily through the proliferation of periphyton and algal blooms, and through increases in instream sediment levels, which can adversely impact on the life supporting capacity of freshwater resources (as described in the evidence to this hearing of Associate Professor Death and Dr Ausseil and the s42a reports presented at the council hearing[7] of; Dr Barry Biggs, Ms McArthur, Dr Young, Dr Hayes, Dr Gibbs, and Dr Quinn, for the Regional Council).

31. Section 6(c), provides that it is a matter of national importance for decision-makers to "*recognise and provide for the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna*". The evidence of Dr Kelly on behalf of the MOC describes the biodiversity values of the coastal lakes[8], and I am aware that these lakes have also been identified as rare or threatened habitats through the biodiversity provisions of the POP, and recognised in policy as meeting the criteria for being considered 'significant' under section 6(c)[9]. A number of water management subzones identified in the plan as being significantly impacted by intensive agricultural or/and horticultural land use[10] are recognised in the POP as Sites of Significance Aquatic (SOS-A). These sites were determined by the presence of 'threatened' or 'regionally rare' native fish species (Giant Kokopu, Banded Kokopu, or Shortjaw Kokopu, Redfin

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[6] Pigeon Bay Aquaculture Ltd v Canterbury Regional Coucil C179/30,40
[7] And included in the Technical Evidence Bundle
[8] Dr Kelly EIC paragraphs 16 – 20
[9] The relevance of significance without a site visit to confirm their condition is under appeal at the time of writing, however it is the position of MOC and WFGC (and HRC) that these habitats are significant without the need for a site assessment to consider condition.
[10] including the Upper Manawatu (Mana_1a), Mangatewainui (Mana_1b), Upper and Lower Tamaki (Mana-3 and 5b), Upper Kumeti (Mana_4), Oruakeretaki (Mana-5b), Upper and middle Mangatainoka (Mana_8a and 8b), Makakahi (Mana_8d), Upper Gorge (Mana_9a), Mangaatua (Mana_9c), Coastal Rangitikei (Rang_4a), and Waikawa,

bully, Blue gill bully, Lamprey, Koaro, Longfinned eel), and are considered to be biodiversity hotspots with particularly diverse aquatic communities, or rare or threatened aquatic habitat[11].

32. Section 6(e) identifies "the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga" (emphasis added) as a matter that must be recognized and provided for as a matter of national importance. Chapter 4 of the POP recognizes the impacts that poor water quality has on the mauri of the water and how this affects the relationship of Maori with that water, and its suitability for cultural uses (Issue (a) Table 4.1). Punahau/Waipunahau (Lake Horowhenua) is specifically mentioned as being considered 'culturally unclean' as a result of this degradation (Issue (c)).

33. Section 7 of the Act sets out other matters that "particular regard" must be given to. The subsections particularly relevant to these proceedings are:

(aa) the ethic of stewardship

(b) the efficient use and development of natural and physical resources (in relation to the efficient use of productive land and providing for the development of the most productive land for the most productive uses through the LUC allocation of nitrogen leaching maximums),

(c) the maintenance and enhancement of amenity values (poor water quality has a negative impact on the amenity value of waterbodies, in particular recreational values are impacted upon by algal blooms and high levels of faecal contamination making it unsafe to undertake contact recreation activities, and high levels of periphyton making the bed of the river unsightly and slippery to walk on[12])

(d) the intrinsic value of ecosystems and

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[11] s42A report Ms McArthur, para 57, 2009

[12] These values and the effects of poor water quality on these values are described in the evidence of Ms McArthur paragraph 68, page 23, paragraphs 222 – 226, pages 80 – 81, paragraphs 333 - 351, pages 145 – 151 (2009)

(f) maintenance and enhancement of the quality of the environment (the evidence of Associate Professor Death[13] describes how ecosystems and the quality of the environment are adversely affected by the impacts of non-point source pollution), and

(h) the protection of the habitat of trout and salmon – (the evidence of Ms Jordan identifies the impact of poor water quality on the habitat of trout in target catchments and Rangitikei River[14].)

## 2.1.4 National and Regional Policy Statements

34. The second of the statutory tests I have identified above is that a RP and RPS must give effect to any NPS.

35. I agree in large part with the national planning instruments identified by Ms Barton in her Attachment 3. I do not in all respects agree with Ms Barton's assessment or application of those provisions. I set out below some additional matters that I consider relevant.

### *2.1.4.1 New Zealand Coastal Policy Statement 2010 (NZCPS)*

36. The NZCPS came into effect on 3 December 2010 after the DV POP was released. Nevertheless the implications of the NZCPS must now be considered.

37. I generally agree with Ms Barton's assessment[15] of the relevance of the NZCPS to the One Plan in relation to water quality, but do not agree that the DV POP provisions will give effect to the NZCPS. Ms Barton highlights the NZCPS provisions relating particularly to water quality (presumably referring to objective 1 and policies 21-23). However, I also consider that NZCPS provisions relating to Indigenous biological diversity and the precautionary approach are relevant to these proceedings. Particularly, some parts of the water management sub-

[13] Associate Professor Death EIC paragraphs 31 – 74, 80 - 104
[14] Ms Jordan EIC paragraphs 6.1 – 9.12
[15] Barton EIC Attachment 3

zones containing the coastal lakes can be considered to be part of the 'coastal environment' as it is addressed in Policy 1 of the NZCPS[16]. Also, the coastal marine area is the ultimate receiving environment for water from all the water management sub-zones predominated by rivers.

38. Policy 21 of the NZCPS is particularly relevant to appeals relating to water quality.

> *Policy 21 Enhancement of water quality*
> *Where the quality of water in the coastal environment has deteriorated so that it is having a significant adverse effect on ecosystems, natural habitats, or water based recreational activities, or is restricting existing uses, such as aquaculture, shellfish gathering, and cultural activities, give priority to improving that quality by:*
> *(a) identifying such areas of coastal water and water bodies and including them in plans;*
> *(b) including provisions in plans to address improving water quality in the areas identified above;*
> *(c) where practicable, restoring water quality to at least a state that can support such activities and ecosystems and natural habitats;*
> *(d) requiring that stock are excluded from the coastal marine area, adjoining intertidal areas and other water bodies and riparian margins in the coastal environment, within a prescribed time frame; and*
> *(e) engaging with tangata whenua to identify areas of coastal waters where they have particular interest, for example in cultural sites, wāhi tapu, other taonga, and values such as mauri, and remedying, or, where remediation is not practicable, mitigating adverse effects on these areas and values.*

39. It is my view that for the Plan to give effect to the NZCPS the coastal lake catchments which are degraded need to be managed in a manner to improve water quality. A policy response within the plan that will not actively lead to water quality improvements will not give effect to the NZCPS.

40. Policy 3 sets out that a need to adopt precautionary approach. In my view, the relatively limited information about the state of water quality in the coastal

[16] In particular Dr Kelly describes in his EIC (paragraphs 13 - 18) that the lowland coastal portions of the Manawatu-Whanganui region contain a relatively large number of dune lakes, comprising 57 of the 330 that occur nationally. Eighteen of these lakes are within the four water management subzones which are identified as a priority for the management of intensive farming. The lakes are formed by coastal processes, with most of them clustered within the landscape occurring along the margins of dune swales where river drainage has been blocked by dune formation.

environment, particularly in relation to the coastal lakes, is balanced by evidence regarding 'significantly adverse' effects on lake water quality[17].

*Policy 3 Precautionary approach*

(1*) Adopt a precautionary approach towards proposed activities whose effects on the coastal environment are uncertain, unknown, or little understood, but potentially significantly adverse.*

41. As I have explained in paragraph 31 above, the coastal lake catchments have high biodiversity values, and these values are identified in Policy 11 of the NZCPS. There is strong direction in this policy to protect indigenous biological diversity in the coastal environment.

Policy 11: *Indigenous biological diversity (biodiversity)*:

*"To protect indigenous biological diversity in the coastal environment:*

*(a) avoid adverse effects of activities on:*

*(i) indigenous taxa that are listed as threatened or at risk in the New Zealand Threat Classification System lists;*

*(ii) taxa that are listed by the International Union for Conservation of Nature and Natural Resources as threatened;*

*(iii) indigenous ecosystems and vegetation types that are threatened in the coastal environment, or are naturally rare;*

*(iv) habitats of indigenous species where the species are at the limit of their natural range, or are naturally rare;*

*(v) areas containing nationally significant examples of indigenous community types; and*

*(vi) areas set aside for full or partial protection of indigenous biological diversity under other legislation; and*

*(b) avoid significant adverse effects and avoid, remedy or mitigate other adverse effects of activities on:*

*(i) areas of predominantly indigenous vegetation in the coastal environment;*

*(ii) habitats in the coastal environment that are important during the vulnerable life stages of indigenous species;*

*(iii) indigenous ecosystems and habitats that are only found in the coastal environment and are particularly vulnerable to modification, including estuaries, lagoons, coastal wetlands, dunelands, intertidal zones, rocky reef systems, eelgrass and saltmarsh;*

*(iv) habitats of indigenous species in the coastal environment that are important for recreational, commercial, traditional or cultural purposes;*

*(v) habitats, including areas and routes, important to migratory species; and*

[17] Dr Kelly EIC paragraphs 21 – 24 and table 3 page 28

*(vi) ecological corridors, and areas important for linking or maintaining biological values identified under this policy."*

42. While Policy 11 must be read along with the other objectives and policies of the NZCPS, I do not traverse those other objectives and policies in my evidence as I believe these are the most relevant to the matters under appeal.

### 2.1.5 National Policy Statement for Renewable Electricity Generation (NPSREG) and the National Policy Statement on Electricity Transmission (NPSET)

43. I agree with Ms Barton's assessment[18] that the NPSREG and the NPSET are not relevant to these proceedings.

### 2.1.6 National Policy Statement for Freshwater Management (NPSFM)

44. Ms Sweetman has provided evidence assessing the provisions of the POP against the direction set out relating to water quality in the National Policy Statement for Freshwater Management (NPSFM). I agree with her assessment that it is appropriate for the POP to reflect the direction of the NPSFM if it is reasonable to do so in the present circumstances. I also agree with Ms Sweetman's conclusion that the NV POP (with amendments sought by WFGC and the MOC) will give better effect to the NPSFM than any of the other versions of the POP.

### 2.1.7 Proposed Regional Policy Statement for the Manawatu-Wanganui Region

45. Ms Barton, in her discussion of the regional plan tests[19], adopts the test contained in s66(2)(a) that "*when preparing or changing any regional plan the regional council shall have regard to - (a) any proposed regional policy*

[18] Barton para 31.d and paras 14 – 17 Attachment 2, EIC.
[19] Barton EIC Attachment 3

*statement in respect of the region*". I acknowledge that the RPS provisions contained in Part I of the One Plan are still proposed. However, as soon as the RPS component of the One Plan becomes operative, then Part II of the Regional Plan, will be required to *give effect to* the RPS.[20]

46. Chapter 10A of the RPS sets out the timing for this in Method 10A-2, which states: *"Regional plans (except for Part II of this Plan which already gives effect to Part I) and district plans must be changed to give effect to Part I-Regional Policy Statement of the Plan on the first review or change or variation to the regional plan or district plan or within five years, whichever is the earliest*".

47. It is clear that Part II of the One Plan was intended to give effect to Part I (the proposed RPS) now. In my view, this is appropriate and promotes integrated management. For the purposes of the current proceedings then the level of 'regard' had to the RPS provisions of the One Plan when forming an opinion about the provisions in Part II – the Regional Plan should be high. Indeed, if Part II does not give effect to Part I following the resolution of appeals, there will be a 'disjunct' when the One Plan becomes operative requiring a further review of the Regional Plan component which is clearly not desirable and, as stated previously, was not intended.

48. My view on this is further reinforced by Objective 11A-1 which states as an Objective of the One Plan is to "*regulate activities in a manner which gives effect to the provisions of Part I of this Plan, the Regional Policy Statement"* (emphasis added). This Objective would require the Regional Plan component to *give effect to* the RPS provisions of the One Plan now.

49. I discuss the relevant provisions of Part 1 of the One Plan in section 2.2.2 below.

### 2.1.8 Management Plans and Strategies under other Acts

[20] Under section 67(3) of the Act.

50. Ms Barton discusses two iwi resource management plans when discussing the requirement to take into account any relevant management plans/strategies prepared under other Acts.[21] I am not aware of any other relevant plans and strategies. Plans and strategies prepared under the Conservation Act 1987 and National Parks Act 1980 are also relevant under this requirement. These are the Conservation General Policy[22], General Policy for National Parks[23]; Conservation Management Strategies[24] and National Park Management Plans.[25] Water quality of coastal lakes is identified as a conservation issue in the relevant Management Plans.

### 2.1.9 Significant Resource Management Issues for the Region and the relevance of Non-Statutory documents

51. The RPS must state the significant resource management issues for the Region. Ms Barton's Overview Statement of evidence[26] outlined the process that was used during development of the One Plan. Following extensive public consultation, surface water quality degradation was identified as one of four significant resource management issues for the Region.

52. This problem is described in section 1.3 of Chapter 1, which identifies that: *"Run-off of nutrients, sediment and bacteria from farms is now the single largest threat to water quality in the Region. In some water bodies it is risky to swim or gather food, and aquatic life is being damaged."*

53. This issue is also discussed in the background to Chapter 6 and in Issue 6-1 Water Quality.

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[21] Attachment 4 of Ms Barton's EIC.
[22] May 2005, amended in June 2007.
[23] April 2005, amended June 2007.
[24] Tongariro Taupo Conservation Management Strategy (2002, amended 2012), Wanganui Conservation Management Strategy (April 1997), Hawkes Bay Conservation Management Strategy (1994) and Wellington Conservation Management Strategy (1996).
[25] Tongariro National Park Management Plan (November 2006) and Whanganui National Park Management Plan (March 1989).
[26] 15 December 2011 "Overview Statement, as Directed by Judge Dwyer".

## 2.2 Assessment of POP provisions

54. This section of my evidence identifies the key issues for this hearing, summarises the evidence and examines the alternatives and sets out my conclusions based on the statutory tests identified in the previous section, particularly the section 32 tests.

55. My approach to considering the evidence has been to;

    a. identify the high level planning provisions of the RPS, then
    b. identify where these high level objectives and policies are not currently being achieved, and where the cause is primarily non-point source pollution;
    c. identify the land use activities that are contributing to this; and
    d. identify the most appropriate mechanism for managing those causes of poor water quality.

56. I consider this approach to be consistent with the tests for regional plans and policy statements I have set out in section 2.1.1 above.

57. I also believe the step by step process I outline above is the appropriate way for the policies of the RPS and the Plan to approach the issue, and I recommend changes to the policy framework to reflect this.

### 2.2.1 Water management approach in the POP

58. Ms Barton outlines the 'framework' of the POP for managing water quality in her paragraphs 24 – 36. This outlines an approach of defining water management zones, assigning community values for water bodies within those zones, and developing water quality 'numerics' to provide for these values. I consider this 'framework' to be an appropriate way to achieve integrated management of the region and agree with Ms Sweetman that it appropriately helps to implement the provisions of the NPSFM.

### 2.2.2 High level planning provisions

59. In this section I will discuss the higher level planning provisions relating to water quality that are relevant to these proceedings.

60. In my opinion, the relevant provisions of the RPS are (using DV POP wording):

- Objective 6-1 Water Management Values
- Objective 6-2 Water Quality
- Policy 6-1 Water Management Zones and Values (including Table 6.2)
- Policy 6-2 Water quality targets
- Policy 6-3 Ongoing compliance where water quality targets are met
- Policy 6-4 Enhancement where water quality targets are not met
- Policy 6-5 Management of activities in areas where existing water quality is unknown

61. In my opinion, these particular provisions of the RPS clearly set out the overall water management framework, and the highest level policy framework relating to water quality. They are effectively "framework" provisions and, in my opinion, the POP is structured so that other provisions of the POP flow from them. For example, the Policies in section 6.4.2.3 identify how land use, discharges to water and discharges to land will be managed in order to achieve the framework provisions.

62. While the wording of some of these framework provisions has largely been resolved through the mediation process, it is my understanding that there are some outstanding appeal points relating to these provisions. Where this is the case, I have made brief comment on the various wording options and make a recommendation as to the most appropriate wording.

63. I have set out the various wording variations for these provisions in my Appendix 1, which covers the NV POP, DV POP, CB POP and the MV POP. This table contains some of the same information as Appendix 1 in Ms Sweetman's evidence, and I repeat it in my evidence for ease of reference.

64. I also adopt the evidence of Ms Sweetman in relation to her analysis of these provisions against the NPSFM.

65. I discuss the remaining relevant provisions of the RPS, along with provisions of Part II – the Regional Plan, in section 2.3.7 below.

#### *2.2.2.1 Objective 6-1*

66. This is the first objective in Chapter 6 and sets the overall approach to water management in the Horizons Region, which, in my understanding, is that water

bodies are managed to support the Values of those water bodies identified in Schedule AB. These values, in respect to water quality, are articulated through the "numerics"[27] set in Schedule D. When the numerics are met, then the Value is achieved. When the numerics are not met, the focus is on managing water so as to achieve the numerics, and therefore, the Values.

67. I agree with the evidence of Ms Sweetman that setting Values and management objectives in Schedule AB is appropriate and gives effect to the NPSFM.

68. The DV POP of this objective uses the phrase 'has regard to the Values in Schedule AB'. The appeal of WFGC sought that this Objective be changed to delete the phrase 'has regard to' and replace it with the phrase 'sustains their life supporting capacity and recognises and provides for' . The appeal of the MOC also sought that the objective 'recognise and provide for' particular Schedule AB values.

69. The Values set the current or desired state for the water bodies. The Values can be considered 'freshwater objectives' under the NPSFM as set out in the evidence of Ms Sweetman. Therefore, I do not consider it appropriate for the objective to set a management goal to simply 'have regard to' these values.

70. The phrase "have regard to" has been considered in various Court cases and can be considered to mean that the decision maker must 'turn their mind' to the various matters and 'give them genuine attention' [28]. However, it is up to the decision maker in each circumstance to decide which matters are relevant and what weight should be given to each. In my view, because the Values form such a central role in the management framework for freshwater set up in the One Plan, it is not appropriate to simply 'turn our mind to' them when managing surface water bodies. In my view, an objective should be a clear statement about the community's intended outcome to address a resource management issue. In the case of water quality, it appears to be clear that the issue is that water quality

[27] I use the phrase numeric here, for simplicity but will address this terminology later in my evidence

[28] *Foodstuffs (South Island) Limited v Christchurch City Council* [1999] NZRMA 481(HC) 487.

in many of the Region's water bodies is not at a standard to support the values attributed to those water bodies[29].

