Staff reply report

Hearings for the Proposed Regional Plan for Northland

November 2018

Date: 26/10/2018
Author: Northland Regional Council
Version: Final

Northland REGIONAL COUNCIL

Table of contents

Purpose of the report

1. The purpose of this report is for council staff to:

   - Provide a response to requests by the hearing panel raised during the hearing on the Proposed Regional Plan for Northland (the Plan)
   - Provide a response to any material presented at the hearing[1] that staff believe the hearing panel would benefit from having a staff response.
   - Outline recommended changes in response to material presented at the hearing.

2. The report is broken up into sections based on the S42A reports.

3. The recommended wording changes are generally not set out in this report – they are set out in the document *Reply Report Tracked Changes Version of the Plan*.

General approach

Author: Ben Lee

Hearing panel requests

Provide the Panel with a copy of the definition of "property" (or the like) from other regional plans, particularly the ECan LWRP, Southland's WLP (which defines 'landholding' instead of property) and Hawke's Bay RRMP.

4. The following are various definitions of "property in regional plans:

Proposed Regional Plan for Northland[2]	*One or more allotments contained in a single certificate of title, and also includes all adjacent land that is in the same ownership but contained in separate certificates of title.*
Canterbury Land and water Regional Plan	*means any contiguous area of land, including land separated by a road or river, held in one or more than one ownership, that is utilised as a single operating unit, and may include one or more certificates of title*

[1] This includes verbal prersentations, evidence, legal submissions and statements presented at the hearing

[2] Staff did not recommend any change to the definition in their S42A report

Proposed Southland Water and Land Plan	*Landholding* *(a) Any area of land, including land separated by a road or river or modified watercourse, held in one or more than one ownership, that is utilised as a single operating unit, and may include one or more certificates of title; except* *(b) For land with a residential, commercial, industrial, infrastructural or recreational zoning or designation in the relevant district plan means any area of land comprised wholly of one Certificate of Title or any Allotment as defined by Section 218 of the RMA.* *Note: for the purposes of this definition, a "single operating unit" may include, but is not limited by, the following features:* *(a) It has effective control by any structure of ownership of the same group of people (for example, land that is controlled by a family trust, or beneficiaries of that family trust or a related group of companies, or an estate, or partner, or individual/s or a combination of); and* *(b) It is operated as a single business entity.*
Hawke's Bay Regional resource Management Plan	*Refers to one or more allotments as contained in a single certificate of title, and also includes all adjacent land that is in the same ownership.*
Waikato Regional Plan	*For the purposes of Chapter 3.3 and 3.4 means one or more allotments contained in single certificate of title, and also includes all adjacent land that is in the same ownership but contained in separate certificates of title.*
Proposed Natural Resources Plan for the Wellington Region	*Any contiguous area of land or freehold title in one ownership.*
Gisborne Proposed Regional Freshwater Plan	*Any contiguous area of land, including land separated by a road or river, held in one or more than one ownership, that is utilised as a single operating unit, and may include one or more certificates of title.*

5. The NES Plantation Forestry defines "boundary of a property" (Clause 100) as:

> *includes the legal boundary of property on which the plantation forestry activity occurs and any other properties adjoining that property under the same ownership or management*

6. Having considered the various other definitions, I am still comfortable with the notified version, but I think some improvements could be made along lines of the wording in the NES Plantation Forestry:

One or more allotments contained in a single certificate of title, and also includes all ~~adjacent~~ <u>adjoining</u> land <u>under</u> ~~that is in~~ the same ownership <u>or management</u>, but contained in separate certificates of title.

Staff to please provide a definition of "good management practice" that is understandable to a lay person

7. The Land and Water Forum defines good management practice (GMP) as:

> *GMP refers to the evolving suite of tools or practical measures that could be put in place at a land user, sector and industry level to assist in achieving community agreed outcomes.*

8. The Regional Policy Statement for Northland has the same definition.

9. If the hearing panel were of a mind to maintain consistency with the RPS, then I recommend adopting the RPS definition. However, the Plan is not obliged to have the same definition as the RPS.

10. My recommendation for a definition of GMP understandable to a lay person is:

> *"A set of tools or practical measures promoted by an industry, sector or council to help minimise the effects of activities on the environment."*

11. I recommend the addition of this definition. There is currently no definition for GMP in the plan and it is not necessarily an obvious concept for lay people. It is referred to in nine places in the Plan - all in section D Policies.

Response to other matters and recommended changes

Rivers

12. I recommend changing "permanently flowing rivers" to "continually flowing rivers" - to be consistent with the RMA definition of "river":

> ***river** means a <u>continually</u> or intermittently flowing body of fresh water; and includes a stream and modified watercourse; but does not include any artificial watercourse (including an irrigation canal, water supply race, canal for the supply of water for electricity power generation, and farm drainage canal)* (underlining added for emphasis)

13. I also recommend the inclusion of "continually or intermittently flowing" preceding all references to "river" (where relevant) to avoid any risk that ephemeral streams could be interpreted as being included.

14. Both these changes are clarifications (alterations and corrections of minor effect made under Schedule 1 clause 16(2) of the RMA and the general decision-making powers of clause 10, Schedule 1, RMA).

'Catch all' rules

15. In the 'catch all' rules (rules that activities default to if not covered by a specific rule) the Plan uses an approach of listing rules – see for example rule C.1.3.14. For brevity, we recommend that the specific references be removed and words to the effect of "*...that is not a permitted, controlled or restricted discretionary activity in section XYZ of this Plan..."* be used (with the activity classes listed tailored to the situation). The other benefit of this approach is it avoids the risk of inadvertently missing a rule from the list.

16. However, this approach has not been recommended in all situations. It may be the case that is necessary to reference specific rules, for example where the catch-all rule relates to a subset of activities that sit within a broader set of rules.

Adaptive management policy

17. In his evidence for Fonterra, Gerard Willis[3] recommends the inclusion of a new policy for adaptive management. In response to a Hearing Panel request Mr Willis also provided a proposed definition of adaptive management.

18. I agree with Mr Willis that adaptive management is a legitimate approach to be taken where there is uncertainty. There is no guidance in higher level policy on adaptive management. I therefore recommend the inclusion of a policy based on Mr Willis' proposed wording. I have not recommended the inclusion of a definition for adaptive management as the term is only used (outside the proposed new policy) in one other policy, and instead I recommend a footnote in the proposed new policy.

[3] Paragraphs 5.15 to 5.17.

Policy D.2.4 – Resource consent duration

19. I have recommended a range of amendments to this policy which are explained in the following table:

Recommended change	Comment
When determining the expiry date for a resource consent, particular regard must be had to:	Clarification
1) ~~the~~ security of tenure for investment (the larger the investment, then generally the[4] longer the consent duration), and	Clarification – not always the case that the need for longer consent duration increases with the level of investment. May be situations where a longer consent duration may be justified for a small level of investment
2) the administrative benefits of[(23)] aligning the expiry date with other resource consents for the same activity in the surrounding area or catchment, and[5]	I suggested in my S42A report that benefits were administrative (e.g. to manage reconsenting large numbers of consents for the same activity) and environmental (e.g. to address cumulative effects). Upon consideration of the evidence (e.g. G Willis) I am now of the view that there is unlikely to be any environmental benefit of aligning consent durations as there is no legal way for council to require the processing and decision making of multiple resource consent applications at the same time. G Willis[6] suggested it be made clear that this clause applies to the same activities – I agree as that is the intent.
~~3) the reasonably foreseeable demands for the resource (the greater the foreseeable demands, the shorter the consent duration), and~~[7]	I am swayed by the argument (e.g. in G Willis' evidence) that applying this clause would be too speculative and uncertain.

[4] Clarification
[5] Fonterra, Willis, 5.14
[6] Evidence for Fonterra, parag 5.1 to 5.17.
[7] Fonterra, Willis 5.13

Recommended change	Comment
4) certainty of effects (the less certain the effects, the shorter the consent duration), and	No change
5) ~~the extent of any existing investment (the larger the investment, the longer the consent duration), and~~[(24)]	Duplicates 1).
6) whether the activity is associated with Regionally Significant Infrastructure (generally longer consent durations for ~~activities associated with~~ Regionally Significant Infrastructure),[(25)] and	May be situations where a longer consent duration may not be justified.
7) the following additional matters where the resource consent application is to re-consent an activity: a) the applicant's past compliance with the conditions of any previous resource consent or relevant industry guidelines or codes of practice (~~the greater the compliance, the longer the consent duration~~ significant previous non-compliance should generally result in a shorter duration), and[(26)] ~~b) the applicant's compliance with relevant guidelines and/or codes of practice (the greater the compliance, the longer the consent duration), and~~ c) the applicant's adoption of good management practice (~~longer consent duration for~~ the adoption of good management practices that minimise adverse environmental effects may	Upon reflection, 7) a) was too open and should be constrained to significant non-compliance (not just any non-compliance). 7)b) has been incorporated into 7)a). The proposed changes to 7)c) make it clear that the relevant aspect of the good management practice is minimisation of adverse effects.

Recommended change	Comment
result in a longer consent duration).[28]	

Marsden Point Port Zone

20. In her evidence, Bridgette Munro (Refining NZ) argued that the Marsden Point Port Zone recommended by Michael Day be extended onto land and incorporate all of Refining NZ's and Northport's operations (starting parag 6.20). I do not agree.

21. Michael Day's rationale in support of the Marsden Point Port Zone was:

> *I acknowledge that the activities of Northport and Refining NZ are classified as regionally significant infrastructure under Appendix 3 of the Regional Policy Statement for Northland (RPS) and that the RPS has recognised the regional importance of such infrastructure through specific objectives and policy guidance. I accept that the activities occurring in the coastal marine area at Marsden Point (because of their commercial, transportation and infrastructure functions, including New Zealand's only oil refinery) are greater in scale than other ports and wharves in the region, yet they are zoned the same. For example, Northport is currently zoned the same as Totara North wharf (both coastal commercial), yet the scale of activities are significantly different.*

(Paragraph 46, S42A report – Coastal structures)

22. This is my summary of Bridgette Munro's reasoning for extending the zone onto land:

23. Regardless of whether they are on land on in the CMA the activities undertaken by Refining NZ and Northport are necessary for their operations.