71. The MV POP of this Objective[30] uses the phrase 'advances the achievement of the Values…'. No interpretation advice on this phrase has been proposed to date, and I am not aware of any previous cases where this wording has been considered. However, my understanding of these words is that it would require that the management of freshwater must move in a direction closer to the Values being achieved, and, by contrast, not move in a direction where Values are not achieved or stand still. In my view, this is a more appropriate way to achieve the purpose of the Act than simply having regard to the values, as set out in the DV POP.

72. The NV POP used the phrase 'recognises and provides for the values…'. In prefer this phrase as it is much clearer, more certain and therefore is more appropriate than either of the other two variations. However, as the mediated version of this objective has been agreed to by most parties to these appeals, that is the version that I will use for the remainder of my analysis.

73. The DV POP of this Objective removed the reference to 'sustains their life-supporting capacity' from the NV. The mediated version re-introduces the concept with the wording 'safe guards their life supporting capacity'. I believe that reference to life supporting capacity is appropriate. The definition of sustainable management in section 5 of the Act includes 'safeguarding the life supporting capacity of air, water, soil and ecosystems'. This wording is also consistent with the NPSFM.

74. I acknowledge that Schedule AB contains a Value of Life Supporting Capacity (LSC). However, the reference to those Schedule AB Values in this objective is to 'have regard to' them (in the DV) or to 'advance their achievement' (in the NV). Both of these wording options in my view convey a lower level of consideration of life supporting capacity than that required by the purpose of the Act and to give effect to the NPSFM.

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[29] See for example Issue 6-1

[30] To which most, but not all, parties to these appeals have agreed

75. Reference in this objective to safeguarding the life supporting capacity of surface water bodies and their beds in the mediated version of the objective is a more appropriate way to achieve the purpose of the Act than no reference to life supporting capacity in the DV or the reference to 'sustains' in the NV.

#### *2.2.2.2 Objective 6-2*

76. Objective 6-2 is the highest level objective in the RPS that sets out the goals specifically for water quality in the Region. I understand there are some outstanding appeal points of other parties relating to this provision. Wellington Fish and Game and the Minister of Conservation have no appeal points on this objective.

77. This objective puts in place a framework for maintaining water quality at a level that will provide for the Values of the relevant waterbodies, where those levels are met; and requiring that degraded water quality is enhanced. The reference to Schedule AB Values is appropriate, for the same reasons as outlined in my assessment of Objective 6-1 above.

#### *2.2.2.3 Policy 6-1 Water Management Zones and Values (including Table 6.2)*

78. Policy 6-1 introduces the Water Management Zones and Values framework contained in Schedules A and AB into the RPS. A number of changes have been agreed in mediation. I support the changes to include direction to 'safeguard life supporting capacity and advance the achievement of the Schedule AB Values' for the same reasons set out in section 2.2.2.1 of this evidence.

79. In addition to the changes agreed in mediation, a separate agreement was reached between Horticulture New Zealand and Horizons Regional Council[31] relating to this Policy, which also involved incorporating an additional Value into Schedule AB. I will now address the provisions agreed by those parties and make recommendations in relation to the changes sought.

80. The memo of agreement records that Horizons and Horticulture New Zealand agree to include an additional Value in Schedule AB, and reflect that Value in

[31] Memo attached as Appendix 3 to Mr Keenans evidence

Table 6.2, and to consequential changes to incorporate maps and a table of map references that define where the Value applies. The additional Value is Domestic Food Supply (DFS). The identified 'Management Objective' is 'the water is suitable for domestic food production'. This Value is identified as applying to the entirety of several Water Management zones.

81. The memo does not record the reasons that this new Value is required; only that it addresses several appeal points. Evidence filed on behalf of Horticulture New Zealand to date does not address this issue. I have not been provided with any evidence to support its inclusion. Based on my knowledge of this issue, I expect that the inclusion of the Value is to ensure that water is of sufficient quality to ensure it is suitable for the irrigation and onsite processing of human food crops. Values of 'irrigation' and 'industrial abstraction' are already included in Schedule AB and apply across the whole region. In my view, these should be sufficient to provide for the uses identified. As such, I do not support the inclusion of this additional value as it is essentially repetitious and does not add anything to the framework.

82. If there was evidence to suggest that the current 'irrigation' and 'industrial abstraction' values are insufficient, I would still not support its inclusion in its current form. In my view, both the Management Objective and the spatial definition are too broad. The Management Objective as proposed is currently very broad and should be refined to clearly identify what aspects of the water and use it applies to. Based on my understanding of the issue, I believe it should be refined to state 'the quality of the water is suitable as a supply for the irrigation and processing of crops for human consumption'.

#### *2.2.2.4 Policy 6-2 Water quality standards / targets/ numerics*

83. This policy explains that water quality 'targets' have been set to meet the Values for each of the Water Management Sub-zones and that these 'targets' in Schedule D are to be used to guide and inform decision-making on resource consent applications involving water quality issues. It also provides for these 'targets' to be set as permitted activity conditions for particular activities.

84. I consider that this policy is appropriate, as it sets out how the Values contained in Schedule AB are to be measured; that is, through the 'targets' set in Schedule D.

85. Wellington Fish and Game and the MOC have no appeal points on this objective but do have appeal points relating to the terminology to describe the water quality 'targets' throughout the One Plan. I am addressing this terminology here, as it is the first place in the plan the terminology is used.

86. The NV POP used the term 'standards' to describe the water quality parameters in Schedule D. The DV POP changed this to refer to 'targets'. As outlined by the technical experts, the water quality provisions were established to protect those values that had the potential to be affected by water quality or where maintenance of that particular value required specific water quality limits to be set[32]. As stated by Dr Ausseil (EIC, paragraph 3.11) "*the general guiding principal used was that the water quality standards would represent the point beyond which some of the values would be compromised*". In essence, the standards represent the environmental bottom line which, if breached, would cause the value to be compromised. I agree with the evidence of Ms Sweetman that these parameters describe water quality 'limits' as set out in the NPSFM, and that it would be more appropriate to refer to them as such in the POP. I also note that use of the term 'limits' is consistent with the terminology used by the technical experts through their evidence and caucusing[33]. This policy sets out the relationship between the Values contained in Schedule AB and the limits in Schedule D.

87. This policy establishes the framework for policies 6-3 to 6-5, setting out the approach that the regional council is to follow when the relevant limits in Schedule D are or are not met.

#### *2.2.2.5 Policy 6-3 Ongoing compliance where water quality targets are met*

88. This policy provides for the ongoing maintenance of water quality, where the water in the relevant waterbody meets the limits set in Schedule D, so as to maintain the Values in Schedule AB. This appropriately achieves Objectives 6-

[32] Dr Ausseil EIC paragraph 3.7

[33] Record of Technical Conferencing on Nitrogen Limits and Water Quality sub-topic in relation to surface water quality – non point source discharges (29 March 2012)

1 and 6-2. This policy is consistent with the NPSFM. It also includes appropriate provisos for situations where all the relevant limits in Schedule D might not be met by a particular waterbody. The limits that are met are to be maintained. I consider that the amendments agreed to through mediation to limit the reasonable mixing provision to only apply to point source discharges are appropriate given that a mixing zone cannot be identified for non-point source discharges.

#### *2.2.2.6 Policy 6-4 Enhancement where water quality targets are not met*

89. Policy 6-4 provides for the enhancement of water quality, where the water quality of the relevant waterbody does not meet all the relevant limits set in Schedule D.

90. I consider that it is appropriate that degraded water quality should be managed so as to require enhancement to a standard that would meet the Schedule D limits, and therefore also meet the Schedule AB Values in respect of water quality.

91. I do not consider that the wording in the DV POP is appropriate as it does not achieve Objectives 6-1 and 6-2. Requiring degraded water quality to be maintained if it cannot "reasonably practicably" be enhanced is not consistent with the purpose of the RMA, nor does it give effect to the NPSFM.

92. I consider that the amendments sought to this policy to remove reference to reasonable mixing and 'reasonably practicable', and to add in reference to the Schedule D limits and Schedule AB Values (as shown in the MV POP policy 6-4 and in my recommended wording changes) would give better effect to the NPSFM, as these amendments would require the enhancement of water quality so as to meet the relevant objectives for the waterbodies which are set through the Schedule AB Values. Further assessment of the consistency of this policy against the NPSFM is provided in Ms Sweetman's evidence. The amendments would also appropriately achieve Objectives 6-1 and 6-2.

93. I do not consider that reference to Policies (in a manner consistent with Policy 6-7, 6-7A, 6-7B and 6-8 (as shown in CB POP)) is appropriate for two reasons. Firstly, and most importantly, I do not think it is appropriate for this policy (which sets a water management strategy) to be subject to the policy which sets out how the strategy will be implemented. This would be poor drafting which would

diminish Policy 6-4. Secondly, if any reference is to be made it should be made to all the policies which implement the strategy, including those relating to point source discharges. I consider that it would be most appropriate to delete this qualifying part of the policy, as I have shown in my Appendix 2.

#### *2.2.2.7 Policy 6-5 Management of activities in areas where existing water quality is unknown*

94. This policy provides for situations where there is limited information available on the water quality in a particular waterbody and sets a precautionary approach of the existing water quality being at least maintained. This is to ensure that there is no further deterioration in water quality that would see any further variance from the relevant Schedule D limit, if it that limit is not met. I believe the MV POP is an appropriate policy to achieve the objective, however, I do not think the footnote reference to toxicants makes sense in this location. For this reason I have not shown it in my recommended changes.

#### *2.2.2.8 Conclusion*

95. Together, and with the amendments largely agreed to at mediation and that I recommend in my Appendix 2, the relevant objectives and policies in the RPS set out a framework that seeks that water quality is to be managed to achieve three main goals:

    a. Safeguard life supporting capacity;
    b. Maintain water quality where it is already achieving the water quality limits set out in Schedule D; and
    c. Improve water quality where it is degraded in order to move towards achieving the water quality limits in Schedule D and the Management Objectives for Schedule AB values.

### 2.3 Key Issues

96. In the next sections of my evidence I assesses the non-point source provisions of the POP against the statutory tests. To do this without undue repetition I have done this by first addressing the key questions that need to be resolved in order to identify the appropriate form of the planning provisions. These are:

    a) Where does non-point source pollution need to be managed in order to achieve the objectives?

b) Which land uses are contributing to the water quality objective not being achieved?
c) For each land use, what changes can be made to help achieve the objective?
d) What is an appropriate nitrogen loss limit?
e) What are appropriate restrictions for stock access to waterbodies?

97. I assess the evidence against the statutory tests I have identified in section 2.1.1 above.

### 2.3.1 Where does non-point source pollution need to be managed in order to achieve the objectives?

98. As identified above, the RPS seeks to manage water quality in order to safeguard life-supporting capacity and maintain and enhance water quality in order to achieve the Schedule AB values, as measured by the Schedule D limits.

99. Therefore, in order to achieve these objectives and implement these policies, non-point source pollution needs to be managed in water management subzones where:

a. The Schedule D limits are not being met; or
b. Life-supporting capacity is not being safeguarded; and in either case
c. A major contributor to a or b is non-point source pollution (that is, point source discharges are not the major contributor).

100. I understand that key parameters in Schedule D relating to non-point source pollution are limits for nitrogen, phosophorous, faecal contamination and sediment[34].

101. I understand from the evidence of Associate Professor Death[35] that the concept of 'ecological health' is the appropriate technical interpretation of the concept of 'life-supporting capacity'. Dr Roygard et al also state that "the degree to which many sites do not meet the MCI targets indicates that life supporting capacity and trout fishery values are being compromised…". I also understand

[34] Record of Technical conferencing on LUC/Best practice sub-topic in relation to surface water quality – non-point source discharges held on 23rd March 2012. Addressing Point 2.

[35] Associate Professor Death EIC, paragraph 101 - 105

from Associate Professor Death's evidence[36] that the levels of periphyton cover, MCI, and dissolved oxygen (DO) are appropriate indicators of ecosystem health and, therefore, life-supporting capacity.

102. In summary, the key water quality limits relating to the impact of non-point source pollution on a waterbody's Values and its life-supporting capacity are:

a. Nitrogen
b. Phosphorous
c. Faecal contamination
d. Suspended and Deposited Sediment
e. Periphyton
f. MCI
g. Dissolved Oxygen

103. The current state of the environment is set out in Ms McArthur's evidence at the council level hearings (2009)[37] and for some parameters is updated in the evidence of Dr Roygard et al[38]. Dr Ausseil[39] and Associate Professor Death[40] have summarised the current state of the Coastal Rangitikei catchment. Dr Kelly[41] on behalf of the MOC has summarised information relating to the lake catchments. I have summarised this information for the catchments that the MOC and WFGC are seeking to have included for control of non-point source pollution in Appendix 3. I note that the MOC originally sought to include Mowhanau, Makatuku and Mangawhero, but no longer seek their inclusion.

104. The information summarised in Appendix 3 shows that all the catchments currently sought to be included in a management regime for non-point source pollution by the MOC and WFGC are generally not achieving the water quality limits relevant to non-point source pollution or life-supporting capacity or both.

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[36] Associate Professor Death EIC paragraph 34, 35, 56, 57

[37] Ms McArthur s42a Report
[38] EIC of Dr Roygard, Ms McArthur and Ms Clark
[39] Dr Ausseil EIC paragraphs 7.1 – 7.43
[40] Associate Professor Death EIC paragraphs 80 - 87
[41] Dr Kelly EIC Table 3, page 28

105. This is largely supported by the conferencing statement of the ecology experts in relation to water quality[42], that all (except for the Waitarere lakes where a decision could not be made due to a lack of information) of the identified catchments do not meet some or all of the relevant water quality limits, and that management action is required.

106. I am not aware of any evidence that the major cause of these breaches of the limits I have identified in a – d above is caused by point source discharges. Calculations undertaken by Dr Roygard[43] and Dr Ausseil[44] to estimate non-point source loads for nitrogen and which take into account measured point source discharges support the conclusion that the major contributor to elevated levels of pollutants, nitrogen in particular, in these water management sub-zones is non-point source.

107. In this respect I disagree with the conclusion made by the hearing panel and by Ms Barton[45] to exclude the Rangitikei WMZ based (in part) on the contribution of point source discharges to the total pollution.

108. Ms Barton has also assumed that existing dairy farming is the only regulated land use when considering which catchments should be considered for inclusion in a regulatory regime, whereas I have looked at the catchment as a whole including the impacts of all land uses. I believe this is more appropriate when considering how to achieve the objective of improved water quality for the whole catchment. This may be a reason for the different conclusions Ms Barton and I have reached on this issue.

#### *2.3.1.1 Summary*

109. In my view, in order to achieve the objectives and implement the policies, to maintain and enhance water quality, non-point source pollution should be managed in catchments where non-point source pollution is the major contributor to water quality objectives not being met.

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[42] Record of Technical Conferencing on Nitrogen Limits and Water Quality Sub Topic in relation to Surface Water Quality – Non Point Source Discharges (21 March 2012)
[43] Roygard, J., McArthur, K., Clark, M. Joint Technical Expert Statement. Table 6, page 23
[44] Dr Ausseil EIC, para 7.35
[45] Barton EIC Para 112 (c)

110. Based on the evidence, non-point source pollution in the following catchments needs to be managed in order to achieve the objectives and policies of the RPS.

- Mangapapa Mana_9b
- Upper Mangatainoka Mana_8a
- Middle Mangatainoka Mana_8b
- Lower Mangatainoka Mana_8c
- Makakahi Mana_8d
- 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
- Hopelands-Tiraumea Mana_6
- Upper Gorge Mana_9a
- Mangaatua Mana_9c
- Coastal Rangitikei Rang_4
- Lake Horowhenua Hoki_1a
- Hokio Hoki_1b
- Waikawa West_9a
- Waikawa West_9b
- Lake Papaitonga West_8
- Northern Manawatu Lakes West_6
- Kaitoke Lakes West_4
- Wanganui Lakes West_5

### 2.3.2 Which land uses are contributing to the water quality objectives not being achieved?

111. All types of land use in a catchment contribute to the levels of contaminants found in waterbodies[46]. 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 have used the term 'intensive land uses' to identify those land uses where the risk and contribution of non-point source pollution is recognised as being higher than other (non-intensive) land uses. I summarise the evidence for this in the following paragraphs, beginning with the evidence around contribution of nitrogen, and then with other contaminants.

#### *2.3.2.1 Nitrogen pollution*

112. Associate Professor Death's [47] evidence identifies a strong correlation between intensification of land use and lower MCI scores, which indicate pollution and impacted life-supporting capacity.

113. A technical report by Dr Clothier et al[48] analysed a number of different land uses to understand their contribution to non-point source pollution of nutrients. This identified and ranked the likely nutrient losses from four farming types. The identified land uses were (in order of greatest losses) market gardening, cropping, dairying and intensive sheep and beef farming[42, 49].

114. The contribution of these intensive land uses to nutrient pollution is also recognized at the national level by industry, who identify in The Primary Sector Water Partnership Leadership Document[50] that dairying, arable and horticulture operations account for 2/3 of total nitrogen losses and 1/3 of total phosphorus losses.

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[46] Record of Technical Conferencing on LUC/ Best Practice Sub-Topic in relation to Surface Water Quality – Non Point Source Discharges (23 March 2012) Paragraph 7
[47] Associate Professor Death EIC paragraphs 37 and 38, Figure 3
[48] Clothier, B., MacKay, A., Carran, A., Gray, R., Parfit, R., Francis, G., Manning, M., Duerer, M., & Green, S. (2007) Farm Strategies for Contaminant Management – A report by SLUI, the Sustainable Land Use Research Initiative, for Horizons Regional Council, Table 1, page 16
[49] Dr Dewes EIC Table 1, page 13 (reproduced from Clothier 2007)
[50] May 2008

115. The expert conferencing note of farm management experts[51] identified that, in particular, dairy farming has a high nitrogen loss per hectare relative to other pastoral land uses, and that activities such as commercial vegetable production and cropping also present significant opportunities for improvement[42, 52].

116. Intensive land uses can have a significant impact on nitrogen loads in waterbodies, even if they occupy a relatively small percentage of the total catchment. For example, in the Waikawa catchment horticulture could be contributing between 10% - 22.9% of the total non point source load of nitrogen despite only making up 1.3% of the catchment[53]

#### *2.3.2.2 Other contaminants*

117. The sources of faecal contamination are identified in the evidence of Dr Davies-Colley[54] as being largely from non-point sources. The sources of faecal contamination from farms are identified in the evidence of Dr Monaghan[55] and Dr Houlbrooke[56]. Sediment is another contaminant of water bodies that has been identified as being from predominantly non-point sources, specifically from erosion of soil. The evidence of Roger Parfitt[57], and Associate Professor Death[58] discuss the sources of sediment and impacts on waterbodies and their values.