24. Similar approaches have been adopted in other plans (e.g. Gisborne's Tairawhiti Resource Management Plan and the Auckland Unitary Plan).

25. It would be a holistic and integrated approach to the management of regionally significant infrastructure and better recognises the unique and beneficial activities the operations provide.

26. In their original submission Refining NZ argued for an outline plan approach for their activities in the CMA and on land – which I interpreted as separate Refining NZ rules section. I think the reasons I had for not supporting the Refining NZ rules section apply equally to the extension of the Marden Point Port Zone on to land – they are not particularly unique (on land) and it comes down to plan structure.

27. To me there is a clear difference between Refining NZ and Northport's activities in the CMA and the activities undertaken on land. In the CMA they are the only regionally significant infrastructure – on land there are many.

28. The Marsden Point Port Zone has been proposed as a way of presenting provisions that are specific to the large commercial port operations of Refining NZ and Northport. For example, staff propose a new rule making new structures in the Marsden Point Port Zone a restricted discretionary activity where it would otherwise be a discretionary activity.

29. Turning to the arguments presented by Bridgette Munro, I do not understand the first point as all activities associated with a particular operation are necessary for that operation. Regarding the examples from other plans, the two examples provided are unitary authorities and from my examination of the port zones referred to, they do not contain 'regional'[8] rules on land i.e. the only land-based rules appear to be land-use rules. Lastly, I do not understand how having a land-based zone would achieve better integration as Ms Munro does not provide evidence to illustrate this.

Acid Sulphate Soils

Author: Jon Trewin

Hearing panel requests

30. None

Response to other matters and recommended changes

31. None

[8] Rules that can be included in a regional plan.

Agrichemicals

Author: Michael Payne

Hearing panel requests

Please clarify what the District Plan zoning is for the property at 372 Te Ahu Ahu Road and the surrounding area. Relates to agrichemical spraying of potato crops at Waimate North.

32. The Far North District Plan zones the property at 372 Te Ahu Road as "Rural Production Zone". Land to the south of Te Ahu Ahu Road is Zoned "Waimate North Zone."

33. The Far North District Plan describes the "Rural Production Zone" as:

> *The zone contains environmental and amenity standards which will enable the continuation of the wide range of existing and future activities, compatible with normal farming and forestry activities, and with rural lifestyle and residential uses, while ensuring that the natural and physical resources of the rural area are managed sustainably. Activities that are ancillary to farming or forestry may also have a functional need to be within the rural environment, however, such rural processing and servicing activities may be less compatible in more intensively settled locations. The standards in the Rural Production Zone are also aimed at enabling farming and activities ancillary to rural production whilst maintaining and enhancing amenity values associated with the rural environment, and at minimising the likelihood and risk of incompatible land uses establishing in proximity to each other.*

34. The Far North District Plan describes the "Waimate North Zone" as:

> *Whilst rural in nature, the Waimate North Zone (refer to Appendix 6C and Zone Maps) is unique. It is an area with both distinctive physical features and a legacy of Maori and European settlement. The result of human occupation of the land, particularly since the mid 1800's, has been the development of a landscape that has heritage value and outstanding visual qualities. This is expressed in the present-day roading pattern, the buildings and other historic and cultural elements, the settlement pattern, characterized by low-density lifestyle blocks, and the park-like rural character in which puriri and other indigenous and exotic specimen trees are a significant part.*
>
> *The visual quality of the existing environment of Waimate North Zone has been developed over many years by landowners in the area. Their efforts have benefited the whole District and need to be supported if the outstanding character of the landscape is to be retained or enhanced. For this reason, while retaining some consistency with the standards applying to the Rural Production Zone, special zone provisions have been inserted in the Plan that contain specific measures designed to assist landowners to protect and enhance the historic and visual character of the area.*

Please provide the panel with a copy of New Zealand Standard: 8409:2004 Management as referred to in rule C.6.5.1

35. Staff will provide a hard copy of NZS8409:2004 to the Hearing Panel when the Hearing reconvenes on 6 November. Unfortunately, staff cannot circulate an electronic copy of this standard as Council does not own the appropriate licence.

Response to other matters and recommended changes

Definition - Agrichemical

36. In her evidence Ms Wharfe discuses the definition of agrichemical[9] . I accept that definition from NZS8409:2004 has been used widely (with some minor changes) in regional plans throughout New Zealand. I believe the Proposed Regional Plan for Northland should be consistent with the definitions of other councils, where possible. I recommend that the changes suggested in Ms Wharfe's evidence[10] are adopted by the Hearing Panel.

Definition - Contractor (in relation to agrichemicl applicaiton)

37. Ms Wharfe[11] recommends minor changes to the definition to "contractor" . In my opinion, the suggested changes are logical. I recommend that they are adopted by the Hearing Panel.

Definition - Vertebrate toxic agent

38. I accept that the definition of Vertebrate Toxic Agent should be amended for the reasons set out in evidence provided by Mr Fairweather for the Minister of Conservation[12]. This definition has been inserted into *Reply Report Tracked Changes Version of the Plan* for the Hearing Panels consideration.

Definition - Public amenity area

39. In his evidence Graeme Silver (para 22) sets out amendments to the definition of *public amenity area.* In my opinion, the amendments sought by Mr Silver improve the definition and provide greater clarify regarding what is meant by the term public

[9] Horticuture New Zealand, Wharfe paras 8.11-8.16
[10] Horticulture NZ, Wharfe para 8.16
[11] Horticulture NZ, Wharfe, Para 8.22
[12] Minister of Conservation. Fairweather, Paras 48-50.

amenity area. The improved definition also allows rules C.6.5.1 and C.6.5.2 to be simplified. These rules include examples of public amenity areas. These examples are unnessecary in the rules if the relief sought by Mr Silver is adopted.

40. I recommend that the definition of public amenity area as sought by Mr Silver is adopted and consequential amendments are made to C.6.5.1(2)(e) and C.6.5.2(8).

Notification requirements

Notification timeframes

41. Hancock Forestry Management and Rayonier New Zealand have requested that the upper limit for notification, currently two weeks, is increased to one month. The reason given by the submitters to support the change are;

> *spraying times can change quickly due to changing weather. Requiring notification, no more than two weeks before the spraying activity requires land owners/ managers to, at times, carry out multiple notifications.*

42. During the hearing representitives from Hancock Forestry Management discussed the issues they face in respect to notifiaction of neighbours over large areas of forest and at times notification must be given for operations in multiple forests. I acknowledge that the issues they identified in respect to notification can be difficult for them to manage and present an issue in respect to undertaking their business in a free and flexible manner.

43. Submissions from Cinna Smith and L & D Wheeler also commented on notification requirements. These submitters are neighbours of a horticultural operator who regularly applies agrichemicals on land adjacent to their homes. Given that these submitters also adovcate for a maximum 1 month notification timeframe, I am pursuaded that the proposal by Hancock Forestry Management and Rayonier New Zealand is reasonable .

44. Based on the evidence presented in submissions and at the hearing. I recommend that the rule C.6.5 be amended to provide for notification up to one month before spraying takes place.

45. When considering amendments to the notification provisions for agrichemical application, particularly for the minimum time neigbours can be notified before spraying commences, I think it is important to bear in mind the reasons why previous plans and the Proposed Regional Plan require notification. One of the key reasons for

notification is to make neighbours aware that spraying is going to take place and to give them time to prepare incase agrichemical spray drifts across the property boundary. Neighbours may wish to disconnect downpipes used to collect drinking water, cover or move sensitive plants or move stock. In order for notification to be meaningful, the notification timeframe must allow neighbours a reasonable amount of time to undertake these tasks.

46. Submissions from Cinna Smith and L & D Wheeler seek that the minimum notification time is increased from 24 hours to 7 days before spraying takes place.

47. Horticulture New Zealand seeks that the minimum notification timeframe is decreased to 12 hours.

48. In my opinion, 12 hours notice does not provide a reasonable amount of time for residents to prepare for potiential spray drift. Particularly in the winter when 12 hours notice given in the evening ,during the winter, would not allow the neghbour any daylight hours to prepare .i.e. 6pm notification for a 6am spray time.

49. I am also cognisant of Hoticulture New Zealands point that agrichemical applicators rely on accurate weather forcasts and that weather forecasts are no particularly accurate days in advance. Multiple notifications due to poor weather can be an annoyance for neighbours and are a cost to businesses. I therefore do not support the minimum 7 days notice sought by Cinna Smith and L & D Wheeler.

50. I standby my recommendation made in the 42a report[13] of a minimum notification time of 24 hours.

51. If the Hearing Pannel are of a mind to reduce this timeframe I feel that a minimum notification timeframe of 18 hours notification would strike a better balance than the 12 hours notification, in respect to confidence in weather conditions while allowing time for neighbours to prepare. It is worth noting that 18 hours notification is required by the Air Quality Plan for Northland.

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[13] Agrichemicals - Recommendations in response to submissions on the Proposed Regional Plan for Northland - Section 42A hearing report. July 2018.

Notification distance

52. Based on the evidence provided by Northland District Health Board and Wheeler D I recommend increasing the notification distance for handheld and ground-based application from 30m to 50m.

53. In respect to the notification distance for schools. I have not seen any evidence that convinces me that notification is necessary for schools over and above the standard 50m notification distance discussed above.

Notification requirements can be amended by agreement

54. The agrichemical rules require agrichemical applicators to notify neighbours in certain circumstances. Rules C.6.5.1(d) and C.6.5.2(e) allow the notification requirements to be amended. While I believe this these conditions take a pragmatic approach to notification the courts have determined that have determined that permitted activities cannot allow for third party approval. Councils cannot retain later discretion through permitted activity rules. C.6.5.1(d) and C.6.5.2(e) are therefore not valid permitted activity conditions and I recommend that they are deleted.

Roadside spraying

55. In their evidence Town and Country Spraying Limited discuss how the requirement to display signage at the beginning and end of an area of roadside being sprayed would work in practice. Based on the evidence provided, I accept that a condition of this nature is impractical. I therefore recommend that C.6.5.1(1)(f)(i) and C.6.5.2 (8)(a) be deleted.

Qualifications

56. Submission from the Minister of Conservation and Horticulture New Zealand commented on the requirements for Growsafe certification in rules C.6.5.1 and C.6.5.2.

57. Horticulture New Zealand supports references to Growsafe certification within the agrichemical rules which is made clear in the evidence of Ms Wharfe[14] .

[14] Horticulture New Zealand, Wharfe. Paras 8.50-8.85

58. The Minister of Conservation seeks that reference to Growsafe certification are delete for the following reasons:

> *All Requirements to Growsafe are not required and serve no resource management purpose. The safe application of agrichemicals is regulated under the Hazardous Substances and New Organisms Act 1996). HSNO requires 'approved handler' status where an agrichemical is applied by a contractor, toxic to humans, corrosive, used over and into water, is ecotoxic or is to be used in a widely dispersive manner.*
>
> *It is also noted that there are requirements under health and safety legislation that require people to be competent in the use of agrichemicals.*

59. I am convinced by the evidence by Ms Wharfe[15] on this matter. I agree that there is benefit in referring to Growsafe qualifications in rules C.6.5.1 and C.6.5.2. I also note that in response to questions from the Hearing Panel Mr Havell indicated that including a reference to Growsafe Certification or equivalent would satisfy the concerns expressed by the Minister of Conservation. I recommend amendments to C.6.5.1 and C.6.5.2. as shown in *Reply Report Tracked Changes Version of the Plan*.

Spray plans

60. I am convinced by the evidence by Ms Wharfe[16] on this matter. I agree that there is benefit in referring to Growsafe qualifications in rules C.6.5.1 and C.6.5.2. I also note that in response to questions from the Hearing Panel Mr Havell indicated that including a reference to Growsafe Certification or equivalent would satisfy the concerns expressed by the Minister of Conservation. I recommend amendments to C.6.5.1 and C.6.5.2. as shown in *Reply Report Tracked Changes Version of the Plan*.

61. Submitters from Waimate North[17] sought a number of changes, including mandatory spray plans and changes to the notification requirements to manage the risk of agrichemical spray drift. In response I made the following comments in the 42A report[18]:

> *In respect to the submissions seeking mandatory spray plans. The Proposed Plan requires sprayers to meet the requirements of NZS 8409:2004– Management of Agrichemicals (the Standard). This standard requires sprayers to prepare an annual spray plan and notify*

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[15] Horticulture New Zealand, Wharfe. Paras 8.50-8.85
[16] Horticulture New Zealand, Wharfe. Paras 8.50-8.85
[17] Cinna Smith and L & D Wheeler et.al

[18] Agrichemicals - Recommendations in response to submissions on the Proposed Regional Plan for Northland - Section 42A hearing report. July 2018.

anyone likely to be affected by spray application that a spray plan has been prepared and is available on request (NZS8409:2004 clause 5.3.2).

While the Proposed Plan already requires spray plans to be available to affected parties via a reference to the Standard[7] I see some benefit in including a clause requiring spray plans to be provided to the regional council on request.

62. A number of the changes sought by the Waimate North submitters are good practices that are discussed in the New Zealand Standard Management of Agrichemicals (NZS8409:2004). The Proposed Plan required compliance with those good practices through a reference to the applicable sections of the standard. My earlier recommendation was to reject those submission points.

63. Having considered this matter further and having heard evidence during the hearing I believe it is worthwhile making it explicit that spray plans are mandatory and that measures must be taken to manage the risk of off-target agrichemical spray drift. To that end I have proposed amendments to rules C.5.1.1(Application of agrichemicals) and C.5.1.2(Application of agrichemicals into water) in *Reply Report Tracked Changes Version of the Plan* for the Hearing Panels consideration. These amendments are drawn from the Auckland Unitary Plan and are supported in principle by Horticulture New Zealand[19].

2,4- D

64. The Hearing Panel raised the following question for staff in response to the 42A report on Agrichemicals[20]:

Appendix A, page 19 – Alspach, R. submission re limiting aerial spraying of 2, 4-D at specific times of the year. Given the current plan (RAQP) includes specific calendar restrictions, namely ground and aerial spraying outside winter months due to higher volatility in different weather conditions, and the HSNO rules do not specify calendar restrictions for this chemical, can the report author please explain why the HSNO rules are considered to be adequate?

[19]Horticulture supports the principle and content of the amendments but have not seen the wording.
[20] Michael Payne for Northland Regional Council, 17 August 2018. *Agrichemicals - Recommendations in response to submissions on the Proposed Regional Plan for Northland - Section 42A hearing report .*

65. I provided the following response on 17 August 2018:

> *Following the release of the 42A reports I have had several discussions with the EPA on 2,4 – D. As a result of those discussions, I am increasingly of the view a rule, like that sought by Mr Alspach, is warranted.*
>
> *Rule 10.1.6 of the operative Air Quality Plan focuses on 2,4 – D Ester. This is only one of many products containing 2,4 – D. Products containing 2,4 – D come in a range of chemical formulations and have different degrees of volatility. A number of these products have similar levels of volatility to 2,4 – D Ester. If a rule is included in the proposed plan managing this risk. I recommend that it covers a range of 2,4 – D products rather than focusing on 2,4 – D Ester. Staff will continue to work on a rule to manage the risks of agrichemicals containing 2,4 – D migrating offsite which will be presented to the Hearing Panel either in the opening statements or in the officer's reply*

66. I have drafted an additional clause (C.6.5.1(4)) to give effect to the recommendation I made on 17 August.

Application in the Coastal Marine Area and coastal water

67. In their original evidence the Minister of Conservation sought amendments to allow for the application of agrichemicals to coastal water to manage pest species. Mr Havell provided additional information on this matter in paragraphs 12 –16 of his evidence. Based on the evidence provided by Mr Havell, I accept that there is a need to provide for agrichemical application to water in the coastal marine area to manage pest species. In my opinion, the wording provided by Mr Silver, on behalf of the Minister of Conservation, strikes an appropriate balance between protecting indigenous ecosystems from the adverse effects of agrichemicals and allowing the use of agrichemicals to control pest species.

68. In addition, I would like to draw the panel's attention to the disparity in the way the Proposed Plan manages agrichemical application in the CMA. While the Proposed Plan takes a restrictive approach to the direct discharge of agrichemicals to coastal water, it takes a relatively permissive approach to the discharge of agrichemicals to the intertidal zone (when the tide is out). When the tide is out, agrichemical application to the intertidal zone can be undertaken as a permitted activity under Rule C.6.5.1 as there is no direct discharge to water. This approach does not recognise the sensitive nature of the intertidal zone in respect to the species that inhabit this zone or the fact that people often have unrestricted access.

69. In his evidence (para 16) Mr Havell discusses the risk of agrichemicals to people and the aquatic organisms.

Within Northland, DOC uses at least 9 general types of agrichemical, excluding adjuvants, dyes, and stickers as listed in Appendix 5. These range in ecotoxicity from very ecotoxic, (class 9a) to slightly harmful, (class 9d). Approximately 50% are very ecotoxic to aquatic organisms (9.1) and soil organism (9.2), some are known to be ecotoxic or harmful to terrestrial vertebrates (9.3). In terms of their impacts to humans, some are harmful, irritating to skin and eyes, and have respiratory effects. [21]

70. The disparity in how the intertidal zone is managed between high and low tides is an oversight. I believe there are reasonable grounds to introduce an additional clause to rule C.6.5.1 limiting the use of agrichemicals in the CMA unless it is for the purpose of controlling pest plants or exotic vegetation.

General

71. There are a number of instances where I believe minor changes should be made to the policies and rules for agrichemicals to improve readability and to make the language in this section consistent with similar terms and phrases uses in other parts of the Proposed Regional Plan.

Air Quality

Author: Michael Payne and Jon Trewin (Dust on Roads)

Hearing panel requests

Report "Northland Regional Council Pipiwai Continuous Ambient Air Quality Monitoring Monthly Summary Report, June 2018"– please clarify why the summary states that there are no exceedances of PM10, but on page 7, Table 4 there is a list of exceedances.

72. The list of exceedances on page 7, Table 4 relate to the entire period June 2017 – June 2018. The summary relates just to June 2018 where there were no exceedances. Exceedances typically occur in the summer months in drier conditions and this is borne out by the 2017/18 figures.

Staff to consider rule C.7.1.1 and whether it could accommodate the burning of broken fencing materials in rural areas, including tanalised fence posts.

[21] David Havell, 10 August 2018. *Statement of evidence of David Charles Havell on behalf of the Minister of Conservation*

73. If the hearing panel were of a mind to provide for the burning of fencing materials, including treated timber, amendments to rule C.7.1.1 would be the appropriate place to provide for this activity.

74. The discharge of contaminants to air and land from this activity falls within the functions of regional councils[22] and burning of fencing materials (wire, plastic components and treated timber) is not contrary to any national regulation. Council could therefore include rules in a regional plan managing this activity.

75. I acknowledge the problem of CCA treated timber to farmers, and accept that the volume of fencing materials that need to be managed is significant. I also acknowledge that burning these materials is likely to be the most convenient and cost-effective disposal method.

76. While Council could the permit burning of fencing materials, and there are clear benefits in doing this, we should also be mindful of the potential adverse effects.

77. The following paragraphs focus on the effects of burning copper chrome arsenate (CCA) treated timber as it is likely to form the bulk of the fencing material being burnt. Wire and plastic components such as high-density polythene insulators are also likely to be present but in much lower volumes.

78. Research has shown that burning CCA treated timber releases arsenic in air. Combustion of treated timber through open burning at lower temperatures, such as those generally found in outdoor burning, releases tri and tetra oxides of arsenic and gaseous inorganic and organic arsenic compounds such as arsine, which is most important for air quality.

79. Inorganic or organic arsenic compounds have the potential to affect human health. Human health effects range from irritation of skin and mucous membranes including dermatitis, conjunctivitis etc. to gastrointestinal effects, haemolysis and nervous system disorders. Acute exposure to arsine can be lethal. The U.S. EPA has classed inorganic arsenic as a group A carcinogen.