118. I have summarised the various non-point farming sources of the different types of contaminants in **Error! Reference source not found.**

119. Evidence of Dr Clothier [59] et al (2007), Dr Monaghan [60] (2009), Dr Houlbrooke[61] (2009), Dr MacKay[62] (2009), Dr Dewes[63] (2012), and Associate

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[51] Record of Technical conferencing on LUC/Best practice sub-topic in relation to surface water quality – non-point source discharges held on 23rd March 2012. Addressing Point 7.
[52] Ms Dewes EIC paragraphs 5.12 – 5.38
[53] Roygard, L., & Clark, M. Supplementary Statement, paragraph 80 - 89
[54] Dr Davies Colley (2009) S42a Report, paragraphs 55 and 56
[55] Dr Monaghan s42 officers report, paragraph 12, 13ii, 13iii, 13vi, 13vii, and Figure 1 page 10
[56] Dr Houlbrooke s42a officers report
[57] Dr Parfitt s42a officers report
[58] Associate Professor Death EIC paragraphs 39 - 53
[59] Clothier, B., MacKay, A., Carran, A., Gray, R., Parfit, R., Francis, G., Manning, M., Duerer, M., & Green, S. (2007) Farm Strategies for Contaminant Management – A report by SLUI, the Sustainable Land Use Research Initiative, for Horizons Regional Council, Table 10, and Table 11
[60] Dr Monoghan s42a officers report, Table 1, page 14
[61] Dr Houlbrooke s42a officers report
[62] Dr MacKay s42a officers report supplementary evidence

Professor Death[64] (2012) has identified the practices required to minimise the losses of these contaminants from productive land uses. I have also summarised these in Appendix 4. In order to achieve and implement the goal of the 'framework provisions' of the POP to maintain and improve water quality, these sources of contaminants should be addressed in some way by the regional plan. I have also assessed which the parts of the DV POP currently address these contaminant sources and their mitigation, and which remain to be addressed by the non-point source provisions.

120. In summary the evidence shows that:

a. sources of **sediment** losses are dealt with appropriately by the provisions of Chapter 5 and 12 which address soil erosion off land (other than riverbanks or from farm tracks). Sediment losses from riverbanks exacerbated by stock access to those river banks needs to be addressed by non-point source provisions along with preventing direct discharges from farm tracks.
b. Sources of **faecal contamination** are managed in part by controls on discharges of collected effluent in Chapter 13. Losses of faecal contamination by direct stock access to water needs to be addressed by non-point source provisions along with runoff from farm tracks.
c. Losses of **phosphorous** to water are largely addressed by provisions which manage erosion and fertiliser and effluent applications.
d. Losses of **nitrogen** from land use are not adequately addressed by only controlling fertiliser and effluent discharges and require more comprehensive nutrient management measures and need to be addressed by non-point source provisions.

121. Therefore, in my opinion, in order to achieve the objectives of the POP to maintain and improve water quality and to ensure that all sources of non-point pollution are appropriately managed, the Plan needs to address stock exclusion from waterbodies, runoff from farm tracks (including bridges), and nutrient management to control losses of nitrogen, and phosphorus. Existing provisions managing effluent and fertiliser and other applied sources of nutrients need to be

[63] Dr Dewes EIC,
[64] Associate Professor Death EIC, paragraphs 88 - 93

retained, and appropriately referenced and/or included in the non-point source regime.

#### *2.3.2.3 Intensive land uses*

122. At a minimum, I consider that the recognised 'intensive' land uses (market gardening, cropping, dairy farming and intensive sheep and beef farming) should be included for control in any non-point source regime.

123. The NV POP included all these land uses in the regulatory regime of Rule 13-1. All except dairy farming were removed in the DV POP. Ms Barton summarises the hearing panel's reasons for not including cropping, market gardening, and intensive sheep and beef farming in the regime for regulating intensive farming activities and instead relying on non-regulatory methods. She does not state if she agrees with the hearing panel's reasons or their decision to exclude them, but has continued to exclude these land uses from the rule. I do not agree with the hearing panels reasons for excluding these land uses from the regulatory regime.

124. The hearing panel raised three main issues:

a. Lack of evidence of N leaching;
b. Problems involved with regulating transient land uses; and
c. Small proportion of these land uses in some catchments.

125. **Lack of evidence of N leaching** I have set out in section 2.3.2.1 above the evidential basis showing the high risk of pollution resulting from these land uses.

126. **Problems involved with regulating transient land uses.** I consider that problems involved with regulating transient land uses have been overstated. I accept that cropping and some types of market gardening occupy different areas of land each year or each growing season, or are undertaken for a year or two on a property and then not undertaken again for a number of years. This would mean that a resource consent for a different property or area of land would need to be sought each year, or a resource consent sought for a property, and not be required again for some years. I recognise that this will impose a regulatory cost for these types of land uses. However, it is not technically or practically impossible to apply the resource consent process in these circumstances and I

do not believe it is an overwhelming reason to exclude these land uses from the requirement to seek a resource consent.

127. The resource consent process is relatively straight forward – a nutrient management plan must be prepared and submitted, the resource consent is not notified, and provided the standards and terms are met, as a controlled activity the consent must be granted. Mr Taylor[65] provides evidence on resource consents process for DV rule 13.1B (9 applications have been made and all have been granted) and describes a relatively straight forward process as follows; (1) a one on one consultation was undertaken between himself and the farmer and/or farm consultant, (2) LUC farm map was prepared to determine N allowance for the farm, (3) Nutrient management plan was prepared, (4) application was made, (5) draft consent conditions were drawn up for consultation with the farmer/ farm consultant, (6) consent granted. For these land uses (cropping and market gardening) many of the other conditions and terms are not relevant (such as discharge of animal effluent, and stock exclusion from waterbodies).

128. For a farms occasionally engaged in cropping, a resource consent can be sought which identifies the 'worst case scenario' for cropping while still complying with nitrogen leaching allowances across the property. This will allow flexibility without having to seek further resource consents or variations to consents. This would be the same process as for the current provisions governing new dairy farming, in the manner set out in paragraph 105(c) an 106 of Ms Barton evidence.

129. For transient land uses, such as vegetable growing, a resource consent will need to be sought for each year. It is possible this could be gained in advance. I accept there will be a cost involved gaining this consent. But I consider it a reasonable cost and a necessary one in order to achieve nutrient management planning and reduce nitrogen leaching across a catchment.

130. Ms Barton proposes a 'policy solution' for these other land uses. The policy she proposes (Policy 6-7B) does not address the identified pollution from these sources, it simply proposes monitoring of them. Monitoring of a land use does

[65] Mr Taylor EIC, paragraph 16 and 19.

not help to achieve the maintenance or enhancement of water quality. I acknowledge that the policy also identifies that these land uses may be included in a regulatory regime in the future, however, that will require a change to the regional plan, a process which takes some considerable amount of time. In the interim, I assume Ms Barton intends to rely on non-regulatory methods to manage pollution from these land uses, in the same way that the hearing panel did.

131. I am not aware of any non-regulatory methods included in the plan which address pollution losses from these land use types. I am also not aware of any significant industry initiatives at work in or proposed for the region which are shown to have actually, in particular, reduced nitrogen losses from these farms. In fact, the evidence of Dr Marsh[66] describes that broadscale adoption of management practices sufficient to improve water quality is unlikely.

**132.** Small **proportion of these land uses in catchments.** The technical evidence[67] [68] indicates that the proportion of land in a catchment identified as being used for, in particular, horticulture and cropping, is often underreported, due in part to the transitory nature of the activity. The actual percentage of the catchment taken up by these land uses will vary over time and may in fact be higher than that recorded. In addition, the technical evidence further shows that despite a relatively small proportion of a catchment being taken up with these land uses, because of their relatively high rates of leaching, the contribution of these land uses to the total nitrogen measured in waterbodies is actually high.

133. I am also concerned about 'regulatory flight'. If only osme intensive farming uses are regulated, that may provide an incentive for land owners to move from a regulated land use to an unregulated land use to avoid that regulation. Other intensive land uses that were unregulated in the DV POP are known to have nitrogen leaching rates at least as high as dairy farming. In particular dairy support and growing of crops for dairy support is considered reasonably likely to expand in the region (as described in Dr Dewes evidence in chief). If these other land use activities increase because they are not regulated, there is likely to be

[66] Marsh EIC paragraph 125 - 128
[67] Dr Dewes EIC paragraphs 5.12 – 5.38
[68] Roygard, J., & Clark, M. Supplementary statement, paragraph 140 - 142

an increase in leaching in these sub-zones, and a corresponding decrease in water quality, and corresponding declines in aquatic ecosystem health or life supporting capacity

134. I therefore consider the risk of not acting to include these land uses in the regulatory regime is high. If these land uses are not controlled, levels of contaminants in surface water are likely to increase. This will reduce water quality and move the region further away from achieving the communities water Values. This will not achieve the objectives of the plan.

135. I recognise that all land use activities contribute to the non-point source pollution I have identified above, but I note the agreed position of the best management experts[69] that there are fewer opportunities to reduce nitrogen loss from extensive sheep and beef farms. Land use activities that are currently considered 'non intensive' for loss of the key contaminants should at a minimum continue to be monitored to ensure they remain low risk, and to be included in an expanded regulatory management regime at a later date if necessary. I discuss in more detail later in my evidence appropriate provisions (regulatory and non-regulatory) for this management approach.

### 2.3.3 For each land use, what changes can be made to help achieve the objective?

136. Land management practices to reduce faecal, sediment and phosphorus losses are readily identifiable and are largely included in provisions in the plan. The exception to this is stock access to water which I will discuss further in section 2.3.5.

137. Nitrogen mitigation measures are also well known. Several pieces of evidence identify these and a useful summary is included in Appendix 4.

[69] Record of Technical conferencing on LUC/Best practice sub-topic in relation to surface water quality – non-point source discharges held on 23rd March 2012. Addressing Point 7.

#### *2.3.3.1 How much reduction in nitrogen leaching is possible?*

138. Dr Clothier et al[70] gathered information on best management practices around the country and concluded that a reduction in nitrogen leaching reductions of about 1/3 is possible on dairy farms using currently available technology. This analysis is based on information gathered from around the country and aligns well with industry targets for reductions. Evidence provided by Dr Dewes[71] summarising current research and her own experiences concludes that nitrogen leaching reductions of up to 30% - 40% are possible while still maintaining or improving farm profitability.

#### *2.3.3.2 Industry goals for reductions*

139. The farming industry has several goals relating to reductions in nitrogen loss from farms.

140. The Dairy Industry Strategy for Sustainable Environmental Management (Report of the Dairy Environment Review Group, March 2006) contained a 'stretch' target that water pollution would be reduced by 30% in key catchments by 2010. Key catchments were defined by the Strategy as catchments where the relevant regional plan goals for water quality are not being met by a significant margin or where there is a risk of regulation being introduced. The catchments targeted by rule 13-1 would meet this definition of key catchments.

141. This goal is repeated in the dairy sector commitment in the Primary Sector Water Partnership Leadership Document with a revised timeframe of 2016, with a definition of 'at risk' catchments to be identified by November 2008.

#### *2.3.3.3 How much do these reductions cost?*

142. Evidence identifies that reductions of up to 30% of nitrogen leached can be made at moderate cost. I do note that actual costs will vary from farm to farm as set out in the statement of caucusing for LUC/Best Practice experts[72] who

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[70] Clothier, B., MacKay, A., Carran, A., Gray, R., Parfit, R., Francis, G., Manning, M., Duerer, M., & Green, S. (2007) Farm Strategies for Contaminant Management – A report by SLUI, the Sustainable Land Use Research Initiative, for Horizons Regional Council, page 21 and 27

[71] Dr Dewes EIC paragraph 7.16, 9.2, 9.16, 9.28, and Table 2

[72] Record of Technical conferencing on LUC/Best practice sub-topic in relation to surface water quality – non-point source discharges held on 23rd March 2012. Addressing Point 19.

agreed that costs are hugely variable and farm specific and depend on the magnitude of reduction in nitrogen loss required.

143. As stated above the evidence of Dr Dewes[73] concludes that reductions of between 10% to 40% are possible while maintaining or improving farm profitability, however, for nitrogen leaching reductions at the higher end of the scale a case by case assessment needs to be undertaken and farm systems modelling is recommended. In discussing profitability, Dr Dewes states that (paragraph 7.1) "*in most cases, when one is faced with assessing a farm system for lowering nitrogenous losses, a strategy can be designed to achieve more profit, productivity and resilience without long term adverse effects to the business*". Research by Dr Scarsbrook for DairyNZ has shown that "*an average Waikato Dairy Farm can reduce urinary N by up to 40% and increase profit by $700/ha (25%) suggesting that environmentally friendly productivity gains are to be had*"[74]. Dr Marsh concludes reductions in nitrogen leaching can be achieved with moderate costs only, and gives a range of $25 - $62 per hectare for a 20% or 30% reduction in nitrogen leached or a 4% reduction in profit[75].

144. I discuss relative costs of nitrogen reduction options in more detail in the following section.

### 2.3.4 An appropriate nitrogen loss limit

145. The NV POP applied nitrogen loss targets in Table 13.2 to new and existing regulated intensive land uses according to the LUC Class of the land, with nitrogen loss targets reducing over a 20 year time period. The DV POP replaced Table 13.2 with a different set of LUC based nitrogen loss targets, with no reduction applied over time, and the nitrogen loss targets only applying to new dairy farming. The targets in DV POP Table 13.2 do not apply to existing dairy farms that require resource consent, instead these farms are subject to a requirement to implement 'reasonably practicable farm management practices to minimise' nitrogen losses.

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[73] Dr Dewes EIC, paragraph 9.28, Table 2
[74] Reproduced in Dr Dewes EIC paragraph 7.16
[75] Marsh EIC paragraphs 44 and 123

146. The objective of the One Plan is to maintain and enhance (where necessary) water quality to move towards the Schedule D limits and therefore advance the achievement of the Schedule AB values. In this respect the RPS policies of the POP take a strongly integrated catchment management approach. That is, that all activities (including point source discharges and non-point source discharges) contributing to water quality in a catchment should be managed to achieve water quality goals for that catchment. Therefore, any approach to managing non-point source contributions of N should:

a) consider all the non-point sources of N in the catchment; and
b) manage all those sources appropriately towards achieving the catchment goals.

147. I note that a whole of catchment approach was agreed as appropriate by the experts involved in the LUC/Best practice conferencing[76].

148. I also acknowledge that any management regime which requires changes in land use management needs to be pragmatic and acknowledge the technical and financial constraints I have discussed in sections 2.3.3.1 and 2.3.3.3 above.

149. I am not going to address all possible tools for setting an appropriate nitrogen loss limit. Section 32 requires an assessment of options and to identify the *most appropriate of the options.* I have limited my assessment to the options that are contained within the scope of appeals. My understanding of the options within the scope of appeals is:

a) The DV POP (adoption of 'reasonably practicable' farm management practices for existing farms in target catchments and N loss limits by LUC class for all new farms, and now supported by in the evidence of Federated Farmers).
b) The NV POP (N loss limits that reduce over a 20 year time period, set by LUC class for all new farms and for existing farms in target catchments, as sought in the appeals of MOC and WFGC).

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[76] Record of Technical conferencing on LUC/Best practice sub-topic in relation to surface water quality – non-point source discharges held on 23rd March 2012. Addressing Point 9.

c) An option between a) and b) above (for example the proposal put forward by Horizons in the evidence of Ms Barton to manage both new and existing dairy farms according to N loss limit set by LUC, but not reducing over a 20 year period).
d) A single number N loss cap, (as proposed in the appeal of Federated Farmers and put forward in the evidence of Fonterra as 27kg/N/ha/yr).

#### *2.3.4.1Section 32 Analysis of the nitrogen limit options*

### *Economic costs and benefits*

150. My understanding of section 32 of the Act is that an evaluation is required to examine whether the policies, rules and other methods are the most appropriate for achieving the objectives (s32(3)(a)). Section 32(4)(a) states that for the purposes of this examination, the benefits and costs of policies, rules or other methods must be taken into account. The costs and benefits are not limited to economic costs and benefits, but examination of economic costs and benefits can be of assistance.

151. I understand from the evidence that all of the proposed N loss limits are achievable on farm at a reasonable cost (see my sections 2.3.3.3 above). There is only a detailed cost analysis for the NV POP[77]; I have not seen any cost assessments for the other options in the evidence of the economics experts. I understand, from the evidence of Dr Marsh[78], that the cost assessment for the NV POP has some limitations, and in particular is likely to have over estimated the costs and underestimated the benefits.

152. The Act does not specify the detail to which the costs and benefits must be analysed, although I would suggest that the examination needs to be of sufficient detail to enable a balanced conclusion to be drawn. Dr Marsh also explains in his evidence[79] that accurate economic analysis of costs and benefits at farm level requires modelling that requires a level of regional data that is generally not available in New Zealand. Dr Marsh's evidence suggests to me that constraints

[77] Neild and Rhodes s42a officers report
[78] Dr Marsh EIC evidence paragraph 9
[79] Marsh EIC paragraphs 36 and 37,

on detailed economic analysis of policy effects across the Region means that economic cost benefit analysis needs to be done at a broader level simply because the data and modelling is not available for more complex analysis.

153. During expert conferencing, the economics experts did not reach a consensus on the exact magnitude of benefits and costs likely to occur with any of the options, but did reach some conclusions about the *relative* benefits, costs and effectiveness of the various options[80].

154. This approach did not establish a dollar net cost to each option, but instead considers what the cost of the various options are relative to the others, effectively ranking the options. For the purposes of an evaluation under s32, I consider that this approach is appropriate. An evaluation as to whether the selected policies, rules and methods are the most appropriate generally requires a comparison - to identify the most appropriate out of those options available. In my view, in the absence of specific costs it is equally appropriate to make a comparative analysis of the options. I also believe that this comparative approach is useful when considering costs and benefits that are not readily evaluated in economic terms, for example environmental costs and benefits. Thus, a comparative approach allows for the costs and benefits across social, cultural, economic and environmental wellbeing, as set out in section 5 of the Act.

155. For these reasons, I have not been able to reach a definitive conclusions about the *specific* economic benefits and costs of each option. However, I have been able to reach conclusions about the *relative* benefits and costs, based on the outcomes of the economics expert conferencing and I have summarised them in Table 1 below.

[80] They also did not reach a conclusion about the relative efficiency of the options, so I have not been able to consider that in my analysis.

**Table 1: Summary of agreed benefits, costs, efficiency and effectiveness rankings following economics caucusing**

| **Regime** | **Costs** [81] **(relative to NV POP) (estimate of $1.8 - $4.4 million for NV POP)** | **Benefits (ranking)** [82] **(estimate of 6-$26 million for highest ranking option)** | **Benefit/cost ratio** [83] **(ranking)** | **Effectiveness** [84] **(at leading to water quality improvements)** |
|---|---|---|---|---|
| WFGC (NV POP) | Broadly Similar | 1 | 1[85] | 1 |
| HRC | Lower than WFGC | 2 | 1 | 2 |
| Fonterra (27kg/N/yr) | Lower that WFGC | 3 | 2 | 3 (may not be effective) |
| Federated Farmers (DV POP) | Unknown | 3 | 2 | Not able to be measured[86] (may not be effective) |

### *Environmental benefits and costs and effectiveness*

156. A key measure of the effectiveness of each of the nitrogen loss limit approaches is the progress each approach will make at achieving and implementing the objectives and policies of the plan. I have identified above what I consider to be the 'framework provisions' of the RPS. Of particular

[81] Question 3

[82] Question 4

[83] Question 9 (not agreed by Mr Ballingall)

[84] Question 9 (not agreed by Mr Ballingall)

[85] Dr Marsh considers WFGC option will have the highest benefit/cost ratio

[86] Question 8

relevance to this question is the enhancement of water quality – the goal of the framework provisions to maintain water quality is not relevant in the water management sub-zones identified for management of non-point source pollution, but rather the goal is to improve it towards achieving the Schedule AB Values and Schedule D water quality limits).

157. The environmental benefits of some of the options are set out in the evidence in Chief of Dr Roygard et al, Dr Ausseil, Dr Dewes, and Associate Professor Death. These are modelled in the evidence of Dr Ausseil and Dr Roygard. The evidence is complex, but is helpfully summarised and agreed to by all experts at the expert conferencing[87]. The experts agree, that of the scenarios modelled, the NV POP year 20 numbers will lead to the greatest reduction in nitrogen pollution in the targeted catchments.

158. By way of example, the modelling of Dr Ausseil shows that the application of the NV year 20 LUC limits is the best approach at both maintaining and reducing nitrogen loads, under a number of different scenarios. Comparing the DV POP nitrogen leaching maximums against the NV POP year 20 maximums for the Mangatainoka catchment under current land use, which result in improvements (decreases) in river nitrogen loadings from 5.9% to 23% respectively[88]. These correspond to improvements (reductions) in periphyton biomass of 3% (DV POP year 1 nitrogen leaching maximums) to 30% (NV POP year 20 maximums)[89]. (Dr Ausseil, 2012, Table 19).

159. Based on this evidence, I consider that the NV POP approach (with year 20 nitrogen leaching maximums) will be the most effective option at achieving the objective and implementing the policies.

160. I have also taken into account the risk of not acting. If no management action is taken to reduce nitrogen pollution entering waterbodies in the identified catchments as shown by table 41 evidence of Dr Roygard *et al*, nitrogen loadings in-river increase (up to 10% in some catchments) causing water quality to deteriorate. These scenarios only considered an 11% intensification of dairy

[87] Record of Technical Conferencing on Nitrogen Limits and Water Quality sub-topic in relation to surface water quality – non point source discharges (29 March 2012) question 2
[88] Dr Ausseil (2012) EIC Table 19
[89] Dr Ausseil EIC Table 19

farming. If a higher rate of intensification occurs, or leaching increases from land uses other than dairy farming, this modelling will underestimate increases in nitrogen leaching in the absence of regulation, and the actual situation will be worse than that modelled.

### *2.3.4.2 Conclusions*

161. My conclusions, based on the information above is summarised in the following paragraphs.

162. The **DV POP 'reasonably practicable farm management practices' will not maintain or enhance water quality.** This is because the approach does not incorporate a catchment cap. It only considers the individual farm level. As more dairy farms come into a catchment (through conversion of non-dairy land) and as existing farms intensify (while still applying BMP's), overall N leaching in the catchment will increase. Further, even for an existing farm, evidence suggests[90] that this type of regulation will be ineffective at reducing N losses, as farmers will simply seek to demonstrate that any measure that increases costs is not 'practicable'. This will not achieve the objectives of the POP. Because of this, this option is also likely to have the lowest economic benefits (based on the benefits of improved water quality) and a lower benefit/cost ratio than the other options.

163. The **NV POP approach will lead to the maintenance or enhancement of water quality.** This maintenance or enhancement will occur even if intensification and conversion scenarios are greater than that predicted at present. In my view, this is an important consideration. Regulation of one or more types of intensive land use, may lead to people moving from the regulated land use to an unregulated or less regulated land use to avoid the regulation[91]. This needs to be taken into account when considering the outcomes of regulation. In this case it may mean that landowners choose to intensify their sheep and beef farming operations, without adding irrigation, instead of converting to dairy farming or some other regulated intensive farming activity.

[90] Dr Marsh EIC paragraph 127

[91] This risk is identified in the record of caucusing of LUC/Best practice experts (question 7) and in the evidence of Dr Marsh, paragraph 37, and Dr Dewes paragraphs 5.1 – 5.38

This is considered reasonably likely by Dr Dewes as outlined in her evidence[92]. This approach achieves the framework provisions goal of enhancement of degraded waterbodies. This option has the highest economic (as well as environmental) benefits and a high cost benefit ratio (equal to that of the HRC approach).

164. The **LUC approach recommended by Ms Barton may maintain water quality, but only in some situations, and it is unlikely to improve water quality,** as such it will not achieve the objective of maintaining and enhancing degraded water quality**.** If any of the assumptions used in the modelling are inaccurate, for example if the leaching of extensive sheep and beef farms moves from 10kgN/ha/yr to 12kgN/ha/yr or greater, as set out as reasonably likely in the evidence of Dr Dewes, and modelled by Dr Ausseil, the approach being currently proposed by the regional council will not maintain water quality. This option has slightly lower costs than the NV POP approach, but also lower benefits in regards to water quality improvements.

**165. A single N loss cap number <u>may</u> maintain water quality, if it is set at lower than 24/kg/n/yr.** However, this is based on current assumptions about growth in dairy and intensification of other land uses. As discussed above, there is reasonable uncertainty about these assumptions, and growth and intensification may be higher than currently predicted. If this occurs, water quality outcomes will be worse than predicted, and **water quality may decline under this management approach.** An N loss approach that merely maintains water quality will mean that the plan will not effectively address the water quality issues in these catchments. This approach has lower cost, and also lower benefits then the NV POP or HRC approach.

166. In my view, the DV and single N cap approaches are <u>inappropriate</u>, as they do not have a reasonable likelihood of achieving the objectives and implementing the policies of the POP relating to water quality. As outlined in Ms Sweetman's evidence, approaches that will not improve water quaity will also not give effect to the NPSFM.

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[92] Dr Dewes EIC EIC, 2012, paragraphs 5.1 to 5.38

167. The LUC approach recommended by Ms Barton for Horizons is appropriate, insofar as it may maintain water quality and, if the modelled assumptions prove to be correct, it may lead to a water quality improvement.

168. However, I consider that the NV POP approach is more appropriate than that recommended by Ms Barton. It has a higher likelihood of success, even in a worst case intensification scenario. The risks associated with the modelling, (ie that unregulated land uses will intensify) are ameliorated by taking this into account in setting nitrogen loss limits. Costs under this option will be higher than the Horizons approach, but will still be reasonable both at a farm level, at the regional or national economic level, and when compared to the economic benefits of improved water quality.

### 2.3.5 Stock access to waterbodies

169. Stock exclusion from waterbodies has been identified as a key best management practice for minimising the loss of sediment, phosphorus, and faecal contamination[93] from farms to water. I agree with Ms Barton that this is a necessary component of the non-point source regime. However, I disagree with Ms Barton's assessment as to the appropriate application of a rule controlling stock exclusion and the scope for its inclusion.

170. The NV POP included requirements for all regulated land uses in target catchments and new regulated land uses, to exclude stock from streams[94]. That standard was included by requiring compliance with all the appropriate parts of the FARM Strategy Workbook. The FARM Strategy Workbook included several components of Module 4 relating to management of stock access to water, including physically preventing stock from entering waterways 'wider than a stride and deeper than a redband gumboot', and stock crossings being bridged or culverted.

171. The DV POP incorporated stock access and stock crossing requirements into Rules 13-1, 13-1A and 13-1B themselves (instead of by reference to the FARM

[93] My understanding on this differs from Ms Bartons at her paragraph 147, who states the benefits of stock exclusion in relation to nitrogen only.
[94] My analysis of this differs from Ms Bartons at her paragraph 146 and her analysis beginning para 150. It is my understanding that stock exclusion was a requirement of the NV POP as I have outlined, and was reduced, not introduced by the hearing panel.

Strategy), and as a consequence of reducing the application of the rules (to fewer land uses and fewer water management sub-zones) reduced this requirement to only apply to new dairy farming and dairy farming in target catchments.

172. WFGC and the MOC seek to have restrictions relating to stock access included in the form they were in the NV POP[95]. To grant this relief, the plan would need to be amended to include rules which restrict the access of stock to water where they are on any intensive farm which is either new, or located in any of the originally notified target catchments. I have included wording for a rule to control stock access to waterbodies, in the same way that the DV POP does, but expanding that control to all the intensive land uses that involve stock, and to include all of the originally notified catchments.

173. I note that the rule framework that I recommend is essentially the same as that largely agreed by the parties to the appeals in their memorandum of 28 October 2011[96].

### 2.3.6 Conclusions on key issues

174. In order to achieve the objective and implement the objectives and policies expressed in the RPS, the RPS and RP need to address the following in a regime for non-point source pollution:

A. Manage non-point source pollution in the following catchments:

[95] My analysis of this differs from Ms Bartons, who considers at paragraph 145 that the appeals of WFGC and MOC seek a general stock exclusion rule for the whole region

[96] Memorandum regarding implementing the mediation agreement concerning regulation of dairy farming (and other provisions relevant to water quality) in memorandum dated 12 July 2011 and a memorandum dated 13 July 2011 regarding Policy 6-7.

- Mangapapa Mana_9b
- Upper Mangatainoka Mana_8a
- Middle Mangatainoka Mana_8b
- Lower Mangatainoka Mana_8c
- Makakahi Mana_8d
- 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
- Hopelands-Tiraumea Mana_6
- Upper Gorge Mana_9a
- Mangaatua Mana_9c
- Coastal Rangitikei Rang_4
- Lake Horowhenua Hoki_1a
- Hokio Hoki_1b
- Waikawa West_9a
- Waikawa West_9b
- Lake Papaitonga West_8
- Northern Manawatu Lakes West_6
- Kaitoke Lakes West_4
- Wanganui Lakes West_5

B. Manage the following contaminants:
    (i) Sediment
    (ii) Phosphorus
    (iii) Nitrogen
    (iv) Faecal

C. Manage the following intensive land uses:
    (i) Dairy farming
    (ii) Intensive sheep and beef farming
    (iii) Horticulture
    (iv) Cropping

D. Manage or at a minimum continue to monitor other land uses including extensive land uses.

E. Ensure that best management practices for minimisation of faecal, sediment and phosphorus contamination are instituted on those intensive land uses, including reducing nitrogen leaching and excluding stock from waterbodies.

F. Require intensive land uses to manage their N leaching to ensure they do not exceed a maximum defined in the plan. The most appropriate N leaching maximum option on the table is that contained in the NV POP.

I will assess the provisions of POP against these factors in the following section.

### 2.3.7 Provisions of the POP

175. In this section of my evidence I will assess the provisions of the POP relating to non-point source pollution. I will assess these provisions against the statutory tests I have identified in section 2.1.1 above.

176. In particular, I assess the provisions of Chapter 6 to find which provisions will most appropriately achieve the objectives and implement the 'framework provisions' I have identified in section 2.2.2 above.

177. In addition to the section 32 test, I assess the provisions in Chapter 13 to find which provisions will most appropriately give effect to the provisions in the RPS. I apply the 'give effect to' test for the two reasons set out in my section 2.1.7 above. In summary, these reasons are that, I consider that the level of regard that should be had to the RPS when assessing the regional plan is as high as to give effect to it, and secondly that Objective 11A-1 requires the Regional Plan to *give effect to* the provision of the RPS.

178. I also refer to the conclusions on the key issues I have made above applying these same statutory tests.

#### *2.3.7.1 Section 6.1.4*

179. Ms Barton proposes some changes to the section on water quality in the Scope and Background introduction to the Chapter (Section 6.1.4). She does not discuss the reasons for the proposed changes, however, they appear to be

to clarify the paragraph to be consistent with changes she proposes to the policy framework. I support these changes.

#### *2.3.7.2 Policy 6-7*

180. The various versions of Policy 6-7 are set out in my Appendix 1. The appeals of MOC and WFGC seek for this Policy to be amended to reflect the NV.

181. Policy 6-7 is the first policy in the RPS of the POP that deals specifically with land use activities that affect water quality. It sits in section 6.4.2.3 of the POP which deals with the management of both non-point source and point source discharges of contaminants to land and water and implements the higher level water quality 'framework provisions' I have set out in my section 2.2.2 above.

182. In the scheme of the RPS provisions of the POP, Policy 6-7 'should' be the policy which identifies how land use activities that affect water quality will be managed. The other policies in this section are concerned with 'management', not just regulation.

183. The DV POP narrowed the framework for managing non-point source contaminants set out in the NV POP. In my view, the decision gives no clear rationalisation for restricting the application of Policy 6-7 to the WMZ and landuses the hearing panel decided to regulate. Ms Barton has essentially adopted the changes of the DV POP, but expanded the application of nitrogen loss limits to existing dairy farms, and added more detail about what those nitrogen loss limits will be.

184. However, in my opinion, this policy in the RPS should set the overall strategy for management of non-point source pollution in the Region. It should not just deal with the particular areas and activities to be regulated. I have recommended amendments to direct the policy to:

a. Identify at risk catchments;
b. Identify high risk land uses for loss of contaminants (intensive farming);
c. Require high risk land uses to manage contaminant losses;
d. Identify achievable limits and management practices to achieve reductions in contaminant loss; and

e. Monitor other land uses and catchments and change their status as necessary.

185. Both the DV POP Policy 6-7 and the version recommended in Ms Barton's evidence go into a high level of detail as to the method of allocation and rate of nitrogen leaching reduction required. I consider that it is more appropriate for this to be dealt with in the regional plan policies, rather than in the RPS. In this regard, I note the decision of the hearing panel where (in relation to some other water management related policies) they moved some highly detailed matters of policy from the RPS to the RP as part of their decision. I agree this is appropriate, and my recommended wording for policy 6-7 in the RPS reflects this.

186. I have also not been as specific about the water management sub-zones and land uses as Ms Barton. This is because I consider it is more appropriate for policies at the RPS level to set the direction, rather than be as specific as to identify particular land uses and sub-zones. This approach has two main benefits. First, it allows the response of the regional council to be more flexible, the focus of monitoring can change in response to changing information and trends, rather than being limited to what has been identified today. Second, if more information shows that additional sub-zones or land uses need to be incorporated into the regulatory regime, a further change is not required to the RPS for the change to occur. For example, if further information found that land use activities in the Mangawhero water management sub-zone required regulation, this would be included in the Regional Plan, consequently Policy 6-7B would require changing to remove Mangawhero from the list of monitored catchments for this purpose. This makes administration of the plan and RPS more efficient and should be adopted.

#### *2.3.7.3 Policy 6-7A and 6-7B*

187. Ms Barton recommends two new policies (Policy 6-7A and Policy 6-7B) to identify which land uses and which catchments will be a particular focus for monitoring and identifies that they may be included in the regulatory regime in the future. I support the intent of these policies. I have, however, incorporated the concepts reflected in them in my recommended Policy 6-7 discussed above.

#### *2.3.7.4 Non-regulatory methods*

188. Ms Barton recommends two additional methods (Method 6-6A and 6-6B)[97]. Ongoing monitoring of the water quality of coastal lakes, and active management of Lake Horowhenua and other lakes is appropriate. I support these methods, with appropriate amendments to reflect the policy framework I have set out above.

#### *2.3.7.5 Objective 13-1*

189. Objective 13-1 is the only objective in Chapter 13. The various versions of Objective 13-1 are set out in my Appendix 1.

190. In the recent update to her evidence [98], Ms Barton recommends the MV POP objective. This Objective is not agreed by all parties[99]. I agree the MV POP wording objective more appropriate for reasons I explain in the following paragraphs.

191. In my opinion, the MV POP objective is more appropriate than the DV POP. In particular, reference to safeguarding life supporting capacity and advancing the achievement of the Values (rather than having regard to them) is appropriate for the reasons I have set out in relation to Objective 6-1 in section 2.2.2.1 above. I also consider that in clause (b) *providing for* the objectives and policies of Chapter 6 is more appropriate than having regard to them. This is because of the requirement (in Objective 11A-1) for regulation in the RP to give effect to the RPS – it is not certain that the objectives and policies of the RPS will be *given effect to* if decision makers only have *regard to* them.

192. I note here that the application of Objective 13-1 to the policies and rules that follow relating to non-point source pollution is limited to those parts of the regime that are clearly identified as discharges (eg fertiliser, effluent). Rule 13-1 regulates farming as a mixture of land use and discharges. The DV POP of Chapter 13 has no objective relating to the land use component of this issue. The only objective in the RP relevant to the land use component is Objective

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[97] Ms Barton EIC paragraph 157(b)(ii)
[98] Memorandum – Erratum to statement of evidence of Clare Barton on the topic of surface water quality – non-poin source discharges on behalf of Manawatu-Wanganui Reigonal Council (Attachment 1 and Attachement 2) Dated 28 March 2012.
[99] Fonterra and Federated Farmers reserved their position

11A-1, which requires the plan to regulate activities to maximise certainty, and to give effect to the RPS.

193. I have considered whether it would be appropriate to construct a new objective or to expand the application of Objective 13-1, or to continue to rely on Objective 11A-1 to address the landuse component.

On balance, I consider it would be more effective to include a specific Objective in Chapter 13, partly because the objective in Chapter 11A is relatively 'hidden' and is not specific to the goals relating to water quality.

194. Given the management of land use is to achieve water quality goals (as identified in Policy 6-7), and the goals are clearly set out in Chapter 6, I consider that expanding Objective 13-1 to cover the effects of land use activities on water quality is appropriate. This can be achieved by altering the title and introductory clause of objective 13-1 in the manner I have set out in my Appendix 2.

#### *2.3.7.6 Policy 13-2C*

195. The DV POP Chapter 13 contains one policy to guide decision making on resource consents for land uses that affect water quality. It contains no policy on how those activities will be regulated.

196. I have recommended wording in Appendix 2 for two new policies. These are very similar in intent to those recommended by Ms Barton. However, I have reworded the policies to provide a better cascade from and connection to my recommended Policy 6-7 in the RPS.

197. In particular, I agree with Ms Barton that it is appropriate to provide policy guidance for decision makers considering applications under the restricted discretionary rules for landuses that do not meet the conditions of a controlled activity. In particular, it is appropriate to provide an exception or policy pathway for those small minority of properties that, because of their location, will find it difficult to meet the nitrogen loss maximums that are achievable elsewhere.

198. The wording I have recommended is narrower than that of Ms Barton in two areas. First, it is limited to providing exceptions to nitrogen leaching maximums for existing farms. While existing farms were established legally and with no expectation of future regulation, the same does not apply for new land uses.