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[22] S30 (f) RMA

80. When combustion temperature is below 327 degrees Celsius, arsenic remains in the ash with copper and chromium.

81. Ash, and particulates including soot and smoke from fires is deposited on land (including buildings and sealed surfaces) and water in an area surrounding the fire that is difficult to quantify or predict without modelling. It can easily end up on neighbouring land and cannot be confined to a property by the person responsible for the burning. Deposition of ash and particles that are rich in arsenic on buildings with rainwater tanks creates a pathway (ingestion) for the arsenic to enter humans and livestock. Where arsenic ash enters water, arsenic hyperaccumulators, (plants that can extract a mineral from water at an exceedingly efficient rate and accumulate the mineral in various parts of the plant) and specifically watercress (Nasturtium officinale) bio-magnify the arsenic extracted from the water in the edible portions of the plant, again completing the ingestion pathway.

82. Partially burned wood and ash that remains on the fire pile is an extremely rich source of arsenic, in any of its forms, which either leaches into the soil or is incorporated in the soil by movement.

83. Within the last year Council has been alerted to at least 5 instances where land has been contaminated from burning treated timber to the extent that they needed remediation because they presented a risk to human and/ or environmental health. The cost of investigating, remediating and validating contaminated land would be orders of magnitude greater than the cost of landfilling the waste. When considering this issue Council staff discussed the matter with Vision Consulting Engineers, who are an engineering and environmental consulting firm based in the Far North District. Director, Ben Perry said that burning CCA treated timber is the number one cause of contaminated land that they work on, both in rural and residential settings.

84. To an extent, the effects discussed above could be limited by introducing conditions that restrict the volume of CCA treated timber that could be burnt as a permitted activity. However, this approach presents several difficulties in respect to monitoring and enforcing compliance which are well illustrated in the comments by James Mitchell, Hazardous Substances Specialist, Compliance Monitoring below.

> *Enforceability would be difficult, as we generally arrive at the scene once the fire has been extinguished or burning is complete. In order to determine the presence of arsenic beyond reasonable doubt (prosecution evidential standard) requires laboratory testing. It is difficult, if not impossible, to accurately extrapolate the volume of fuel that the ash represents.*

85. When considering whether Council should allow this activity, I reviewed 8 resource management plans from other regions. None of those plans permitted treated timber to be burnt in the open. These plans either treated this activity as a discretionary or prohibited activity.

86. It is worth noting that the Ministry for the Environment has signalled that amendments to the NES Air Quality, expected to be released for consultation in 2019, will include regulations that prohibit open burning of treated timber.

87. Bearing both the positive and negative effects of burning fencing materials in mind, I do not recommend amending rule C.7.1.1. to provide for burning of fencing materials as a permitted activity.

Response to other matters and recommended changes

Rule C.7.2.4 - Discharges to air from industrial and trade activities

88. Northland District Health Board (Wickham) request that 'the application of spray coating activities' be a discretionary activity rather than a permitted activity due to the presence of hazardous chemicals (volatile organic compounds) leading to off-site odour and health effects. In the Regional Air Quality Plan, the activity was permitted provided no more than 30L is used per day. A search of Council records found that there are five current consents held for solvent spray coating related activities – all at boatyards in Whangarei. These are all subject to consent under the current rules (i.e. more than 30L is being sprayed) and typically bundle this activity with consents for open-air dry abrasive blasting. I note the evidence produced by Wickham and whilst I cannot fault her expertise with regard to health effects, the fact that there are only five consents held suggest that most businesses probably use less than 30L a day.

89. I do not recommend requiring consent for all spray coating activities as this might capture very minor operations (for example panel beaters). I believe that the 30L is appropriate and could be reinstated (defaulting back to the Regional Air Quality Plan) – as this would only capture the largest operations as is currently the case.

90. The Hearings Panel might also want to consider including a rule for spraying in a booth as a 'half-way house' option which would negate the need to apply for consent if over 30L and in a self-contained facility, consistent with similar proposed rules for dry

abrasive blasting. Draft rules from the Wellington Natural Resource Plan and the Bay of Plenty Air Plan are included below for consideration:

Rule AQ.R29: Spray coating within a spray booth – permitted activity

The discharge of contaminants into air from the spray application of surface coatings containing diisocyanates or organic plasticisers within a spray booth is a permitted activity, provided the following conditions are met:

(a) the discharge shall not cause noxious, dangerous, offensive or objectionable odour, dust, particulate, smoke, vapours, droplets or ash beyond the boundary of the **property**, and

(b) there is no emission of **hazardous air pollutants** as identified in Schedule L2 (air pollutants) beyond the boundary of the **property**, and

(c) the spray booth is fitted with an air extraction system that vertically discharges all contaminants and exhaust air to a vent in accordance with the *A/NZS 4114.1:2003 Spray painting booths, designated spray painting areas and paint mixing rooms, Part 1: Design, construction and testing*, and

(d) the vent shall be 3m above the roof line of the building roof and shall discharge vertically, and

(e) the discharge is not impeded by any obstruction above the vent that decreases the vertical efflux velocity, and

(f) the discharge shall be filtered by an extraction system that removes more than 95% of particulate matter from the discharge. The filtration system shall be maintained to 95% efficiency at all times by a suitably qualified person at least once per annum, with a copy of the maintenance report held by the operator and available to the Wellington Regional Council on request.

Rule 17 – Use of commercial spraypainting products – Permitted

The discharge of contaminants to air from the spray application of surface coatings including those containing di-isocyanates or organic plasticisers is a permitted activity provided the following conditions are complied with:

(a) The spraying is carried out in a spray booth or room fitted with an air extraction system that discharges all contaminants and exhaust air to an emission stack.

(b) The emission stack must discharge vertically at least three metres above the ridge height of the building and not be fitted with a rain excluder or any other obstruction that decreases the exit velocity of the discharge from the stack.

(c) The discharge must be through a filtration system that removes at least 95% of particulate matter from the discharge and the filtration system must be maintained to ensure this particulate removal efficiency at all times.

(d) The discharge must not result in any harmful effects beyond the subject property.

(e) The discharge must not result in any offensive or objectionable odour, smoke, ash, or particulates beyond the subject property.

(f) The Bay of Plenty Regional Council must be notified of the location of the activity.

91. In addition, Tegel Ltd sought amendments to rule C.7.2.4 to provide for fumigation, poultry hatcheries and poultry feedmills. Based on the evidence provided by Tegel Limited, I am convinced that poultry hatcheries and poultry feedmills are similar in nature to other activities provided for in rule C.7.2.4 and that the amendments sought by Tegel Limited are appropriate.

92. However, the paucity of evidence provided on the nature of fumigant use in the poultry industry, the nature of discharges to the environment and any potential effects that result from fumigation within the industry means that I am unable to recommend including 'fumigation' as a permitted activity in the rule as sought by Tegel limited.

93. I also recommend deleting the words "having a dust producing capacity" from Clause 20. In my opinion, the movement and loading of material within a site should be a permitted activity. These are normal tasks for many operations and should be a permitted activity provided they do not have offensive or objectionable effects beyond the boundary. Clause 20, as it is currently worded, unhelpfully restricts the permitted activity to those loading and vehicle movements that have a dust producing capacity.

Policy D 3.1 (General approach to managing air quality)

94. I recommend several changes to this policy. One such change to 6) recognises that adverse effects across the boundary might include reverse sensitivity effects (from Lynette Wharfe's evidence for Hort NZ). Another is a new clause where there is a presumption of allowing air discharges from industrial and trade activity provided the BPO is adopted significant adverse effects are avoided (Fonterra from Willis' evidence). I also recommend several clarifications to text.

Policy D.3.3 (Dust and odour generating activities)

95. I recommend an exception to this policy in circumstances where an odourant is added to pipelines and safety equipment (based on First Gas' evidence) and there is a controlled discharge of gas.

Policy D.3.4 (Spray generating activities)

96. I recommend some minor clarifications to this policy including to clarify that the policy applies to agrichemical and surface coating spraying.

Policy D.3.5 (Marsden Point airshed)

97. I recommend a minor change based on evidence from Refining NZ to include a requirement for new discharges of sulphur dioxide to avoid adverse effects of regionally significant infrastructure in the Marsden Point Airshed.

Dust from unsealed roads

98. I have read the evidence provided by Whangarei District (Devine), Kaipara (Van Zyl) and Far North District Councils (Wylie/Crawford) and the proposed new wording for Rule C.7.2.5. This new proposed new wording includes the deletion of the current clause requiring a road controlling authority to have a current programme in place to control the effects of dust on sensitive areas and instead, two clauses requiring information to be provided to NRC on request on the NZ Transport Agency funding criteria applicable to the mitigation of dust as well as a list of sites where such funding has been sought.

99. The funding criteria applicable to the mitigation of dust is, at the time of writing, NZ Transport Agency General Circular Investment 16/04. The list of sites where funding has been sought is information held by district councils and was not publicly available until its inclusion in the most recent iteration of the Regional Land Transport Plan. This list includes information on the extent to which sites meet the funding criteria and proposed treatments. The list is a 'living document', likely to change over time.

100. The proposed rule wording, in my opinion, does provide some surety that dust hotspots will suitably be addressed however I believe the condition could be enhanced by including a full list of roads which have been assessed for dust against NZ Transport Agency criteria (whether they are eligible for NZ Transport Agency funding or not). In addition, for reasons of transparency, this list should be publicly available and up-to-date (i.e. published on district council websites). I therefore recommend an amendment to proposed Clause 2 to this effect. Clause 1 should be similar amended so that current NZ Transport Agency funding criteria is published on district council websites (or a link provided). Please refer to the Proposed Regional Plan Officer recommendations October 2018 for recommended wording.

C.7.1.1 Outdoor burning outside the Whangarei airshed

101. I agree with Fire and Emergency New Zealand (FENZ) that adding a note directing readers to obtain a permit from FENZ during an open fire season is beneficial. I have included a note in the *Reply Report Tracked Changes Version of the Plan* for the Panels consideration.

102. In addition, I recommend deleting clause c from rules C.7.1.1 and C.7.1.2. This clause is not appropriate for a permitted activity as it provides for third party approval.

C.7.1.3 Burning for fire training purposes

103. In light of the evidence provided by Ms Unthank[23] I support the amendments sought by Fire and Emergency New Zealand to the contents of rule C.7.1.3.

New rule – Flaring natural gas

104. I have considered the evidence provided by First Gas in their original submission and the further information provided in evidence by Mr Noonan. I accept that flaring of natural gas is normal and good practice within the industry. Based on this evidence I recommend that a new rule for flaring natural gas is adopted by the hearing panel, as set out on page 8 of Mr Noonan's evidence.

New rule – Venting natural gas

105. I accept the reasons set out in Mr Noonan's evidence [24] and recommend that the Hearing Panel adopt a new rule for venting natural gas from distribution and transmission networks as set out on page 8 of Mr Noonan's evidence.

C.7.1.5 Burning for energy (electricity and heat) generation less than 40kW

106. Northland District Health Board seek to exclude waste oil from the materials that can be burnt as a permitted activity under this rule. I agree with this change as it is consistent with similar rules elsewhere in the Proposed Plan and acknowledges that burning waste oil presents a greater risk to human health than unused oil.

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[23] Fire and Emergency New Zealand, Unthank, para 36
[24] First Gas, Noonan, Paras 27-30

C.7.1.7 Existing authorised burning for energy generation and C.7.2.6C Existing authorised air discharges from industrial and trade activities - restricted discretionary activity

107. Northland District Health Board sought a suite of changes to the rules for air quality including changes to the activity status of rules C.7.1.7 and new rule C.7.2.6C from restricted discretionary to discretionary.

108. In response to questions from the Hearing Panel Ms. Wickham provided alternative wording for the matters of control. While I do not agree that the activity status of these rules should change, as sought in the original submission by Northland District Health Board, I do agree with many of the changes suggested by Ms. Wickham in her response to the Hearing Panels question.

109. Mr Chilton[25] seeks amendments to the matters of discretion in both rules to refer to ambient air quality effects and the Ministry for the Environment's" Good practice guide for assessing discharges to air from industry, June 2008". I am convinced by the evidence provided by Mr. Chilton and recommend that this rule is amended accordingly.

110. The amendments recommended above have been included in *Reply Report Tracked Changes Version of the Plan*.

Appendix H.3 - Chimney heights

111. As previously indicated in the 42A report for Air Quality staff have been working with a consultant on amended chimney height requirements in response to submissions from Fonterra Ltd and the Bio Energy Association. This work is underway but is not complete at the time of writing this report.

112. Staff will provide the Hearing Panel with the consultant's report and the resulting amendments to the Proposed Plan when hearing reconvenes on 6 November.

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[25] Refining New Zealand, Chilton. Para 38

Allocation and use of water

Author: Ben Tait

Hearing panel requests

How many existing consents have conditions that fall outside of the default allocation limits? (to address Irrigation NZ's concern about not knowing the extent of any potential overallocation problem).

113. I understand that the Hearing Panel would like to better understand the current levels of water that has been consented to be taken (i.e., allocated) from Northland's surface and groundwater bodies, rather than the number of consents that provide, individually and cumulatively, for water to be taken beyond a 'default' allocation limit in the Proposed Plan.

114. The council has allocation maps that show (i.e., indicate) how much water is currently allocated to be taken from Northland's rivers and aquifers. The level of allocation is compared to the allocation limits in the Proposed Plan. The maps can be found here: https://www.nrc.govt.nz/your-council/council-projects/new-regional-plan/indicative-water-quantity-allocation-maps/

115. I have also attached to this report a map (Appendix 5) showing levels of existing consented allocation across Northland's river network relative to the 'default' allocation limits in the Proposed Plan (as at 11 September 2018). Also attached is a map showing rivers and river reaches with lower minimum flows than the default minimum flows set in the Proposed Plan because of existing consents (see Appendix 6).

116. Please note that the maps, in their current form, display the actual allocation at a reach level.

Can staff reconsider their proposed definition of a "non-consumptive take" considering clause 4 of the Resource Management (Measurement and Reporting of Water Takes) Regulations 2010? The panel encourages staff to discuss with Sharon Dines (Northpower) to see if a mutually agreed definition could be prepared.

117. Clause 4 of the Resource Management (Measurement and Reporting of Water Takes) Regulations 2010 provides that the "regulations do not apply to a water permit if the taking of water under the permit is non-consumptive in that (a) the same amount of water is returned to the same water body at or near the location from which it was

taken; and (b) there is no significant delay between the taking and returning of the water."

118. While it would be desirable to use the definition in the Resource Management Regulations, Sharon Dines and I consider that the definition does not provide sufficient clarity for a plan user and instead suggest retaining the definition that I proposed previously, albeit with some amendments as follows:

Non-consumptive take –

(1) *Where water is used but not taken ~~or diverted~~ from a water body, or*

(2) *Where water is taken ~~or diverted~~ from a water body and the same volume, minus any water lost by evaporation ~~or transpiration~~, is returned ~~immediately to the source at the point of take or diversion following its use~~:*

(a) to the same water body in the same sub-catchment as near as practicable to the point of abstraction or upstream of the point where the take is being assessed; and

(b) at the same time as or within a timeframe as near as practicable to when the take is operating

Can staff consider an approach for providing an allocation and criteria around use (such as not commencing until several days after a low flow cessation commences) for horticultural 'survival' water (e.g. for root stock), and to provide advice on using such an approach in the Northland Regional Plan?

119. Policy D.4.19 in the Proposed Plan provides for exceptions to minimum flows for rivers, which are set out in Policy D.4.14. Several submitters are seeking the deletion of the part of Policy D.4.19 that provides for takes below minimum flows for the sole purpose of preventing the death of permanent viticulture or horticulture crops.

120. The submitters include the Minister of Conservation, Northland Fish and Game and the Royal Forest and Bird Protection Society of New Zealand. They consider that minimum flows are 'absolute' freshwater quantity limits under the NPS-FM, and therefore cannot be breached.

121. Horticulture New Zealand, in its primary submission, sought that the Proposed Plan should set out the activities that have priority access to water during low flow conditions (i.e., during water shortage conditions). I understand that this would mean

water shortage directions pursuant to Section 329 of the RMA would be the primary methods for enforcing compliance with minimum flows and that horticultural survival water would be provided the same level of priority as stock drinking water and domestic supplies. I did not support a policy setting priority on the basis that I consider that the issuing of water shortage directions is an operational matter, not a planning matter, and that a degree of flexibility is required because of existing consent conditions relating to restrictions and cessation of water takes.

122. Vance Hodgson stated, on behalf of Horticulture New Zealand:[26]

> *The provision of horticultural survival water in times of drought (fettered by rationing and subject to section 329) is in my opinion a sound resource management response. The case for survival water to horticultural rootstock and water sensitive crops for human consumption is well established in regional plans around New Zealand.*
>
> *What is needed, irrespective of whether the allocation is to rootstock or other crops, is a clear methodology to determine the volume and duration. This has been considered by Nic Conland for HortNZ who proposes a new definition for Horticulture Protection Water as follows:*
>
> *Horticulture Protection Water*
>
> *When determining the catchment allocation for horticultural protection water the following to assessments are required:*
>
> *(a) The permanent horticultural crops in the catchment are currently allocated less than 20% of the 7D-MALF.*
>
> *(b) The use of horticultural protection water is limited to the water demand requirements to maintain rootstocks in drought conditions. Typically, this will be 25% of the irrigation demand,*
>
> *(c) The use of horticultural protection water occurs after 4 consecutive days below minimum flow conditions.*

123. Nic Conland's recommended definition is based on the findings of a technical assessment that he did with modelled data to look at theoretical conditions for the demand and use of horticultural water in two theoretical catchments.

124. Vance Hodgson also "propose[d] that D.4.19 could be amended as follows to link to Mr Conland's definition (as per s42A recommendations version):[27]

> *D.4.19*
>
> *Minimum flows and levels*

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[26] Statement of Evidence by Vance Andrew Hodgson for Horticulture New Zealand. 10 August 2018. Paragraphs 43, 45 and 47, pages 9 and 12.

[27] Statement of Evidence by Vance Andrew Hodgson for Horticulture New Zealand. 10 August 2018. Paragraph 48, page 13.

For the purposes of assisting with the achievement of Objective 1 of this plan, ensure that the minimum flows and levels in H.6 'Environmental flows and levels' apply to activities that require water permits pursuant to rules in this plan.

An application for a water permit that would allow fresh water to be taken, dammed or diverted when flows or levels are below a minimum flow or minimum level in H.6 'Environmental flows and levels' may be granted if:

1) the water is to be taken, dammed or diverted for:

a) the health of people as part of a registered drinking water supply, or

b) Horticulture Protection Water, being for the sole purpose of preventing the death of permanent viticulture or horticulture crops (excluding pasture species, animal fodder crops, and maize), or ...

125. The Hearing Panel asked council staff to consider the recommended approach, and other approaches,[28] for providing an allocation for use of water for horticultural 'survival' water below the default minimum flows (such as not commencing until several days after a low flow cessation commences), and to provide advice on using such an approach in the Northland Regional Plan. In other words, the Hearing Panel are interested in an alternative minimum flow (and corresponding allocation block) for rootstock survival water (horticulture protection water) below the default minimum flows set in Policy D.4.14

126. Nic Conland, Susie Osbaldiston (Senior Hydrologist, Northland Regional Council) and I (Ben Tait) met on 20 September 2018. The key points discussed were:

- The hydrology of Northland
- Nic Conland's technical analysis
- An alternative approach to theoretical time-series modelling.

127. I briefly summarise each matter as follows. First, Northland has a dense, short run river network of over 1,600 source-to-sea catchments (REC 1). Approximately 55% of the rivers in the network have estimated 7-day MALFs of less than 5 L/s and approximately 74% have estimated 7-day MALFs less than 10 L/s. The hydrology, soil, climate, and land use are highly variable across the region and within catchments.

[28] For example, Policy 30.2.3 of the Tasman Resource Management Plan (September 2016), Policy TT9 of the Hawke's Bay Regional Resource Management Plan (October 2015), and Policy 4.1.11 of the Gisborne Regional Freshwater Plan (Decision version, August 2017).

128. It is important to note the location of existing horticulture water takes and the levels of allocation and minimum flows relative to the default allocation limits and minimum flows set in the Proposed Plan. I have appended two maps to this report that highlight that most of the horticulture takes are in fully allocated catchments and are from reaches where minimum flows have been set below the default minimum flows by conditions of existing consents (see Appendices 7 and 8).