Decisions to establish new land uses will be made in full knowledge of the regulations in place. I do not think it is appropriate for new intensive farming activities to be provided with an exception to regulatory requirements.

199. Ms Barton has recommended the addition of sub-clauses (g) and (h)[100] to guide reasonably practicable farm management practices to be considered when assessing a restricted discretionary activity. I have not adopted these because I do not think it is necessary to refer to reasonably practicable farm management practices in the default rule, and so there is no need to provide guidance on what it means in the policy. I also consider that while the list is a good reflection of current farm management practices for minimising nutrient leaching etc, as more technologies become available this list will become out of date. I think this type of guidance would be better provided in guidance outside the plan.

#### *2.3.7.7 Table 13.1*

200. Table 13.1 identifies the water management sub-zones where existing land use activities will be regulated.

201. Ms Barton also proposes that Table 13.1 identify the year in which Rule 13-1 becomes operative. I consider this is a pragmatic method to stage the introduction of the rule and allow for its effective and efficient administration and I support Ms Barton's amendments in this regard.

202. Ms Barton has supported the retention of the Northern Manawatu Lakes and Manawatu above the Gorge sub-zones within the regulatory regime for existing land uses. I agree with Ms Bartons assessment[101] in this regard.

203. WFGC and the MOC sought the inclusion of several subzones in Table 13.1 which were included in the NV POP but excluded from the DV POP. These additions are not supported by Ms Barton in her evidence.

204. I have identified the water management sub-zones where management of non-point source pollution is a major contributing factor of water quality not

[100] Ms Bartons EIC paragraph 163(a)(ii) Note they are clauses (f) and (g) in the updated version of the Chapters provided by Ms Barton on 28 March
[101] Ms Barton EIC paragraph 114 - 115

achieving the objectives and policies of the RPS in my section 2.3.1 above. I do not agree with Ms Barton's conclusion at her paragraph 116 that there is insufficient evidence the non-point source pollution is the cause of this poor water quality, for the reasons I set out in section 2.3.2 above. I also differ from Ms Barton in that I have taken into account what may occur if no regulatory regime is put in place. Existing decline will continue and existing intensive land uses (even if they make up a small proportion of the catchment) will be able to intensify and *increase* their nitrogen leaching[102]. This will result in more nitrogen entering waterbodies in the subzone, and poor water quality will decline further - an outcome which will not achieve the objectives and policies of the plan.

205. I have therefore recommended changes to Table 13.1 to include several new water management sub-zones.

#### *2.3.7.8 Table 13.2*

206. Table 13.2 sets out the nitrogen leaching maximums for regulated land uses, based on the LUC Class of the land they occupy.

207. The DV POP Table 13.2 only contains one 'set' of numbers. WFGC and the MOC seek the re inclusion of the NV Table 13.2, which contains a slightly different set of numbers as the nitrogen leaching maximum for year 1 from those in the DV POP, and the addition of further 'step down' maximums for years stretching out to year 20.

208. Ms Barton sets out the reasons[103] why the hearing panel did not adopt the NV POP version of Table 13.1 and identifies flaws in those reasons. She concludes that the numbers are clear and based on clear environmental science, and that the costs are not inappropriate, and that they will be effective. I agree with Ms Barton's analysis on pages 54 and 55 of her evidence in chief. Ms Barton's

[102] This is discussed in the evidence of Dr Dewes (paragraphs 5.6 – 5.38, 6.13 – 6.19, 8.7, 9.7 – 9.9 and 9.29) and modeled in the evidence of Dr Ausseil (Table 18, 19 and 20) and Dr Roygard (Table 40, 41,and 42)
[103] Ms Barton EIC pages 50 to 55

conclusions appear to support inclusion of the NV Table 13.1, and I am unclear as to why she has not recommended it.

209. I have assessed alternative options available for setting a nitrogen leaching limit in my section 2.3.4 above. I consider that the NV POP nitrogen leaching limits are the most appropriate way to give effect to the strategies for water quality set out in the RPS. I show this table in my recommended version of the provisions in Appendix 2.

#### *2.3.7.9 Rule 13-1 etc*

210. Rule 13-1 provides that existing dairy farming land use activities are controlled activities, in targeted water management sub-zones. The rule incorporates a variety of discharges associated with farming that would otherwise be regulated by other rules in Chapter 13

211. I generally agree with Ms Barton's recommendation to retain this rule as a controlled activity, to require compliance with the nutrient management plan and nitrogen leaching maximums, and to remove 'reasonably practicable farm management practices' as a matter over which control is reserved.

212. I disagree with Ms Barton on two matters; the incorporation of 'alternate' nitrogen leaching maximums in the rule, and secondly the land uses controlled by the rule.

213. I have discussed the inclusion of various land uses in my section 2.3.2 above, and I recommend that dairy farming, market gardening, cropping and intensive sheep and beef farming all be included in the regulatory regime.

214. In her proposed amendments to (b) of the conditions / standards / terms section of Rule 13-1, Ms Barton provides for an one off exception to the nitrogen leaching maximums specified in Table 13.2, and provides that leaching may continue to occur at historic levels for one year with a one third reduction from that level each year for each of the next 3 years until the Table 13.1 limit is met.

It is my understanding from the technical evidence[104] that the nitrogen leaching maximums proposed by both Ms Barton and myself for year 1 are achievable with relative ease for the majority of farms, in some cases they are already met, and in other cases current leaching is below the year 1 maximums. Any delay to achieving them is a delay in the achievement of the Objectives of the One Plan. Providing for this delay in the controlled activity reduces the incentive to achieve the specified nitrogen leaching maximums promptly. I consider it is more appropriate to provide for land uses who wish to take this option to fall for consideration as a restricted discretionary activity. This further 'step down' has been provided for in my recommended Policy 13-2C.

215. A minor matter: I do not agree with the changes to matters of control (b) to incorporate conditions of Rule 13-6 and (c) to incorporate conditions of Rules 13-2, 13-3 and 13-4 and 13-4B. These conditions are already incorporated into the conditions/standards/terms of this rule, and must be complied with in order for the activity to be considered under this rule. Ms Barton has not explained this in her evidence in chief, and so I am unclear why they need to be referred to in the matters of control. I have not included these matters of control in my recommended wording for this rule, however, I keep an open mind if good reasons are put forward.

#### *2.3.7.10 Rule 13-1B*

216. In my opinion, the wording for this rule should be essentially the same as the wording for Rule 13-1 – the only difference being that it applies to new land uses throughout the region (instead of existing land uses in targeted water management sub-zones). My recommended changes in Appendix 2 reflect this. I also believe that Rule 13-1B could be combined with Rule 13-1, but for the purposes of simplicity I have left the approach the same as in the DV POP.

[104] Dr Dewes EIC paragraph 9.3, 9.5, 9.7, 9.9; Dr Ausseil EIC paragraphs 9.20 and 9.21; Taylor s42a officers report; Dr Shepherd, s42a officers report; Dr Manderson s42a officers report; Dr Ledgard EIC paragraph 11, 23, 25, 26, 30 – 32.

#### *2.3.7.11 Default Rule*

217. The DV POP contains two default rules to regulate activities that do not meet the conditions/standards/terms for the relevant controlled activity. Existing intensive farms in targeted water management sub-zones that do not meet the conditions for Rule 13-1 fall for consideration under Rule 13-1A and for new farms that cannot meet the conditions of Rule 13-1B fall for consideration under Rule 13-1C. These are both restricted discretionary rules. I agree with Ms Barton [105] that restricted discretionary is an appropriate activity status for consideration of these activities.

218. I have recommended changes to the matters of discretion. I believe that compliance with nitrogen leaching maximums should be a matter of control, rather than the currently stated 'reasonably practicable farm management practices'. As appropriate guidance on how this should be assessed (including exceptions) is provided in my recommended Policy 13-2C, I believe reference to this policy is useful. I also think it would be useful to reserve discretion over methods to avoid, remedy or mitigate losses of nutrients, sediment and faecal contamination that are not otherwise dealt with by the other controls.

219. I also believe that Rules 13-1A and 13-1C could be combined into one Rule with the same matters of discretion, with the different considerations for decision makers being provided in the policy. For simplicity I have not shown this in my recommended changes.

#### *2.3.7.12 Stock exclusion rule*

220. Should the Court not decide to regulate intensive sheep and beef farming or cropping to control their nitrogen leaching, or to not include all of the targeted catchments sought for inclusion in the appeals of WFGC and MOC, then I believe there is scope to consider stock exclusion separately.

221. I have discussed the benefits of stock exclusion and the scope to include a rule to control stock access to water in my section 2.3.5.

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[105] Ms Barton EIC para 137

222. Even if all the land uses and catchments I have recommended for inclusion in a nutrient management regime are not accepted by the Court – stock exclusion for those land uses and water management sub-zones can be dealt with separately.

223. I have included a framework for a rule which controls stock access for all the originally notified land uses (those that involve stock) and water management subzones.

#### *2.3.7.13 Sand country LUC*

224. Evidence from Mr Grant identifies that where limitations of sand country of erosion or climate are overcome by irrigation, then LUC class can be reassigned. This seems to be a reasonable framework. Ms Barton does not propose any changes to reflect this[106]. However, it is my understanding that the current Land Use Capability Survey Handbook does not currently reflect the approach taken by Mr Grant in his evidence. In order for properties on sand country to take advantage of the approach recommended by Mr Grant, it will need to be incorporated into the plan in some way. An appropriate way to do this would be to change the definition of LUC in the glossary to refer to the approach outlined by Mr Grant in his evidence. It would be even better if this approach was incorporated into a separate document, and published by HRC, and then this document could be referred to in the glossary. I have recommended generic wording in my Appendix 2.

#### *2.3.7.14 Other changes.*

225. I support the changes proposed by Ms Barton in her paragraph 164 – 169 to remove reference to grade Ab, Ba, Bb biosolids from Rules 13-1 and 13-1B.

#### *2.3.7.15 Schedule D*

226. WFGC has outstanding appeal points on two parameters included in Schedule D. The change in QMCI standard, and the inclusion of a deposited

[106] Ms Barton EIC paragraph 160

sediment standard. The changes required to Schedule D are set out in Associate Professor Death's evidence, and so I do not repeat them in my evidence.

## 2.4 Appendices

### 2.4.1 Appendix 1

**Versions of provisions**

| **Notified Version Proposed One Plan NV POP** | **Decisions Version Proposed One Plan DV POP** | **Mediated Version Proposed One Plan, with Horizons Proposed Amendments CBV POP** |
|---|---|---|
| **Objective 6-1: Water management values**<br>Surface waterbodies are managed in a manner which sustains their life-supporting capacity and recognises and provides for the values set out in Schedule D. | **Objective 6-1: *Water*^ management Values**<br>Surface *water bodies*^ and their *beds*^ are managed in a manner which has regard to the Values in Schedule AB. | **Objective 6-1: *Water*^ management Values**<br>Surface *water bodies*^ and their *beds*^ are managed in a manner which safeguards their life supporting capacity and advances the achievement of the Values in Schedule AB. |
| **Objective 6-2: Water quality**<br>(a) Surface water quality is managed to ensure that:<br>(i) water quality is maintained in those rivers where the existing water quality is sufficient to support the values of the river | **Objective 6-2: Water^ quality**<br>(a) Surface water^ quality is managed to ensure that:<br>(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 | **Objective 6-2: Water^ quality**<br>(a) Surface water^ quality is managed to ensure that:<br>(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 |

| **Notified Version Proposed One Plan NV POP** | **Decisions Version Proposed One Plan DV POP** | **Mediated Version Proposed One Plan, with Horizons Proposed Amendments CBV POP** |
|---|---|---|
| (ii) water quality is enhanced in those rivers where the existing water quality is not sufficient to support the values of the river<br>(iii) accelerated eutrophication or sedimentation of lakes in the Region is prevented or minimised<br>(iv) the special values of rivers protected by water conservation orders and local water conservation notices are maintained.<br>(b) Groundwater quality is managed to ensure that the existing groundwater quality is maintained.<br><br>**Policy 6-1: Water management zones and values** | (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<br>(iii) accelerated eutrophication and sedimentation of lakes^ in the Region is prevented or minimised<br>(iv) the special values of rivers^ protected by water conservation orders^ are maintained.<br>(b) Groundwater quality is managed to ensure that existing groundwater quality is maintained, or enhanced where it is degraded.<br><br>**Policy 6-1: *Water Management Zones** and Values**<br>For the purposes of managing *water*^ quality, | (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<br>(iii) accelerated eutrophication and sedimentation of lakes^ in the Region is prevented or minimised<br>(iv) the special values of rivers^ protected by water conservation orders^ are maintained.<br>(b) Groundwater quality is managed to ensure that existing groundwater quality is maintained, or where it is degraded / over-allocated as a result of human activity, groundwater quality is enhanced.<br><br>**Policy 6-1: *Water Management Zones** and Values** |

| **Notified Version Proposed One Plan NV POP** | **Decisions Version Proposed One Plan DV POP** | **Mediated Version Proposed One Plan, with Horizons Proposed Amendments CBV POP** |
|---|---|---|
| For the purposes of managing water quality, water quantity, and activities in the beds of rivers and lakes, the rivers and lakes in the Manawatu-Wanganui Region have been divided into the water management zones* shown in Schedule D. The rivers and lakes shall be managed in a manner which recognises and provides for the values identified in Schedule D for each water management zone*. The values and their associated purposes are set out in Table 6.2. | *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.2 Groundwater has been divided into *Groundwater Management Zones** in Schedule C.3<br><br>The *rivers*^ and *lakes*^ and their *beds*^ must be managed in a manner which has regard to the Schedule AB Values when decisions are made on avoiding, remedying or mitigating the adverse *effects*^ of activities. 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 | 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.2 Groundwater has been divided into *Groundwater Management Zones** in Schedule C.3<br><br>The *rivers*^ and *lakes*^ and their *beds*^ must be managed in a manner which safeguards their life supporting capacity and 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 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 |

| Notified Version Proposed One Plan NV POP | Decisions Version Proposed One Plan DV POP | Mediated Version Proposed One Plan, with Horizons Proposed Amendments CBV POP |
|---|---|---|
| | available) may have potential for hydroelectricity generation.<br><br>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*^. | Management Values Key and repeated in Table 6.2. [note that not all parties agreed to this wording]<br><br>*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*^. |
| **Policy 6-2: Water quality standards**<br>Water quality standards relating to the | **Policy 6-2: Water^ quality targets**<br>In Schedule D, water^ quality targets relating to the Schedule AB Values (repeated in | **Policy 6-2: Water^ quality numerics**<br>In Schedule D, water^ quality numerics relating to the Schedule AB Values (repeated |

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|---|---|---|
| values described in Policy 6-1 have been developed for each water management zone*, as shown in Schedule D. The water quality standards in Schedule D shall be used for the management of surface water quality in the manner set out in Policies 6-3, 6-4 and 6-5. | 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 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. | 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 numerics 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 standards are met**<br>(a) In each case where the existing water quality meets the relevant water quality standard within a water management zone*, as shown in Schedule D, activities shall be managed in a manner which ensures that the water quality standard continues to be met. | **Policy 6-3: Ongoing compliance where water^ quality targets are met**<br>(a) In each case where the existing water^ quality meets the relevant Schedule D water^ quality targets within a Water Management Sub-zone*, activities must be managed in a manner which ensures that the water^ quality targets continue to be met beyond the zone of reasonable mixing.<br>(b) For the avoidance of doubt: | **Policy 6-3: Ongoing compliance where water^ quality numerics are met**<br>(a) Where the existing water^ quality meets the relevant Schedule D water^ quality numerics within a Water Management Sub-zone*, water quality must be managed in a manner which ensures that the water^ quality numeric continues to be met beyond the zone of reasonable mixing (where mixing is applicable). |

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| (b) For the avoidance of doubt, subsection (a) applies:<br>(i) in circumstances where the existing water quality of a water management zone* meets all of the water quality standards for the zone (in which case subsection (a) applies to every water quality standard for the zone)<br>(ii) in circumstances where the existing water quality of a water management zone* meets some of the water quality standards for the zone (in which case subsection (a) applies only to those standards met).<br><br>**Policy 6-4: Enhancement where water** | (i) in circumstances where the existing water^ quality of a Water Management Sub-zone* meets all of the water^ quality targets for the Sub-zone* (a) applies to every water^ quality target for the Sub-zone*<br>(ii) in circumstances where the existing water^ quality of a Water Management Sub-zone* meets some of the water^ quality targets for the Sub-zone* (a) applies only to those targets met.<br><br>**Policy 6-4: Enhancement where water^ quality targets are not met** | (b) For the avoidance of doubt:<br>(i) in circumstances where the existing water^ quality of a Water Management Sub-zone* meets all of the water^ quality numerics for the Sub-zone* (a) applies to every water^ quality numerics for the Sub-zone*<br>(ii) in circumstances where the existing water^ quality of a Water Management Sub-zone* meets some of the water^ quality numerics for the Sub-zone* (a) applies only to those numeric that are met.<br>(iii) for the purpose of (a) reasonable mixing is only applicable to a discharge from an identifiable location.<br><br>**Policy 6-4: Enhancement where water^ quality numerics are not met** |

| Notified Version Proposed One Plan NV POP | Decisions Version Proposed One Plan DV POP | Mediated Version Proposed One Plan, with Horizons Proposed Amendments CBV POP |
|---|---|---|
| **quality standards are not met**<br>(a) In each case where the existing water quality does not meet the relevant water quality standard within a water management zone*, as shown in Schedule D, activities shall be managed in a manner which enhances water quality in order to meet the water quality standard for the water management zone* shown in Schedule D.<br>(b) For the avoidance of doubt, subsection (a) applies:<br>(i) in circumstances where the existing water quality of a water management zone* does not meet any of the water quality standards for the zone (in which case subsection (a) applies to every water quality standard for the zone)<br>(ii) in circumstances where the existing | (a) In each case where the existing water^ quality does not meet the relevant Schedule D water^ quality targets within a Water Management Sub-zone*, activities must be managed in a manner which, beyond the zone of reasonable mixing:<br>(i) enhances existing water^ quality where that is reasonably practicable, or otherwise maintains it, and<br>(ii) has regard to the likely effect^ of the activity on the relevant Schedule AB Value that the water^ quality target is designed to safeguard.<br>(b) For the avoidance of doubt:<br>(i) in circumstances where the existing water^ quality of a Water Management Sub-zone* does not meet all of the water^ quality targets for the Sub-zone*, (a) applies to every water^ quality target for the Sub-zone | (a) Where the existing water^ quality does not meet the relevant Schedule D water^ quality numerics within a Water Management Sub-zone*, water quality within the sub-zone must be managed in a manner that enhances existing water quality in order to meet (in a manner that is consistent with Policies 6-7, 6-7A, 6-7B and 6-8):<br>(i) the water quality numeric for the Water Management Zone in Schedule D; and / or<br>(iia) the relevant Schedule AB Values and management objectives that the water quality numeric is designed to safeguard.<br>(b) For the avoidance of doubt:<br>(i) in circumstances where the existing water^ quality of a Water Management Sub-zone* does not meet all of the water^ quality numerics for the Sub-zone*, (a) applies to every water^ quality numeric for the Sub-zone |