129. It is also useful to note that significant horticultural development is unlikely to occur without investment in large scale water storage.[29]

130. Susie Osbaldiston (Northland Regional Council) considers that the theoretical modelling undertaken by Mr Conland was a pragmatic and practical approach. However, she considers that there is a degree of uncertainty associated with the findings particularly in the limit of horticultural allocation of 20% of 7-day MALF under minimum flow and the 25% of crop demand based on soil moisture deficits. This uncertainty is based on the following:

- Modelled (VCS) climate data was used instead of actual data.
- The geohydrological condition in two large theoretical catchments (approximately 200 km^2) were assumed to be uniform.
- Other water abstraction within the catchments was not considered. It does not report the impact of the policy on the security of supply for other users. This does not provide conservative outputs as it excludes other takes which could also be taken below minimum flows i.e., stock drinking and domestic takes.
- Irrigation requirement (water demand) is based on soil moisture deficit. The details of this assessment were not provided in the evidence.
- Averaging over the 40-year period does not provide worst-case or conservative outputs i.e., does not represent Northland's drought severity or consecutive drought years.
- Only two crop types were estimated for irrigation demand based on two soil types.

[29] Darryl Jones (Economist, Northland Regional Council), pers. comm.

131. I understand that it would be difficult to derive alternative minimum flows and allocation blocks for rootstock protection water because of the nature and large number of Northland river catchments. There is also the issue of most horticultural water takes being in highly-fully allocated catchments and from rivers (directly and indirectly via connected groundwater) with lower minimum flows set in conditions of resource consents. I consider that alternative (i.e., lower) minimum flow and associated allocation blocks are best set when establishing catchment-specific freshwater quantity limits.

132. In the interim, I consider that Policy D.4.19 should be amended so that it reads:

D.4.19 Minimum flows and levels

For the purposes of assisting with the achievement of Objective F.0.2 of this Plan, ensure that the minimum flows and levels in H.6 'Environmental flows and levels' apply to activities that require water permits pursuant to rules in this Plan.

Notwithstanding the general requirement in clause 1, this plan sets an alternative minimum flow for rivers (comprising the minimum flow set in H.6 'Environmental flows and levels' less a specified rate of flow particular to an activity) that may be applied where the water is to be taken, dammed or diverted for:

(a) the health of people as part of a registered drinking water supply, or

(b) root stock survival water, or

(c) an individual's reasonable domestic needs or the reasonable domestic needs of a person's animals for drinking water that is, or is likely, having an adverse effect on the environment and is not permitted by a rule in this Plan, or

(d) a non-consumptive take.

Notwithstanding clauses 1 and 2, an application for a water permit:

(a) to replace an existing water permit with a different minimum flow or level to the relevant minimum flow or level in H.6 'Environmental flows and levels' or a flow or level set under clause 2, or

(b) for a water permit for a take above or below an existing take with a different minimum flow or level to the relevant flow or levels in H.6 'Environmental flows and levels' or a flow or level set under clause 2 –

may be granted with an alternative minimum flow to the relevant flow or levels in H.6 'Environmental flows and levels' or flow or level set under clause 2 provided:

(c) downstream low flows and flow variability continue to safeguard aquatic ecosystem health, and

(d) more than minor adverse effects on the reliability of existing lawfully established water takes are avoided.

133. I also recommend that root stock survival water is defined, consistent with the relief sought by Horticulture New Zealand, as water provided for the survival of root stock, including permanent horticultural crops (e.g. kiwifruit, avocado, stonefruit, pipfruit) and hydroponic glasshouse crops, but excluding annual crops.

134. Please note that I discuss the reason for recommending the inclusion of Clause 3 in an amended Policy D.4.19 under the heading "Response to other matters and recommended changes" (below).

Can staff provide a response to the recommendations of Thomas J. Drinan, on behalf of the Minister of Conservation, to amend the minimum flows and allocation limits for rivers in the Small River management unit.

135. Thomas Joseph Drinan, on behalf of the Minister of Conservation, undertook:[30]

> *...a number of scenario analyses of environmental flows from fiver Northland rivers (based on historical data), to highlight the contrasting effect on varying minimum flows and allocation limits, and the resulting impacts on low flow characteristics. I [He] selected rivers (and hydrometric stations thereon) that were within the small rivers management unit, have low indicative surface water allocations, and are mainly upstream of (active) consented takes. The five rivers (and hydrometric stations) include Kaihu (at Gorge), Manganui (at Mititai Road), Opouteke (at Suspension Bridge), Tirohanga (at Tirohanga Road), and Victoria (at Victoria Valley Road). These five rivers are reasonably well distributed throughout the small management unit.*

136. The three scenarios that Dr Drinan investigated for each of the five rivers were:

- $Q_{min}100$ / $\Delta Q_{max}0$ - current (unaltered) flow with a minimum flow of MALF
- $Q_{min}80$ / $\Delta Q_{max}40$ - minimum flow of 80% of MALF and an allocation of 40% of MALF (NRC's proposed minimum flows and allocation limits for the small rivers management unit)
- $Q_{min}90$ / $\Delta Q_{max}30$ - minimum flow of 90% of MALF and an allocation of 30% of MALF (corresponding to Option A in the Section 32 report)

137. Dr Drinan stated in his evidence:[31]

> *For this analysis, I report nine statistics describing the low flow characteristics for each river and each scenario from the available data (Table 2). I have assumed (i) no flow sharing, and*

[30] Expert Evidence of Thomas Joseph Drinan on Behalf of the Minister of Conservation. 10 August 2018. Paragraph 31, page 15.
[31] Ibid, paragraphs 33-34, page 16.

(ii) full allocation is taken throughout the entire assessment period. The corresponding hydrographs for each river and each scenario are presented in Appendix 2.

The scenario analyses show that, at least at the point of flow measurement, the scenario Qmin90/ΔQmax30 generally has a lesser effect on low flow characteristics (relative to the status quo), compared with Qmin80/ΔQmax40. The relative difference between the two scenarios of interest were most evident with regards the frequency, duration, and flow variability at lower flows. Qmin90/ΔQmax30 generally resulted in fewer and shorter low flow periods (those events below Qmin90), and greater flow variability around the minimum flow.

138. I reviewed the outputs from the scenario analysis for each of the five selected rivers in the Small Rivers management unit in Table 2 of Dr Drinan's evidence. Based on the outputs, there appears to be very little difference between the flow characteristics for each river under the $Q_{min}80$ / $\Delta Q_{max}40$ and $Q_{min}90$ / $\Delta Q_{max}30$ scenarios. In other words, the relative difference between the two scenarios of interest were not that evident, particularly with respect to hydrological rules of thumb.

139. Ultimately, deciding on a limit is a value judgement informed by science, economics, and social and cultural values. I recommend that the minimum flow and allocation limit for rivers in the Small Rivers management unit that were proposed by Northland Regional Council unit are retained (i.e., not amended).

Response to other matters and recommended changes

New public water supply takes in fully allocated catchments

140. Far North District Council and Whangarei District Council are concerned that a non-complying activity status for the taking of additional water from a fully allocated water body is unduly restrictive for a new public water supply take. For example, Andrew Venmore, on behalf of the Whangarei District Council and the Far North District Council, stated:[32]

It is It is my view that water takes below a minimum level and water takes that will exceed an allocation limit should be discretionary activities for public water supplies. If these are considered as a non-complying activities, the ability of WDC and FNDC to supply water, as required under the LGA 2002, will be compromised.

[32] Statement of Evidencew of Andrew Venmore on behalf of the Whangarei District Council and Far Northland District Council. 14 August 2018. Paragraph 43, page 9.

141. Ruben Wylie and Jessica Crawford, in their supplementary evidence of on behalf of the Far North District Council and Whangarei District Council, recognise that the NPS-FM directs regional councils to avoid over-allocation and phase out existing over-allocation.[33] Over-allocation is defined in the NPS-FM as the situation where the resource: (a) has been allocated to users beyond a limit, or (b) is being used to a point where a freshwater objective is no longer being met.

142. Ruben Wylie and Jessica Crawford go on to state in their supplementary evidence:[34]

> *We accept that broad criteria for establishing allocation and flow limits are appropriate at a regional scale. However, given the uncertainty associated with these hydrological rules-of-thumb, at the scale of individual reaches or catchments, we consider that it would be appropriate for the PRP to include scope within its policy framework to allow for alternative allocation limits, provided it can be demonstrated that any such limits are not likely to affect instream values or other water takes.*

143. Ruben Wylie and Jessica Crawford then recommend changes to the Proposed Plan to enable such an approach. The recommended amendments are shown from paragraph 93 of their supplementary evidence.

144. I sympathise with the district councils and recognise that the allocation limits in the Proposed Plan will restrict or curtail more water to be taken from some water bodies for use (including public supplies), albeit without a plan change to introduce alternative limits. I also acknowledge the work that Ruben Wylie and Jessica Crawford did in developing recommended amendments to the Proposed Plan. That is, drafting amendments that would potentially allow an application for a water permit (for the health of people as part of a registered drinking water supply) that would allow fresh water to be taken from a river and exceed an allocation limits set in Appendix H.6 to be granted.

145. That said, I understand the recommended amendments may be inconsistent with the direction in the NPS-FM. In other words, the recommended amendments may be ultra vires because the NPS-FM directs regional councils to set allocation limits in regional plans, whereas the recommended amendments appear to provide for additional allocations that will exceed limits.

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[33] Supplementary Evidence of Ruben Wylie and Jessica Crawford. Response to Panel Questions. 2 October 2018. Paragraph 86, page 17.
[34] Ibid, paragraph 92, page 18.

146. Gerard Willis, in his evidence for Fonterra, pointed this out:[35]

> *...Council cannot set allocable flows and then create "exceptions" to them. By definition, that involves "over-allocating" which is contrary to NPSFM Policy B5.*
>
> *This means that the allocable flows must be set/defined to accommodate the exceptions the Council wishes to make.*

Applications for water take permits for rivers and river reaches with different minimum flows or levels

147. Earlier in this section of the report, I recommended changes to Policy D.4.19 in response to a question from the Hearing Panel. The recommended amendments include a new clause (Clause 3), which I have reproduced below.

> *3) Notwithstanding clauses 1 and 2, an application for a water permit:*
>
> *(a) to replace an existing water permit with a different minimum flow or level to the relevant minimum flow or level in H.6 'Environmental flows and levels' or a flow or level set under clause 2, or*
>
> *(b) for a water permit for a take above or below an existing take with a different minimum flow or level to the relevant flow or levels in H.6 'Environmental flows and levels' or a flow or level set under clause 2 –*
>
> *may be granted with an alternative minimum flow to the relevant flow or levels in H.6 'Environmental flows and levels' or flow or level set under clause 2 provided:*
>
> *(c) downstream low flows and flow variability continue to safeguard aquatic ecosystem health, and*
>
> *(d) more than minor adverse effects on the reliability of existing lawfully established water takes are avoided.*

148. The clause replaces proposed Policy D.4.19(2) which stated:

> *An application for a water permit that would allow water to be taken from a river, lake or natural wetland when flows or levels are below a minimum flow or minimum level will generally not be granted. A resource consent may be granted if... (2) a different minimum flow or minimum level has been set for the water body in a resource consent.*

149. The purpose of the policy is to provide for the situation where an existing consent sets a different minimum flow (in most cases lower flow) than the minimum flows set in Policy D.4.14 of the Proposed Plan, and (e) an application is made to replace the consent and associated minimum flow conditions, or (b) where an application is made

[35] Statement of Primary Evidence of Gerard Mathew Willis for Fonterra Co-operative Group Limited. Planning. 10 August 2018. Paragraphs 7.11-7.12, page 13.

for a water permit for a take above or below an existing take with a different minimum flow or level to the relevant default minimum flow or level set in the Proposed Plan.

150. For example, and regarding the latter situation, if a person applied to take water below an existing take with a lower consented minimum flow than a default minimum flow in the Proposed Plan, the default minimum flow would not be relevant. If it was to be applied, the person wanting to take water below the existing take would have very poor security of supply.

151. I am not able to comment on the reasons for multiple consents being issued with lower minimum flows than the default minimum flows set in the Proposed Plan. However, it suffices me to say the lower minimum flows were deemed to be appropriate and sustainable for each consent. I consider that it would be inappropriate to remove the ability for people with existing consents with lower minimum flows than the default minimum flows in the Proposed Plan to reapply for a water permit with the same minimum flow or level. It is important to note that many of the water permits with lower minimum flows are for public water supplies. Replacing the consented lower minimum flows with the default minimum flows will likely have significant negative effects on the security (i.e., reliability of public water supplies).

152. Rivers and reaches of rivers with lower minimum flows than in Policy D.4.14 are shown in an attached map titled “Consented Takes and Minimum Flows below the Default Limits (as at 11 September 2018).

153. Several submitters, including Northland Fish and Game and the Royal Forest and Bird Protection Society of New Zealand have requested that Clause 2 of Policy D.4.19 be deleted. I disagree with their request but recommend amending Policy D.4.19 to clarify the circumstances that an alternative minimum flow may be set.

Allocation limits for rivers and aquifers

154. Gerard Willis, on behalf of Fonterra, identified two key planning issues with the RMA s42A recommended amendments to the allocation limits for rivers and aquifers (in Appendix H.6 ‘Environmental flows and levels’). The first issued he identified is that “the status of the text proposed to follow Table 23 [Allocation limits for rivers] in Appendix H.6 is unclear.”[36] I agree with Mr Willis that the explanatory notes (about how

[36] Statement of Primary Evidence of Gerard Mathew Willis for Fonterra Co-operative Group Limited. 10 August 2018. Paragraph 7.21, page 14.

MALF is to be determined and applied) are a matter of policy, and that this should be clarified in the Proposed Plan.

155. The second issue relates to the way that recommended Appendix H.6 is structured and exceptions to limits. I consider that the issue could be resolved, in part, by modifying the Appendix H.6 by:

- Expressly providing for takes associated with takes that existed at the notification date of the Proposed Plan and that are subsequently authorised by resource consents under rules C.5.1.7 and C.5.1.9;
- Clarifying that the allocation limits (groundwater and surface water) take into account, i.e., provide for quantities allowed to be taken under section 14(3)(b) of the RMA and permitted to be taken by rules in the Proposed Plan; and
- Clarifying that the allocation limits do not apply to non-consumptive takes.

156. Please see the detailed amendments in *Reply Report Tracked Changes Version of the Plan*.

Permitted volumes for minor takes

157. Several submitters, the majority of which are dairy farmers or dairy industry representatives (Fonterra, DairyNZ and Federated Farmers), requested a larger permitted total daily take volume in Rule C.5.1.1.

158. I continue to recommend that the maximum volume of water that can be taken as a permitted activity should be 10 cubic metres per day, per property and from all sources.

159. My justification is set out at paragraph 249 in the RMA s42A report titled “Allocation and use of water”.

Permitted taking of geothermal heat

160. Trevor Robinson, Counsel for New Zealand Geothermal Association Inc., stated in his legal submission for New Zealand Geothermal Association Inc:[37]

[37] Trevor Robinson. Legal Submissions for New Zealand Geothermal Association Inc. 4 September 2018. Paragraph 24, page 10.

As noted, the Reporting Officer has recommended changes to RuleC.5.1.1 to include reference to "associated heat and energy". The performance standards for the permitted activity do not, however, impose any limit on the amount of heat that might be taken so as to ensure an acceptable level of effect.

As Ms Luketina notes10, down-hole heat exchangers circulating fresh water through underground geothermal water or hot rock can extract heat without any take of geothermal water. If there is no performance standard on such takes, there is the potential for adverse environmental effects, including cross bore effects. Ms Luketina notes that the relevant rule in the Waikato Regional Plan imposes a maximum rate of heat take without taking water of 7500 megajoules per day. NZGA's submission sought that this limit be utilised. It is submitted that it might appropriately be inserted as an additional performance standard in Rule C.5.1.1.

161. Having considered the evidence of the New Zealand Geothermal Association Inc. I recommend including a maximum rate of geothermal heat take in Rule C.5.1.1 of 7500 megajoules per day.

Water takes associated with existing quarry and mine site dewatering

162. The RMA s42A report titled "Allocation and use of water" contains a recommendation to include a controlled activity in the Proposed Plan for water takes associated with existing quarry and mine site dewatering.

163. Catherine Clarke, for GBC Winstone, stated:[38]

GBC-WA was generally supportive of the management approach in the rules in Section C.5 – Taking and Using Water, however sought the existing Rule 25.2.1 –Existing Quarry and Mine Site Dewatering in the Operative Water and Soil Plan for Northland (or a rule to similar effect), be included in the PRPN. Existing Rule 25.2.1 provides that all ground dewatering of existing quarries and mine sites and ground dewatering by way of existing drainage sumps which did not draw down water from at risk aquifers be assessed as a controlled activity. The s.42A report recommends a new rule, 'Water take associated with existing quarry and mine site dewatering' and states this new rule has been imposed to be consistent with the approach in the Regional Water and Soil Plan15. However, the new rule omits providing for "ground dewatering by way of existing drainage sumps" as provided for in Rule 25.2.1 of the Water and Soil Plan, and also referred to in the evidence of Ms Hall.

164. Having considered the evidence of GBC Winstone, I recommend that recommended rule C.5.1.5A is amended as per the company's request. The amendments are shown in the Proposed Regional Plan for Northland - Officer recommendations (October 2018).

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[38] Statement of Evidence of Catherine Clarke for GBC Winstone ('GBC-W'). 14 August 2018. Paragraph 7.1, page 18.

Definition of median flow

165. Nicholas A. Conland, for Horticulture New Zealand, recommended changes to the definition of the term median flow.[39] I support the sought amendments and consider that they should be adopted.

Aquaculture

Author: Ben Lee

Hearing panel requests

Provide panel a revised definition of "biogenic habitat" - one that is simpler than that proposed in the response to hearing panel questions doc and doesn't include example.

166. The definition proposed[40] was:

> *Biogenic habitat:*
>
> *Either -*
>
> - *Emergent three-dimensional structure, formed by living species, that separate areas in which it occurs from surrounding lower vertical dimension seafloor habitats; or*
> - *Non-living structure generated by living organisms, such as infaunal tubes and burrows.*
>
> *For the purpose of this Plan, biogenic habitat created by pest organisms is excluded.*
>
> *Examples of biogenic habitats include:*
>
> - *Areas of biogenic "reef" formed by rigid or semi-rigid organisms e.g. beds of shellfish (horse mussels, green-lipped mussel, dog cockle beds, shell hash); bryozoan fields, larger hydroids, maerl/rhodolith beds (red algae that form nodules of calcium carbonate)*
> - *mangrove forests, kelp forest, other seaweed beds, beds of Caulerpa, a green alga, seagrass meadows, sponge gardens.*
> - *the burrows created by crabs, tubeworm mounds.*

[39] Statement of Evidence by Nicholas Ashley Conland for Horticulture New Zealand. 10 August 2018. Paragraph 29, page 7.

[40] *Hearing Panel S42A questions and council staff responses*, August 2018

167. A simpler definition is:

> *"Habitat on the seabed created by the physical structure of living or dead organisms, or by their interactions with the seabed"*

168. I recommend the definition be changed to this wording.

"Authorised area" – could staff please confirm what this means (particularly in regard to aquaculture – refer rule C.1.3.7).

169. "Authorised area", and derivatives are used throughout the aquaculture rules, and in no other part of the Plan. "Authorised" is defined in the Plan as:

> *Expressly allowed by a:*
>
> *1) national environmental standard or other regulations, or*
>
> *2) a rule in a regional plan as well as a rule in a proposed regional plan for the same region (if there is one), or*
>
> *3) a resource consent.*

170. Aquaculture is only expressly allowed by a resource consent, therefore the "authorised area" is the physical area a resource consent allows aquaculture to occupy.

171. Rule C.1.3.3 uses the words "…*the area the aquaculture activities are authorised to occupy…".* I recommend all the aquaculture rules be amended to be the same.