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| water quality of a water management zone* does not meet all of the water quality standards for the zone (in which case subsection (a) applies only to those standards not met). | (ii) in circumstances where the existing water^ quality of a Water Management Sub-zone* does not meet some of the water^ quality targets for the Sub-zone*, (a) applies only to those targets not met. | (ii) in circumstances where the existing water^ quality of a Water Management Sub-zone* does not meet some of the water^ quality targets [sic] for the Sub-zone*, (a) applies only to those targets [sic] not met. |
| **Policy 6-5: Management of activities in areas where existing water quality is unknown**<br>(a) In each case where there is insufficient data to enable a comparison of the existing water quality with the relevant water quality standard as shown in Schedule D, activities shall be managed in a manner which: | **Policy 6-5: Management of activities in areas where existing *water^* quality is unknown**<br>(a) In each case where there is insufficient data to enable a comparison of the existing *water^* quality with the relevant Schedule D *water^* quality targets,<br>activities must be managed in a manner which, beyond the zone of reasonable mixing: | **Policy 6-5: Management of water quality in areas where existing *water^* quality is unknown**<br>(a) Where there is insufficient data to enable a comparison of the existing *water^* quality with the relevant Schedule D *water^* quality numerics, water quality within the Water Management Sub-Zone must be managed in a manner which:<br>(i) maintains or enhances the existing |

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|---|---|---|
| (i) maintains or improves the existing water quality<br>(ii) has regard to the likely effect of the activity on the values identified for the relevant water management zone*<br>(iii) has regard to relevant information about the existing water quality in upstream or downstream water management zones*, where such information exists.<br>(b) For the avoidance of doubt, subsection (a) applies:<br>(i) in circumstances where there is insufficient data to enable a comparison of the existing water quality with any of the water quality standards for a water management zone* (in which case subsection (a) applies to every water quality | (i) maintains or enhances the existing *water*^ quality<br>(ii) has regard to the likely effect of the activity on the relevant Schedule AB Values that the *water*^ quality target is designed to safeguard<br>(iii) has regard to relevant information about the existing *water*^ quality in upstream or downstream *Water Management Sub-zones**, where such information exists.<br>(b) For the avoidance of doubt:<br>(i) in circumstances where there is insufficient data to enable a comparison of the existing water^ quality with all of the water^ quality targets for a Water Management Sub-zone* (a) applies to every water^ quality target for the Sub-zone*<br>(ii) in circumstances where there is insufficient data to enable a comparison | *water*^ quality<br>(ii) has regard to the likely effect of the activity on the relevant Schedule AB Values that the *water*^ quality numeric is designed to safeguard<br>(iii) has regard to relevant information about the existing *water*^ quality in upstream or downstream *Water Management Sub-zones**, where such information exists.<br>(b) For the avoidance of doubt:<br>(i) in circumstances where there is insufficient data to enable a comparison of the existing water^ quality with all of the water^ quality numerics for a Water Management Sub-zone* (a) applies to every water^ quality numerics for the Sub-zone*<br>(ii) in circumstances where there is insufficient data to enable a comparison of the existing water^ quality with some |

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|---|---|---|
| standard for the zone)<br>(ii) in circumstances where there is insufficient data to enable a comparison of the existing water quality with all of the water quality standards for a water management zone* (in which case subsection (a) applies only to those standards with insufficient data).<br><br>**Policy 6-6: Maintenance of groundwater quality**<br>(a) Discharges and land-use activities shall be managed in a manner which maintains the existing groundwater quality.<br>(b) Groundwater takes in the vicinity of the coast shall be managed in a manner which avoids saltwater intrusion. | of the existing water^ quality with some of the water^ quality targets for a Water Management Sub-zone* (a) applies only to those targets with insufficient data.<br><br>**Policy 6-6: Maintenance of groundwater quality**<br>(a) *Discharges*^ and *land*^ use activities must be managed in a manner which maintains the existing groundwater quality, or enhances it where it is degraded.<br>(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.<br>(b) Groundwater takes in the vicinity of the | of the water^ quality numerics for a Water Management Sub-zone* (a) applies only to those numerics with insufficient data.<br><br>**Policy 6-6: Maintenance of groundwater quality**<br>(a) *Discharges*^ and *land*^ use activities must be managed in a manner which maintains the existing groundwater quality, where groundwater quality is degraded / over allocated as a result of human activity, it is enhanced.<br>(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* |

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| | coast must be managed in a manner which avoids saltwater intrusion. | *practicable option*^ is adopted for the treatment and *discharge*^ system.<br>(b) Groundwater takes in the vicinity of the coast must be managed in a manner which avoids saltwater intrusion. |
| **Policy 6-7: Land-use activities affecting surface water quality**<br>(a) **Nutrients**<br>(i) Intensive farming land-use activities shall be regulated in targeted water management zones*.<br>(ii) For the purposes of subsection (a)(i), targeted water management zones* shall be those zones where, collectively, intensive farming land-use activities are the predominant cause of elevated | **Policy 6-7: Land^ use activities affecting groundwater and surface water^ quality**<br>(a) **Nutrients**<br>(i) Existing dairy farming* land^ use activities must be regulated in specified Water Management Sub-zones* 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^.<br>(ia) New dairy farming* land^ use activities must be regulated throughout the Region so as not to exceed nitrogen leaching rates based on the natural capital* of each LUC* | **Policy 6-7Dairy farming activities affecting groundwater and surface water^ quality**<br>The management of dairy farming land use activities affecting 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, and by managing diffuse discharges of contaminants in the following manner:<br>(a) **Nutrients**<br>(i) Existing dairy farming* land^ use activities must be regulated in specified Water Management Sub-zones* to achieve nutrient |

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| nutrient levels.<br>(iii) Those persons carrying out intensive farming land-use activities in the water management zones* targeted in subsection (a)(i) shall be required, amongst other things, to prepare a nutrient management plan for the purposes of:<br>(1) establishing the measures required to achieve the target contaminant loading rates for the relevant water management zone*, as specified in Schedule D<br>(2) identifying best management practices<br>(3) establishing programmes for implementing any required changes.<br><br>(b) **Faecal contamination**<br>(i) Intensive farming land-use activities | 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^.<br>(ii) For the purposes of (a)(i), specified Water Management Subzones* 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^.<br><br>(b) **Faecal contamination**<br>(iii) Those persons carrying out existing dairy farming* land^ use activities in the Water Management Sub-zones* listed in Table 13.1 or new conversions to dairy farming* anywhere in the Region must be required, amongst other things, to | management planning by:<br>(A) Setting nitrogen leaching rates for each LUC class of land which must not be exceeded except as provided for in (B)<br>(B) Providing a three year step down approach to meet the nitrogen leaching rate for each LUC class of land. In year one the annual average nitrogen leaching loss from the dairy farm must be based on the nutrient loss in year 2011. In year two there must be either a 33% reduction in the difference between the loss limit set in year one and the nitrogen leaching maximum set out in Table 13.2 or a reduction of 2kg/N/ha whichever is the greater. In year three there must be a further 33% reduction from the loss limit set for year one and the nitrogen leaching maximum set out in Table 13.2 or a reduction of 2kg/N/ha whichever is the greater. With achievement of the nitrogen leaching rate for |

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| shall be regulated in targeted water management zones*.<br>(ii) For the purposes of subsection (b)(i), targeted water management zones* shall be those zones where, collectively, intensive farming land-use activities are causing elevated faecal contamination levels.<br>(iii) Those persons carrying out intensive farming land-use activities in the water management zones* targeted in subsection (b)(i) shall be required, amongst other things, to<br>(1) prevent stock access to waterbodies<br>(2) mitigate against faecal contamination from other entry points (eg., race run-off)<br>(3) establish programmes for implementing any required changes. | (1) prevent dairy cattle access to some surface water bodies^ and their beds^<br>(2) mitigate faecal contamination of surface water^ from other entry points (eg., race run-off)<br>(3) establish programmes for implementing any required changes.<br><br>(c) **Sediment**<br>(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. | each LUC class of land by year four.<br>(C) excluding cattle and deer from some surface water bodies and their beds, and<br>(D) the requirement for dairy cattle crossings over some rivers.<br>(ia) New dairy farming* land^ use activities must be regulated throughout the Region so as not to exceed nitrogen leaching rates 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^.<br>(ii) For the purposes of (a)(i), specified Water Management Subzones* 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 |

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| (c) **Sediment**<br>(i) In those water management zones* where agricultural land-use activities are the predominant cause of elevated sediment levels, non-regulatory whole farm business plans* shall be prepared and implemented for the purpose of reducing soil erosion, as described in Chapter 5. | | surface water^.<br>(iii) Existing and new dairy farming land use activities shall manage nitrogen leaching rates in order to advance the achievement of the Schedule AB Values in the water quality numeric for the Water Management Zone in Schedule D no later that [sic] the first ten year anniversary of the relevant common catchment expiry date in Table 11A.1.<br><br>(b) **Faecal contamination**<br>(iii) Those persons carrying out existing dairy farming* land^ use activities in the Water Management Sub-zones* listed in Table 13.1 or new conversions to dairy farming* anywhere in the Region must be required, amongst other things, to<br>(1) prevent dairy cattle access to some surface water bodies^ and their beds^<br>(2) mitigate faecal contamination of surface |

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| | | water^ from other entry points (eg., race run-off)<br>(3) establish programmes for implementing any required changes to advance the achievement of the Schedule AB Values in the water quality numeric for the Water Management Zone in Schedule D no later than the first ten year anniversary of the relevant common catchment expiry date in Table 11A.1<br><br>(c) **Sediment**<br>(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 |

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| | | purpose of reducing the risk of *accelerated erosion**, as described in Chapter 5.<br><br>**Policy 6-7A: Rural *land*^ use activities (other than dairying) affecting groundwater and surface *water*^ quality in Water Management *Sub-zones** listed in Table 13.1**<br>*Rural land*^ use activities (other than dairy) affecting groundwater and surface *water*^ quality in the Water Management *Sub-zones** listed in Table 13.1 shall be managed in the following manner:<br>(a) The management of water quality within the Water Management *Sub-zones** listed in Table 13.1 must acknowledge that all rural *land*^ use activities (other than dairying) have the potential to affect water quality.<br>(b) Rural land use activities other than dairying that make a significant contribution to problem nutrient levels in surface water bodies must be actively managed, including through regulation. |

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| | | (c) The adequacy of the approach taken in the One Plan must be reviewed as further monitoring data is available and no later than 30 June 2017, to enable assessment of progress towards achieving the water quality numerics in Schedule D. Where necessary regulatory control will be extended over all rural *land*^ use activities including through requiring compliance with relevant industry standards and codes where they exist and through amending the cumulative nitrogen leaching maximums by Land Use Capability Class contained in Table 13.2.<br>(d) As additional *land*^ use activities are regulated then the policy framework may include mechanisms to provide for nitrogen trading.<br><br>**Policy 6-7B: Existing dairy farming* and other rural l*and*^ use activities in *Water Management Sub-zones** not listed in Table 13.1**<br>To advance the achievement of the Schedule AB Values for all *Water Management Sub-Zones** not listed in Table |

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| | | 13.1 through the following:<br>(a) Focus on the following *Water Management Sub-Zones* as priority catchments for monitoring and assessment:<br>(i) Mowhanau (West_3)<br>(ii) Lake Horowhenua (Hoki_1a and Hoki_1b)<br>(iii) Other south-west catchments (Waitarere) (West_7)<br>(iv) Other coastal lakes (West_4 and West_5)<br>(iii) Coastal Rangitikei (Rang_4)<br>(iv) Mangawhero /Makotuku (Whau_3b, Whau_3c and Whau_3d)<br>(b) Additional *Water Management Sub-Zones***must be added to Table 13.1 through a change to the One Plan when water quality and land use monitoring within a *Water Management Sub-Zone**demonstrates water quality such that the Schedule D water quality numerics are not met and/or the relevant Schedule AB values are |

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| | | compromised and these changes can reasonably be attributed to specified *land*^ use activities.<br><br>. |
| ***Regional Plan*** | ***Regional Plan***<br><br>**Objective 13-1: Regulation of *discharges*^ to *land*^ and *water*^**<br>The regulation of *discharges*^ onto or into *land*^ (including those that enter *water*^) or directly into *water*^ in a manner that:<br>(a) has regard to the Values and management objectives in Schedule AB,<br>(b) has regard to the objectives and policies of Chapter 6 as they relate to surface *water*^ and groundwater quality, and<br>(c) where a *discharge*^ is onto or into *land*^, avoids, remedies or mitigates adverse | ***Regional Plan***<br><br>**Objective 13-1: Management of *discharges*^ to *land*^ and *water*^**<br>The management of *discharges*^ onto or into *land*^ (including those that enter *water*^) or directly into *water*^ in a manner that:<br>(a) Safeguards the life supporting capacity of water and advances the achievement of the Values and management objectives in Schedule AB,<br>(b) provides for the objectives and policies of |

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| | *effects*^ on surface *water*^ or groundwater.<br><br>**Policy 13-2C: Management of *dairy farming* land*^ uses**<br>When making decisions on *resource consent*^ applications, and setting consent *conditions*^, for *dairy farming** as a *land*^ use, the Regional Council must:<br>(a) have regard to Policy 6-7,<br>(b) ensure that nitrogen leaching from the *land*^ is minimised as far as reasonably practicable for existing *land*^ uses,<br>(c) ensure that nitrogen leaching from new *dairy farming* land*^ uses does not exceed | Chapter 6 as they relate to surface *water*^ and groundwater quality, and<br>(c) where a *discharge*^ is onto or into *land*^, avoids, remedies or mitigates adverse *effects*^ on surface *water*^ or groundwater.<br><br>**Policy 13-2C: Management of new and existing *dairy farming* land*^ uses**<br>When making decisions on *resource consent*^ applications, and setting consent *conditions*^, for *dairy farming** as a *land*^ use, the Regional Council must:<br>(a) give effect to Policy 6-7.<br>(b) seek to exclude cattle and deer from the following waterbodies within the *water management sub-zones** listed in Table 13.1:<br>(i) a wetland or lake that is a rare habitat***,** threatened habitat***** or at risk habitat*.<br>(ii) a river that is permanently flowing, or is intermittently flowing with an active *bed** width greater than 1 metre (when measured as an average across the |

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| | nitrogen leaching rates based on the *natural capital** of each *LUC** class of *land*^ used for *dairy farming**, and<br>(d) ensure that dairy cattle are excluded from surface *water*^ as far as reasonably practicable. | property) at any time the bed contains water.<br>For the purposes of this policy "exclude" means stock access must be restricted to the *waterbody** by any permanent or temporary fence or barrier or any natural barrier. Where there are more than 1350 stock movements per week across a river identified in (b)(ii) then a culvert or bridge shall be installed.<br>Existing Dairy Farming* *land*^ uses<br>(a) ensure that nitrogen leaching from existing *dairy farming** *land*^ uses does not exceed nitrogen leaching rates for each *LUC** class of *land*^ as set out in Table 13.2. Where achievement of the Table 13.2 nitrogen leaching rate maximum is not immediately possible then:<br>(i) the nitrogen leaching loss from the farm must be based on the actual demonstrated nitrogen leaching loss for the 2011 year; and<br>(ii) the nitrogen leaching loss limit calculated under (c)(i) shall be reduced through conditions of consent to meet the Table 13.2 nitrogen leaching rate maximum in the following manner:<br>(A) In year two there must be a 33% reduction in the difference between the loss limit set under (c)(i) and the *nitrogen leaching maximum** set out in Table 13.2 |

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| | | or a reduction of 2kg/N/ha whichever is the greater.<br>(B) In year three there must be a further 33% reduction in the difference between the loss limit set under (c)(i) and the *nitrogen leaching maximum** set out in Table 13.2 or a reduction of 2kg/N/ha whichever is the greater.<br>(C) In year four the Table 13.2 nitrogen leaching rate must be achieved.<br>(d) an exception to (c) may be made in circumstances where:<br>a. the land contains 50% or higher of LUC Classes IV to VIII and has an average rainfall per annum in excess of 1500mm.<br>In relation to the exception identified in (d)(i) consent conditions will require:<br>i. best management practices to be in place to minimise the loss of nitrogen, phosphorous, faecal contamination and sediment.<br>ii. any losses of nitrogen, phosphorous, faecal contamination and sediment which cannot be avoided, remedied or mitigated are offset or mitigated including by way of environmental compensation offered by the applicant.<br>New Dairy Farming* *land*^ uses<br>(e) ensure that nitrogen leaching from new *dairy farming** *land*^ uses does not exceed |

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| | | nitrogen leaching rates based on the *natural capital** of each *LUC** class of *land*^ used for *dairy farming**.<br><br>Restricted Discretionary Activity New and Existing Dairy Farming* *land*^ uses (considered under Rules 13-1A and 13-1C)<br>(g) [sic] In relation to Rules 13-1A and 13-1C reasonably practicable farm management practices for minimising nutrient leaching, faecal contamination and sediment losses from the *land*^ include but are not limited to:<br>(i) Cut and carry;<br>(ii) Intensive forage cropping;<br>(iii) Herd homes and effluent capture;<br>(iv) Winter feed pads and effluent capture;<br>(v) Low nitrogen feeds;<br>(vi) Replace nitrogen fertiliser with equivalent supplements;<br>(vii) Graze animals off-farm over the winter months;<br>(viii) Reducing stock rate;<br>(ix) Best management (amount and timing and land area) of nitrogen fertiliser inputs;<br>(x) Management of infrastructure (e.g. reducing leaks in effluent irrigation systems and lining of effluent ponds and |

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| **Rules: Agricultural Activities**<br>Table 13.1 sets out the target water management zones where management of intensive farming land-use activities will be specifically controlled. The table includes the dates after which the provisions of the One Plan that relate to these water management zones come into force. | **Rules - Agricultural Activities**<br>Table 13.1 sets out the target *Water Management Sub-zones** where management of existing *dairy farming** *land*^ use activities must be specifically controlled. | feedpads);<br>(xi) Nitrogen inhibitors;<br>(xii) Non-pastoral land use; and<br>(xiii) Creation of wetland and riparian zones.<br>(h) The implementation of reasonably practicable farm management practices to reduce nitrogen leaching must achieve the nitrogen leaching rates for each *LUC** class of *land*^ as set out in Table 13.2 no later than the first ten year anniversary of the common catchment expiry dates set in Table 11A-1.<br><br>**Rules - Agricultural Activities**<br>Table 13.1 sets out the target *Water Management Sub-zones** where management of existing *dairy farming** *land*^ use activities must be specifically controlled. |

### 2.4.2 Appendix 2

## Recommended Track Changes versions of provisions

Recommended provisions showing track changes in ~~strike through~~ and underline from DV POP. This includes changes from Ms Barton's evidence and the mediated version where those changes form part of my recommendations. 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 releant to these proceedings are not shown in this version of Chapter 6.

# 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 W*ater 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

.

## 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 of the Values ~~has regard to the Values~~ in Schedule AB[107].

[107] 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 w*ater 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.[108] Groundwater has been divided into *Groundwater Management Zones** in Schedule C.[109]

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~~

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

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

~~*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*^.~~

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

| Value Group | | Individual Values | Management Objective |
|---|---|---|---|
| **Ecosystem Values** | NS | Natural State | The *river*^ and its *bed*^ are maintained in their natural state |
| | LSC | Life-supporting Capacity | The *water body*^ and its *bed*^ 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 *water body*^ and its *bed*^ sustain healthy inanga spawning and egg development |
| | WM | *Whitebait** Migration | The *water body*^ and its *bed*^ are maintained or enhanced to provide safe passage of inwardly migrating juvenile native fish known collectively as *whitebait** |
| | | | |
| **Recreational and Cultural Values** | CR | Contact Recreation | The *water body*^ and its *bed*^ are suitable for contact recreation |
| | AM | *Amenity* | The amenity values of the *water body*^ and its *bed*^ (and its margins where in public ownership) are maintained or enhanced |
| | MAU | *Mauri** | The *mauri** of the *water body*^ and its *bed*^ is maintained or enhanced |
| | SOS-C | Sites of Significance - Cultural | Sites of significance for cultural values are maintained |
| | TF | Trout Fishery | The *water body*^ and its *bed*^ sustain healthy rainbow or brown trout fisheries |
| | TS | Trout Spawning | The *water body*^ and its *bed*^ meet the requirements of rainbow and brown trout spawning and larval and fry development |
| | AE | Aesthetics | The aesthetic values of the *water body*^ and its *bed*^ are maintained or enhanced |
| | | | |
| ***Water*^ Use** | WS | *Water*^ Supply | The *water*^ is suitable, after treatment, as a drinking *water*^ source for human consumption |
| | IA | Industrial Abstraction | The *water*^ is suitable as a *water*^ source for industrial abstraction or use, including for hydroelectricity generation± |
| | I | Irrigation | The *water*^ is suitable as a *water*^ source for irrigation |
| | SW | Stockwater | The *water*^ is suitable as a supply of drinking *water*^ for livestock |
| | | | |
| **Social/ Economic Values** | CAP | Capacity to Assimilate Pollution | The capacity of a *water body*^ and its *bed*^ to assimilate pollution is not exceeded |
| | FC/D | Flood Control and Drainage | The integrity of existing flood and *river*^ bank erosion protection *structures*^ and existing drainage *structures*^ is not compromised and the risks associated with flooding and erosion are managed sustainably |
| | EI | Existing *Infrastructure*^ | The integrity of existing *infrastructure*^ 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 D[110], *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~~ limits 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:

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

~~(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 limit is designed to safeguard

~~(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~~s 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 farming 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 by (a) and land uses not identified by (b). Where monitoring shows the thresholds in (a) and (b) are met then the regional plan must be amended as soon as practicable 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 l*and*^ 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 maxiumums 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**

(ii) 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**

(iii) 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.

**[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** | 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 *Water Management Sub-zones** 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.<br><br>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.<br><br>The effectiveness of the protection and enhancement works will be monitored. |
| **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. |
| **Targets** | • The targets of the Dairying and Clean Streams Regional Action Plan for Manawatu-Wanganui Region are achieved by the due dates.<br>• Advice and assistance is offered to all landowners affected by the nutrient management rules.<br>• 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 |

| Method 6-8 | Education in Schools - Water |
|---|---|
| | 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** | The Regional Council and other agencies will work with all agencies to protect and enhance Lake Horowhenua and other coastal lakes.<br><br>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.<br><br>The effectiveness of the protection and enhancement works in achieving improved water quality within Lake Horowhenua and other Coastal Lakes will be monitored.<br><br>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. |
| **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, 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-X and 6-7. |
| **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.<br><br>In *Water Management Sub-zones**:<br>• where water quality targets are met prior to this Plan becoming operative, they continue to be met<br>• 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 | Water Policies: 6-1, 6-2, 6-3, 6-4, 6-5, 6-7, 6-8, 6-9, 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<br><br>Land Policies: 5-1, 5-2A and 5-5<br><br>Living Heritage Policies: 7-1, 7-2A, 7-4, 7-5 and 7-8 | • Measured water quality compared to *Water Management Sub-zone** targets, especially measures for "muddy waterways", "safe swimming", "safe food gathering", and "aquatic ecosystem health" in priority catchments<br>• Incidents where surface water quality is confirmed as unfit for use<br>• Measured flows of surface water compared to the allocation and minimum flow regime outlined in this Plan | • The Regional Council's State of Environment water quality and quantity monitoring programme<br>• The Regional Council's incidents database<br>• Ministry of Health raw water monitoring |

| Anticipated Environmental Result | Link to Policy | Indicator | Data Source |
|---|---|---|---|
| Plan becoming operative. | | | |
| By 2017, the natural, physical and cultural qualities of the beds of rivers are suitable for specified *Water Management Sub-zone** Values. | Water Policies: 6-1, 6-27, 6-28, 6-29, 6-30 and 6-31 | • Confirmed incidents of damage to the beds of rivers<br>• Consents granted for activities in beds of rivers and lakes | • The Regional Council's incidents database<br>• The Regional Council's consents database |
| 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. | Water Policies: 6-6, 6-9, 6-12, 6-13, 6-21 and 6-23 | • Groundwater levels Region-wide, but with a focus on Opiki and Himatangi areas<br>• Groundwater quality Region-wide, but with a focus on nitrates in Horowhenua and Tararua districts and conductivity along the Foxton-Tangimoana coast<br>• Confirmed incidents where groundwater sources become unavailable (ie., dry up) or water quality is unfit for use | • The Regional Council's State of Environment groundwater monitoring programme<br>• The Regional Council's compliance monitoring programme<br>• The Regional Council's incidents database<br>• 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-zone*s* 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*~~ *intensive 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).

# 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 are identified as intensive farming land uses:

(i) *Dairy farming**

(ii) *Commercial vegetable production**

(iii) *Cropping**

(iv) *Intensive sheep and beef 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.

(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 grat than 1 metre (when measured as an average acoss 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:

(b) ~~have regard to Policy 6-7,~~

(c) ensure that nitrogen leaching from the *land*^ is managed in accordance Policy 13-2C.

(d) 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

(e) 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

(f) 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.

(g) ~~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~~

(h) ensure that ~~dairy~~ cattle are excluded from surface *water*^ ~~as far as reasonably practicable~~ in accordance with Policy 13-2C(f) and (g)

(i) an exception may be made to (g) in circumstances where landscape or geographical constraints make stock exclusion impracticable, in which case any unavoided loses 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.

## 13.2 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<br>Middle Mangatainoka Mana_8b<br>Lower Mangatainoka Mana_8c<br>Makakahi Mana_8d | 1 July 2012 |
| Upper Manawatu above Hopelands | Upper Manawatu Mana_1a<br>Mangatewainui Mana_1b<br>Mangatoro Mana_1c<br>Weber-Tamaki Mana_2a<br>Mangatera Mana_2b<br>Upper Tamaki Mana_3<br>Upper Kumeti Mana_4<br>Tamaki-Hopelands Mana_5a<br>Lower Tamaki Mana_5b<br>Lower Kumeti Mana_5c<br>Oruakeretaki Mana_5d<br>Raparapawai Mana_5e | 1 July 2012 |
| Lake Horowhenua | Lake Horowhenua Hoki_1a<br>Hokio Hoki_1b | 1 July 2012 |
| Waikawa | Waikawa West_9a<br>Waikawa West_9b | 1 July 2012 |
| Manawatu above gorge | Hopelands-Tiraumea Mana_6<br>Upper Gorge Mana_9a<br>Mangaatua Mana_9c | 1 July 2012 |

| Catchment | *Water Management Sub-zone** | *Date Rule 13-1 comes into force* |
|---|---|---|
| Other south-west catchments (Papaitonga) | Lake Papaitonga West_8 | 1 July 2013 |
| Coastal Rangitikei | Coastal Rangitikei Rang_4 | 1 July 2014 |
| Other coastal lakes | Northern Manawatu Lakes West_6<br>Kaitoke Lakes West_4<br>Southern Wanganui Lakes West_5 | 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 the 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<br>Non-Notification |
|---|---|---|---|---|
| **13-1 Existing ~~*dairy*~~ *intensive farming** *land^* use activities** | The use of *land^* pursuant to s9(2) RMA for any of the folowing types of ~~*dairy*~~ *intensive farming**:<br>(a) dairy farming*<br>(b) commerical vegetable | **Controlled** | (a) A *nutrient management plan** must be prepared for the *land^*, ~~complied with~~ and provided annually to the Regional Council.<br>(aa) The activity must be undertaken in accordance with the nutrient management plan prepared under (a) | Control is reserved over:<br>(a) the implementation of the nutrient management plan. ~~reasonably practicable farm management practices for minimising nutrient leaching, faecal contamination and~~ |

| Rule | Activity | Classification | Conditions/Standards/Terms | Control/Discretion<br>Non-Notification |
|---|---|---|---|---|
| | growing*<br>(c) cropping*<br>(d) intensive sheep and beef farming*<br>that was existing as at 1 July 2010 in *the Water Management Sub-zones** listed in Table 13.1 and any of the following *discharges*^ pursuant to ss15(1) or 15(2A) RMA associated with that intensive ~~*dairy*~~ *farming**:<br>(e) the *discharge*^ of *fertiliser** onto or into *land*^<br>(f) the *discharge*^ of *contaminants*^ onto or into *land*^ from<br>(i) the preparation, storage, use or transportation of stock feed on *production land*^<br>(ii) the use of a *feedpad**<br>(g) the *discharge*^ of grade Aa~~, Ab, Ba or Bb~~ *biosolids*^, *soil conditioners** or *compost** onto or into *production land*^<br>(h) the *discharge*^ of *poultry farm litter** onto or into *production land*^<br>(i) the *discharge*^ of farm *animal effluent** onto or into *production land*^ (or upon expiry or surrender of any existing consent for that *discharge*^) including: | | (ab) The nutrient management plan prepared under (a) must demonstrate that the nitrogen leaching loss from the activity will not exceed the nitrogen leaching maximum specified in Table 13.2.<br>(b) ~~Dairy~~ Cattle must be excluded from:<br>(i) *wetlands*^ and *lakes*^ that are a *rare habitat** or *threatened habitat**, *and*<br>(ii) *the beds*^ of *rivers*^ that are permanently flowing or have an *active bed** width greater than 1 m, other than at any specific location where access is required for ~~dairy~~ cattle to cross the *river*^ in which case (c) applies.<br>(c) *Rivers*^ that are permanently flowing or have an *active bed** width greater than 1 m, that are crossed by more than 1350 dairy 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 *discharged*^ onto or into *land*^.<br>(d) The *discharge*^ of *fertiliser** onto or into *land*^ and any ancillary *discharge*^ of *contaminants*^ into air must comply with the *conditions*^ of Rule 13-2.<br>(e) The *discharge*^ of *contaminants*^ onto or into *land*^ from:<br>(i) the preparation, storage, use or transportation of stock feed on *production land*^, or<br>(ii) the use of a *feedpad**<br>and any ancillary *discharge*^ of *contaminants*^ into | ~~sediment losses from the *land*^~~<br>(aa) compliance with the nitrogen leaching maximums specified in Table 13.2<br>(b) the matters of control in Rule 13-6<br>(c) avoiding, remedying or mitigating the effects of odour, dust, *fertiliser** drift or effluent drift<br>(d) provision of information including the *nutrient management plan**<br>(e) duration of consent<br>(f) review of consent *conditions*^<br>(g) compliance monitoring.<br><br>*Resource consent*^ applications under this *rule*^ will not be notified and written approval of affected persons will not be required (notice of applications need not be *served*^ on affected persons). |

| Rule | Activity | Classification | Conditions/Standards/Terms | Control/Discretion<br>Non-Notification |
|---|---|---|---|---|
| | (i) effluent from dairy sheds and *feedpads**<br>(ii) effluent received from piggeries<br>(iii) sludge from farm effluent ponds<br>(iv) poultry farm effluent<br>and any ancillary *discharge*^ of *contaminants*^ into air pursuant to ss15(1) or 15(2A) RMA.<br><br>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. | | air must comply with the *conditions*^ of Rule 13-3.<br>(f) The *discharge*^ of grade Aa *biosolids**, *soil conditioners** or *compost** onto or into *production land*^ and any ancillary *discharge*^ of *contaminants*^ into air must comply with the *conditions*^ of Rule 13-4.<br>(g) ~~The *discharge*^ of grade Ab, Ba or Bb *biosolids** onto or into *production land*^ and any ancillary *discharge*^ of *contaminants*^ into air must comply with the *conditions*^ of Rule 13-4A.~~<br>(h) The *discharge*^ of *poultry farm litter** onto or into *production land*^ and any ancillary *discharge*^ of *contaminants*^ into air must comply with the *conditions*^ of Rule 13-4B.<br>(i) The *discharge*^ of farm *animal effluent** onto or into *production land*^ including:<br>(i) effluent from dairy sheds and *feedpads**<br>(ii) effluent received from piggeries<br>(iii) sludge from farm effluent ponds<br>(iv) poultry farm effluent<br>and any ancillary *discharge*^ of *contaminants*^ into air must comply with the *conditions*^, standards and terms of Rule 13-6. | |
| **13-1A Existing ~~*dairy*~~ *intensive farming** *land*^ use activities not complying with Rule 13-1** | The use of *land*^ pursuant to s9(2) RMA for any of the folowing types of ~~*dairy*~~ *intensive farming**:<br>(j) dairy farming*<br>(k) commerical vegetable growing*<br>(l) cropping* | **Restricted Discretionary** | | Discretion is restricted to:<br>(a) preparation of, and compliance with a *nutrient management plan** for the *land*^<br>(aa) compliance with the nitrogen leaching maximums specified in Table 13.2 |

| Rule | Activity | Classification | Conditions/Standards/Terms | Control/Discretion<br>Non-Notification |
|---|---|---|---|---|
| | (m) intensive sheep and beef farming*<br>that was existing as at 1 July 2010 in *the Water Management Sub-zones** listed in Table 13.1, and any of the following *discharges*^ pursuant to ss15(1) or 15(2A) RMA associated with ~~*dairy*~~ *intensive farming**, that do not comply with one or more of the *conditions*^, standards and terms of Rule 13-1:<br>(a) the *discharge*^ of *fertiliser** onto or into *land*^<br>(b) the *discharge*^ of *contaminants*^ onto or into *land*^ from<br>(i) the preparation, storage, use or transportation of stock feed on *production land*^<br>(ii) the use of a *feedpad**<br>(c) the *discharge*^ of grade Aa, ~~Ab, Ba or Bb~~ *biosolids*^, *soil conditioners** or *compost** onto or into *production land*^<br>(d) the *discharge*^ of *poultry farm litter** onto or into *production land*^<br>(e) the *discharge*^ of farm *animal effluent** onto or into *production land*^ (or upon expiry or surrender of any existing consent for that *discharge*^) including:<br>(i) effluent from dairy sheds and *feedpads** | | | (b) ~~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 *land*^<br>(c) measures to exclude dairy cattle from *wetlands*^ and *lakes*^ that are a *rare habitat** or *threatened habitat**, and *rivers*^ that are permanently flowing or have an *active bed** width greater than 1 m<br>(d) the bridging or culverting of *rivers*^ that are permanently flowing or have an *active bed** width greater than 1 m that are crossed by dairy cattle<br>(e) the matters referred to in the *conditions*^ of Rules 13-2, 13-3, 13-4, ~~13-4A~~ and 13-4B<br>(f) the matters referred to in the *conditions*^ of Rule 13-6 and the matters of control in Rule 13-6<br>(g) avoiding, remedying or mitigating the effects of odour, dust, *fertiliser** drift or effluent drift<br>(h) provision of information including the annual *nutrient management plan**<br>(i) duration of consent<br>(j) review of consent *conditions*^ |

| Rule | Activity | Classification | Conditions/Standards/Terms | Control/Discretion<br>Non-Notification |
|---|---|---|---|---|
| | (ii) effluent received from piggeries<br>(iii) sludge from farm effluent ponds<br>(iv) poultry farm effluent<br>and any ancillary *discharge*^ of *contaminants*^ into air pursuant to ss15(1) or 15(2A) RMA. | | | (k) compliance monitoring. |
| **13-1B New ~~*dairy*~~ *intensive farming** *land*^ use activities** | The use of *land*^ pursuant to s9(2) RMA for any conversion to any of the folowing types of ~~*dairy*~~ *intensive farming**:<br>(a) dairy farming*<br>(b) commerical vegetable growing*<br>(c) cropping*<br>(d) intensive sheep and beef farming*<br>that occurs after 1 July 2010 anywhere within the Region and any of the following *discharges*^ pursuant to ss15(1) or 15(2A) RMA associated with ~~*dairy*~~ *intensive farming**:<br>(a) the *discharge*^ of *fertiliser** onto or into *land*^<br>(b) the *discharge*^ of *contaminants*^ onto or into *land*^ from<br>(i) the preparation, storage, use or transportation of stock feed on *production land*^<br>(ii) the use of a *feedpad**<br>(c) the *discharge*^ of grade Aa~~, Ab, Ba~~ | **Controlled** | (a) A *nutrient management plan** must be prepared for the *land*^, ~~complied with~~ and provided annually to the Regional Council.<br>(aa) The activity must be undertaken in accordance with the nutrient management plan prepared under (a)<br>(ab) The nutrient management plan prepared under (a) must demonstrate that the nitrogen leaching loss from the activity will not exceed the nitrogen leaching maximum specified in Table 13.2.<br>(b) ~~Dairy~~ Cattle must be excluded from:<br>(iii) *wetlands*^ and *lakes*^ that are a *rare habitat** or *threatened habitat**, *and*<br>(iv) *the beds*^ of *rivers*^ that are permanently flowing or have an *active bed** width greater than 1 m, other than at any specific location where access is required for ~~dairy~~ cattle to cross the *river*^ in which case (c) applies.<br>(c) *Rivers*^ that are permanently flowing or have an *active bed** width greater than 1 m, that are crossed by more than 1350 dairy 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 *discharged*^ onto or into | Control is reserved over:<br>(a) the implementation of the nutrient management plan. ~~farm management practices to maintain compliance with the *cumulative nitrogen leaching maximum** for the *land*^~><br>aa) compliance with the nitrogen leaching maximums specified in Table 13.2<br>(b) ~~the implementation of reasonably practicable farm management practices for minimising nutrient leaching, faecal contamination and sediment losses from the *land*^~><br>(c) the matters of control in Rule 13-6<br>(d) avoiding, remedying or mitigating the effects of odour, dust, *fertiliser** drift or effluent drift<br>(e) provision of information including the *nutrient management plan**<br>(f) duration of consent<br>(g) review of consent *conditions*^<br>(h) compliance monitoring. |

| Rule | Activity | Classification | Conditions/Standards/Terms | Control/Discretion<br>Non-Notification |
|---|---|---|---|---|
| | ~~or Bb~~ *biosolids*^, *soil conditioners** or *compost** onto or into *production land*^<br>(d) the *discharge*^ of *poultry farm litter** onto or into *production land*^<br>(e) the *discharge*^ of farm *animal effluent** onto or into *production land*^ including:<br>(i) effluent from dairy sheds and *feedpads**<br>(ii) effluent received from piggeries<br>(iii) sludge from farm effluent ponds<br>(iv) poultry farm effluent<br>and any ancillary *discharge*^ of *contaminants*^ into air pursuant to ss15(1) or 15(2A) RMA. | | *land*^.<br>(e) The *discharge*^ of *fertiliser** onto or into *land*^ and any ancillary *discharge*^ of *contaminants*^ into air must comply with the *conditions*^ of Rule 13-2.<br>(f) The *discharge*^ of *contaminants*^ onto or into *land*^ from:<br>(i) the preparation, storage, use or transportation of stock feed on *production land*^, or<br>(ii) the use of a *feedpad**<br>and any ancillary *discharge*^ of *contaminants*^ into air must comply with the *conditions*^ of Rule 13-3.<br>(g) The *discharge*^ of grade Aa *biosolids**, *soil conditioners** or *compost** onto or into *production land*^ and any ancillary *discharge*^ of *contaminants*^ into air must comply with the *conditions*^ of Rule 13-4.<br>(h) ~~The *discharge*^ of grade Ab, Ba or Bb *biosolids** onto or into *production land*^ and any ancillary *discharge*^ of *contaminants*^ into air must comply with the *conditions*^ of Rule 13-4A.~~<br>(i) The *discharge*^ of *poultry farm litter** onto or into *production land*^ and any ancillary *discharge*^ of *contaminants*^ into air must comply with the *conditions*^ of Rule 13-4B.<br>(j) The *discharge*^ of farm *animal effluent** onto or into *production land*^ including:<br>(i) effluent from dairy sheds and *feedpads**<br>(ii) effluent received from piggeries<br>(iii) sludge from farm effluent ponds | *Resource consent*^ applications under this *rule*^ will not be notified and written approval of affected persons will not be required (notice of applications need not be *served*^ on affected persons). |

| Rule | Activity | Classification | Conditions/Standards/Terms | Control/Discretion<br>Non-Notification |
|---|---|---|---|---|
| | | | (iv) poultry farm effluent<br>and any ancillary *discharge*^ of *contaminants*^ into air must comply with the *conditions*^, standards and terms of Rule 13-6. | |
| **13-1C New Intensive ~~*dairy*~~ *farming** *land*^ use activities not complying with Rule 13-1B** | The use of *land*^ pursuant to s9(2) RMA for any of the folowing types of ~~*dairy*~~ *intensive farming**:<br>(e) dairy farming*<br>(f) commerical vegetable growing*<br>(g) cropping*<br>(h) intensive sheep and beef farming*<br>that occurs after 1 July 2010 anywhere within the Region, and any of the following *discharges*^ pursuant to ss15(1) or 15(2A) RMA associated with ~~*dairy*~~ *intensive farming**, that do not comply with one or more of the *conditions*^, standards and terms of Rule 13-1B:<br>(a) the *discharge*^ of *fertiliser** onto or into *land*^<br>(b) the *discharge*^ of *contaminants*^ onto or into *land*^ from<br>(i) the preparation, storage, use or transportation of stock feed on *production land*^<br>(ii) the use of a *feedpad**<br>(c) the *discharge*^ of grade Aa~~, Ab, Ba or Bb~~ *biosolids*^, *soil conditioners** or | **Restricted Discretionary** | | Discretion is restricted to:<br>(c) preparation of, and compliance with a *nutrient management plan** for the *land*^<br>(aa) compliance with the nitrogen leaching maximums specified in Table 13.2<br>(d) ~~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 *land*^<br>(e) measures to exclude dairy cattle from *wetlands*^ and *lakes*^ that are a *rare habitat** or *threatened habitat**, and *rivers*^ that are permanently flowing or have an *active bed** width greater than 1 m<br>(f) the bridging or culverting of *rivers*^ that are permanently flowing or have an *active bed** width greater than 1 m that are crossed by dairy cattle<br>(g) the matters referred to in the *conditions*^ of Rules 13-2, 13-3, 13-4, |

| Rule | Activity | Classification | Conditions/Standards/Terms | Control/Discretion<br>Non-Notification |
|---|---|---|---|---|
| | *compost** onto or into *production land*^<br>(d) the *discharge*^ of *poultry farm litter** onto or into *production land*^<br>(e) the *discharge*^ of farm *animal effluent** onto or into *production land*^ including:<br>(i) effluent from dairy sheds and *feedpads**<br>(ii) effluent received from piggeries<br>(iii) sludge from farm effluent ponds<br>(iv) poultry farm effluent<br>and any ancillary *discharge*^ of *contaminants*^ into air pursuant to ss15(1) or 15(2A) RMA. | | | ~~13-4A~~ and 13-4B<br>(h) the matters referred to in the *conditions*^ of Rule 13-6 and the matters of control in Rule 13-6<br>(i) avoiding, remedying or mitigating the effects of odour, dust, *fertiliser** drift or effluent drift<br>(j) provision of information including the annual *nutrient management plan**<br>(k) duration of consent<br>(l) review of consent *conditions*^<br>(m) compliance monitoring. |

**Remaining rules in this chapter not shown**

**Framework for stock exclusion rule**

| Rule | Activity | Classification | Conditions/Standards/Terms | Control/Discretion<br><br>Non-Notification |
|---|---|---|---|---|
| **13-1XX Intensive sheep and beef farming and cropping** | The use of *land*^ pursuant to s9(2) RMA for *intensive sheep and beef farming** and *cropping** that was<br>(a) *existing** on 1 July 2010 in the *Water Management Sub-zones** listed in Table 13.1, or<br>(b) established after 1 July 2010 in any *Water Management Sub-zone* | **Permitted** | (a) By 1 July 2012, cattle on land that is irrigated for the purpose of enhanced pasture or fodder crop production must be excluded from:<br>(i) *wetlands*^ and *lakes*^ that are a *rare habitat** or *threatened habitat**, and<br>(ii) the *beds*^ of *rivers*^ that are permanently flowing or have an *active bed** width greater than 1m, other than at any specific location where access is required for cattle to cross the *river*^ in which case (b) applies.<br>(b) *Rivers*^ that are permanently flowing or have an *active bed** width greater than 1m, which 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 *discharged*^ onto or into *land*^. | |

**Glossary**

**Cropping** means using an area of land in excess of 20 hectares to grow crops. A "crop" is defined as cereal, coarse grains, oilseed, peanuts, lupins, dry field peas or dry field beans. This definition does not include crops fed to animals or grazed on by animals on the same *property*^

**Intensive sheep and beef farming** means using land for sheep, beef and mixed sheep/beef farming on *properties*^ greater than 4 ha where irrigation is used in the farming activity.

**Land use capability class (LUC)** means a classification of a parcel of *land*^ in terms of five characteristics or attributes (rock, soil, *slope**, erosion, vegetation). The land use capability class can be derived either from the New Zealand Land Resource Inventory (NZLRI) or by a suitably qualified person specifically assessing and mapping the land use capability classes for a particular parcel of *land*^. Where the LUC is assessed by a suitably qualified person, that person may use the more favourable classification of the *land*^ available applying the 3rd or 2nd edition of the Land Use Capability Survey Handbook, or in the case of sand country, the classification of the land applying [the evidence of Mr Grant],.

**Market gardening** means using an area of land greater than 4 hectares for vegetable growing, on an annual basis, for human consumption.

Fruit crops and vegetables that are perennial are not included.

### 2.4.3 Appendix 3

## Summary tables of achievement of key limits in targeted water management sub-zones

## River Catchments

| Catchment name | Subzone name | N | P | Faecal | DO | Temp | Clarity | Periphyton | MCI | % N attributed to non-point source[111] | Expert conferencing Ecologists (require management?) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Upper Manawatu above Hopelands (Mana_1a – 1c, 2a – 2b, 3, 4, 5a - 5e)** | Manawatu at Weber Road | ✗[112] | ✗[112] | ✗[113] | - | - | - | ✗[114] | ✗[115] | 100% | Yes |
| | Mangatera (Mana_2b) at timber bay | - | - | ✗[113] | - | - | - | ✗[114] | ✗[115] | | Yes |
| | Manawatu at Hopelands | ✗[116] | ✗[116] | ✗[113] | - | - | - | ✗[114] | ✗[115] | 96.93% | Yes |
| **Mangatainoka** | Mangatainoka | ✗[117] | ✗[117] | ? | - | - | - | ✗[114] | ✗[115] | 99.26% | Yes |

[111] Roygard McArthur, Clark (2012) Table 6, pages 23 – 24
[112] Roygard, McArthur, Clark (2012) Figure 8 and 9, pages 37 - 38
[113] McArthur (2009) Map 21, page 191, page 197
[114] Roygard, McArthur, Clark (2012) Table 5, pages 17 - 19
[115] Roygard, McArthur, Clark (2012) Table 4, page 15
[116] Roygard, McArthur, Clark (2012) Figure 10 and 11, pages 38 - 39

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **(Mana_8a – 8d)** | (Mana_8a,8b,8c ) at SH2 | | | | | | | | | | |
| | Makakahi (Mana_8d) At Hamua | ✗[118] | ✓[118] | - | - | - | - | ✗[114] | ✗[115] | 99.72% | Yes |
| **Mangapapa (Mana_9b)** | Mangapapa At Troup road | ✗[119] | ✗[119] | ✗[119] | - | - | - | ✗[120] (✓[114] 100%) | ✗[120] (✓ [115]standard exceeded 25% of sampling occasions) | | Not discussed |
| **Manawatu above Gorge** | Manawatu at upper gorge | ✗[121] | ✗[121] | ? | - | - | - | ✓[114] However severe Cyanobacteria blooms recorded[122] | ✓ [115] (standard exceeded 29% of sampling occasions) ✗[123] | 98.70% | Yes |

[117] Roygard, McArthur, Clark (2012)Figure 18 and 19, Pages 49 - 50
[118] Roygard, McArthur, Clark (2012)Figures 20 and 21, pages 50 - 51
[119] McArthur (2009) s42a report, Figure 20, 21, and 22, pages 156 - 160
[120] McArthur (2009) Table 21, page 180
[121] Roygard, McArthur, Clark (2012)Figures 26 and 27, pages 58 - 59
[122] Roygard, McArthur, Clark (2012) page 55
[123] McArthur (2009) s42a report Figure 41 page 216)

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Waikawa (Waikawa West 9a and 9b)** | Waikawa at Huritini | ✗[124] | ✗[124] | - | - | - | - | - | - | 100% | Yes |
| **Coastal Rangitikei (Rang_4)** | Coastal Rangitikei | Border line [125] | Border line[125] | - | ✓[125] | ✗[125] | ✗[125] | ✗[114] | ✗[115] | 94.8% | Yes |
| | Coastal Rangitikei Tributaries | ✗[125] | ✗[125] | - | ✗[125] | ✗[125] | ✗[125] | ✗[126] | ✗[126] | | Yes |

## Lake Catchments

| **Catchment name** | **Subzone name** | **N[127]** | **P[128]** | **Tropic level[129]** | **% over allocated[129]** | **Expert conferencing Ecologists (require management)[130]** |
|---|---|---|---|---|---|---|
| **Other south west catchments (West 7 and Lake Papaitonga)** | Waitarere (west 7) | - | - | - | - | The question of whether or not management is required needs to be revisited once modelling has been undertaken |
| | Papaitonga (west_8) | ✗ | ✗ | Supertrophic | 132% | Yes |
| **Other coastal lakes (West_4, West_5,** | Kaitoki Lakes (west_4) | ✗ | ✗ | Hypertrophic | 106% - 159% | Yes |

[124] Roygard, McArthur, Clark (2012) Figure 31, page 68
[125] Dr Ausseil (2012) Table 6, paragraphs 7.11 – 7.19
[126] Associate Professor Death (2012) Figure 10, page 33
[127] D Kelly (2012) Table 3 and Figure 3, pages 20 and 28
[128] D Kelly (2012)Table 2, page 18
[129] McArthur (2009) table 29, page 218
[130] Expert conferencing statement Ecologists 22 March 2012

| | | | | | | |
|---|---|---|---|---|---|---|
| **Northern Manawatu Lakes West_6** | | | | | | |
| | Kohata (west_4) | - | - | - | - | The question of whether or not management is required needs to be revisited once modelling has been undertaken |
| | Wanganui lakes (west_5) | ✗[127,131] | ✗ | Supertrophic to hypertrophic | 133 – 177% | Yes |
| | Northern Manawatu Lakes (west_6) | - | - | - | - | Some yes (CJ, RD, DK, MG, KM) from observation<br><br>The question of whether or not management is required needs to be revisited once modelling has been undertaken |
| **Lake Horowhenua (hoki_1a and 1b)** | Lake Horowhenua | ✗ | ✗[132] | Hypertrophic | 169% | Yes |

[131] McArthur (2009) TEB, V9, pg 4400 – page 228
[132] McArthur (2009) page 198

### 2.4.4 Appendix 4

**Summary of best management practices for reducing non-point source pollution from land use**

This table is based on Appendix A from technical conferencing statement[133] and identifies the provisions of the plan which incorporate the best management practice (where applicable) and where the practice is to be incorporated by Rule 13-1 etc.

| Contaminant | Source of pollution | Management practices to minimise pollution | How addressed in POP (Rule or method reference) |
|---|---|---|---|
| Nitrogen (N), Phosphorous (P), Faecal (F), Sediment (S) | Nutrient runoff/ leaching<br><br>Effluent runoff<br><br>Sediment run off<br><br>Stock | Nutrient and or contaminant management plan/ Whole farm nutrient management plans | To be addressed by non-point source provisions |
| | | Ensure BMP assumed under OVERSEER are met | To be addressed by non-point source provisions |
| N | Fertiliser, stock urine | Nitrification inhibitors | Can form part of NMP as part of non-point source provisions |

[133] Record of Technical Conferencing on LUC/Best Practice Sub-Topic in relation to Surface Water Quality – Non Point Source Discharges (23 March 2012)

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| N | Nitrogen fertiliser | Avoid applying nitrogen when soil temperatures at 10mm are <6C<br><br>Avoid applying nitrogen fertiliser when soil moisture content is below 25% of plan available or above field capacity<br><br>1 and 2 above especially important during Autumn (March/April)<br><br>Avoid applying nitrogen fertiliser to compacted soils<br><br>Avoid applying nitrogen fertiliser during winter (May – July)<br><br>Do not apply more than 50kg/ha at any one time<br><br>Do not apply more than 150kg/ha/yr unless a cut and carry system | |
| | | Avoid direct application to water | Rule 13-2 Condition (ba) |
| P | Fertiliser | Use low soluble P fertilisers where and when loss risk is high<br><br>Soil Olsen P kept to biological optimum for production | Can form part of NMP as part of non-point source provisions |
| N | Supplementary feed storage | Ensure grass silage properly wilted prior to stacking | Can form part of NMP as part of non-point source provisions |
| | | Avoid surface or ground water infiltration | Rule 13-3 Condition (a) |
| N, P, F, S | Stock | Reduce stocking rate | Can form part of NMP as part of non-point source |

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| | | | provisions |
| N | Stock urine | Diet manipulation<br><br>Controlled grazing<br><br>Integration of Low protein feeds<br><br>Cut and carry<br><br>Use salt blocks | Can form part of NMP as part of non-point source provisions |
| N,P,S,F | Effluent runoff from drains, farm tracks, stock crossing points | Avoid effluent run off to surface water from tracks, raceways, culverts, bridges<br><br>Ensure scrapped effluent off raceways, feedpads etc is stockpiled on a sealed surface<br><br>Do not put feedpads on river beaches/berms | Rule 13-6 and Rule 13-3 |
| | | Fence stock back from waterbodies (include riparian margin) | To be addressed by non-point source provisions – stock access |
| N, P , F, S | Animal effluent | **Farm dairy effluent management**<br><br>Only apply irrigated effluent when soil moisture below field capacity (deferred irrigation)<br><br>Effectively seal effluent storage facilities<br><br>Avoid irrigator application depth .10mm on high risk soils<br><br>Nitrogen not to exceed 50kg/ha/per application | Rule 13-6 |

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| | | **Manipulating timing and placement of excretal deposition**<br><br>Graze cows off farm during autumn and winter<br><br>Herd homes/ wintering barns<br><br>Feed pads | Can form part of NMP as part of non-point source provisions |
| N,P,S | Fodder crop | **Fodder crop management**<br><br>Avoidance of winter fodder cropping<br><br>Re sow summer fodder crop blocks by late summer/ early autumn<br><br>Establish appropriate vegetated riparian buffer zone eg ungrazed grass sward buffer between cultivated land and any waterway<br><br>Avoid 'camping' stock on fodder crops | Can form part of NMP as part of non-point source provisions |
| | | Cultivate following contours on slopes (do not cultivate up and down slopes)<br><br>Establish appropriate riparian setback distances from waterbodies when cultivating<br><br>Avoid cultivating/sowing drains, wet gullies<br><br>Avoid cultivating steep slopes or/and erodible land | To be addressed by cultivation rules in Chapter 12 |

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| N, P, F, S | Stock access to riparian margins and waterbodies | Exclude stock from streams, riparian zones, and wetlands | To be addressed by non-point source provisions – stock access |
| | | Establish riparian buffer zones (combination of vegetated and ungrazed grass) | Can form part of NMP as part of non-point source provisions |
| N, P, F, S | Surface water runoff / gullys | Create wetlands (nutrient soaks) as nutrient and sediment attenuation zones | Can form part of NMP as part of non-point source provisions |
| Sediment | Erosion and sediment runoff | Establish appropriate riparian buffer margins<br><br>Exclude stock from riparian margins<br><br>Exclude stock from waterbodies<br><br>Bridge or culvert stock waterbody crossing points – ensure runoff is directed away from surface waterbodies | To be addressed by non-point source provisions – stock access |

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| | | Establish appropriate riparian setback distances for land disturbance activities including tracking, cultivation, fodder crops, vegetation clearance | To be addressed by cultivation rules in Chapter 12 |
| Sediment | Hill country erosion | Management of land disturbance/earthworks/ cultivation/ and vegetation clearance<br><br>Plant trees | Addressed by Chapters 5 and rules in Chapter 12 |