Response to other matters and recommended changes

Yachting NZ – recreational activities

172. Yachting New Zealand advocated[41] for effects on recreation and amenity values to be a matter of discretion for realignment and extensions of aquaculture. I agree that effects on recreation is a justified addition to the rules (C.1.3.3 and C.1.3.4), for the reasons set out in the legal submissions, but I do not agree with the addition of effects on amenity values. Amenity values are a broad set of values, many of which are already included as matters of discretion.

[41] Yachting NZ legal submissions, parag 40.

Rule C.1.3.11 - Relocation of aquaculture within the Waikare Inlet and Parengarenga Harbour

173. In my S42 report, I recommended rule C.1.3.11 remain non-complying, and that I would reconsider the activity status for the Waikare Inlet depending on evidence. However, in the S42A version of the Plan, I had recommended it be changed to discretionary – this was an error.

174. I continue to recommend keeping the relocation of aquaculture in Parengarenga a non-complying activity for the reasons outlined in the Section 42A report. However, I now recommend that relocation in the Waikare Inlet be a discretionary activity based on the evidence of James Dollimore[42] (paragraph 11), Rebecca Clarkson[43] (paragraphs 42 – 44), and David Taylor[44] (paragraphs 32 – 34).

Richard Turner evidence - Aquaculture NZ Ltd, The NZ Oyster Industry Association and Moana NZ Ltd

175. In his evidence, Richard Turner suggested various amendments to the aquaculture provisions. I agree with his following suggestions for the reasons outlined in his evidence:

- Deleting "*Effects on historic heritage*" as a matter of control or discretion in rules C.1.3.1 and C.1.3.2.

- Deleting D.5.4(2).

176. Richard Turner also *s*uggests that is necessary for the rules for existing aquaculture include in the "RMA activities this rules covers" the s12(1) elements relating to the construction of structures (s12(1)(b)(c) and(e). The rationale being this is the way it is done in other regional plans.

177. I agree that s12(1)(b)(c) and (e) elements need to be added to the rules, but not for the erection or placement of the original structure. We have sought legal advice (Appendix 4) which confirms that s12(1)(b)(c) and (e) are not required for the existing structure. However, the advice raises the practical issue of the rule not covering any

[42] Aquaculture NZ Ltd, The NZ Oyster Industry Association and Moana NZ Ltd
[43] Aquaculture NZ Ltd, The NZ Oyster Industry Association and Moana NZ Ltd
[44] Aquaculture NZ Ltd, The NZ Oyster Industry Association and Moana NZ Ltd

reconstruction, replacement, maintenance or repair of the structure. In the absence of the rule including these s12(1) elements, the reconstruction etc would be an innominate activity (and therefore require consent as a discretionary activity) because there are no applicable rules (note the statement at the start of the aquaculture rule which says that the general structures (C.1.1) rules do not apply).

178. I have also recommended the inclusion of a new rule (C.1.3.1A) to permit the demolition or removal of structures used for aquaculture activities – otherwise demolition or removal would also require resource consent as an innominate activity.

Catchments

Author: Justin Murfitt

Hearing panel requests

Provide panel with amended wording of E.0.7and E.0.9 as proposed in the staff opening statements (parag 35), showing changes from S42a as tracked changes.

179. The primary intent of livestock exclusion rules E.07 and E.0.9 were to add additional requirements over and above the region-wide rules to meet objectives of the Whangarei Harbour and Mangere catchment plans (to improve swimming water quality in the Whangarei Harbour catchment and reduce sediment and improve aquatic ecosystem health in the Mangere). These are achieved in the plan by adding additional requirements into the tables for each rule – namely additional livestock exclusion requirements for rivers above the two swimming sites in the Whangarei Harbour catchment and extending livestock exclusion requirements for beef, dairy grazing and deer to hill country rivers in the Mangere catchment. In other respects, the region-wide rule (C.8.1.1) and catchment rules were intended to be as similar as possible.

180. I note in relation to livestock exclusion rules, both catchment plans stated: "*regional rules are to apply with the additional requirement that...".* I recommended changes to Rules E.0.7 and E.0.9 in the s42A report to achieve as much consistency as possible with recommended changes to region-wide livestock exclusion Rule C.8.1.1 without distorting the intent of the catchment specific rules – these changes included

amendments to livestock exclusion requirements for wetlands (I.e. the addition of the 2000m^2 threshold for livestock exclusion and deletion of the reference to significant wetlands), as in my view there was no case for a different approach in the Mangere or Whangarei Harbour catchments. After considering evidence presented on livestock exclusion provisions in the hearings, I remain of the view that Rules E.0.7 and E.0.9 should be as consistent as possible with Rule C.8.1.1, while retaining the direction in the catchment plans and that the text preceding the tables in E.0.7 and E.0.9 should mirror Rule C.8.1.1 to minimise confusion, complexity and improve implementation. I note Mr Glenn Mortimer presented evidence to the Commissioners on the Whangarei Catchment provisions where at Para 1.4 of his evidence he says: "*...I am aware that the s42A reporting officer...has recommended some minor amendments to Rule E.0.9 for consistency with other similar PRP rules. I agree with those minor amendments."* I therefore consider the changes to the tables relating to wetlands recommended in the s42A report should stand in both rules E.0.7 and E.0.9.

181. For similar reasons, recommended changes in *Reply Report Tracked Changes Version of the Plan* adopted for Rule C.8.1.1 in my view should also be applied to E.0.7 and E.0.9 (for example recommended livestock exclusion requirements above public drinking water supply intakes). In terms of scope for this, both Whangarei and Far North District Councils sought amendment to stock exclusion rules to protect drinking water supplies (WDC submission Pg 28) - while stated in reference to Rule C.8.1.1, the relief seems cast in broad terms and states: "*WDC request that a rule framework similar to that applying to swimming sites in the Whangarei Harbour catchment be applied to all registered public drinking water intakes."* Further, FNDC states in relation to the relief sought*: Seek more stringent standards for stock exclusion within 1km of a potable water take or similar relief (*FNDC original submission Pg 17*).* This is echoed in the evidence presented by Mr Venmore at Para 96. I therefore consider that there is scope to amend the text preceding the tables in Rules E.0.7 and E.0.9 to align with changes to region-wide livestock exclusion Rule C.8.1.1. It would also be incongruous if protection for public drinking water supplies recommended to be included in the *Reply Report Tracked Changes Version of the Plan* version of Rule C.8.1.1 (if adopted) did not extend to the Mangere and Whangarei Harbour catchments. I consider that these amendments recommended in relation to Rule C.8.1.1 in *Reply Report Tracked Changes Version of the Plan* are appropriate and would not be contrary to the objectives or intent in either catchment plan, provided the catchment specific elements are retained (I.e. additional livestock exclusion requirements for rivers above the two swimming sites in the Whangarei Harbour

catchment and extending livestock exclusion requirements for beef, dairy grazing and deer to hill country rivers in the Mangere catchment). Given the above, the Commissioners may wish to consider merging the catchment specific livestock exclusion requirements of Rules E.0.7 and E.0.9 into the table for Rule C8.1.1 for simplicity.

Provide the Panel with an example erosion control plan or if there is none, any information that would assist the Panel with understanding the form and content of an erosion control plan as anticipated by the Plan (e.g. rule E.0.10).

182. Council's Land Management Advisor John Ballinger has prepared an Erosion Control Plan (ECP) as an example anticipated by catchment specific Rules E.0.1, E.0.6, E.0.8 and E.0.10 (Refer **Appendix 3**). This ECP is based on the requirements of Appendix H.4 Erosion Control Plans as recommended in the S42 version of the Plan. It has been developed for a 3.9ha lifestyle block in the Whangarei Harbour catchment - it is likely that an ECP developed for a pastoral farming operation would have more detail in terms of both analysis and remedial recommendations although this is dependent on the characteristics of the site and the nature of erosion evident.

Response to other matters and recommended changes

Rule E.0.2 -Water takes from Lake Waiporohita - discretionary activity

183. In the s42A report I recommended adding a reference to s14(3)(b) into the section on the 'RMA activities this rule covers' to make it clear that takes for domestic use and stock drinking water from Lake Waiporohita were within the ambit of the rule and therefore required resource consent. This change was recommended as a clarification. Federated Farmers opposed this in their submission and sought the rule exempt s14(3)(b) takes. At the hearing, Federated Farmers opposed the s42A recommendation stating this change was substantive and beyond the scope of a clarification and provided an opinion from Mr Richard Gardner to support this position (Appendix to evidence of D Bidlake). I disagree that the change is substantive or out of scope as the Section 32 report clearly signalled the intent to restrict s14(3)(b) takes from the lake – for example it identified Option C as the preferred option at Page 495 (Option C was to require all takes from Lake Waiporohita to obtain resource consent as a discretionary activity including section 14(3)(b) takes for stock drinking and domestic use).

184. Rule E.0.2 also clearly states that water takes for *any purpose* (emphasis added) from the lake are discretionary activities. I therefore do not consider the inclusion of s14(3)(b) takes in the RMA activities covered by Rule E.0.2 is substantive or out of scope as this was always the intent of the rule. With respect I do not agree with Mr Gardner's opinion that there is an explicit legal 'bar' that prevents councils from including rules in regional plans restricting s14(3)(b) takes – in fact at Para 20 he cites a case (*Carter Holt Harvey v Waikato Regional Council*) where the Environment Court seems to suggest that identifying areas where s14(3)(b) takes are to be restricted in regional plans is of benefit. I also note the Waikato Regional Plan appears to include restrictions on s14(3)(b) takes in certain circumstances (Discretionary Activity Rule – Surface Water Takes 3.3.4.23(1)). It seems Mr Gardner does not strongly oppose the intent of the rule and at Para 31 suggests adding a note to the effect that: *Any water takes from Lake Waiporohita are likely to have an adverse effect on the environment and therefore should be assessed through the resource consent process*. I have some reservations about the legal effect or enforceability of such a note if applied to s14(3)(b) takes and still prefer the option in my s42A recommendation on the basis this is more explicit. If the Commissioners consider the recommendation in the s42A is beyond scope (as a clarification), then an alternative would be to adopt the suggestion of Mr Gardner and include an explanatory note to the rule.

Coastal reclamation

Author: Michael Day

Hearing panel requests

185. None

Response to other matters and recommended changes

186. None

Coastal structures

Author: Michael Day

Hearing panel requests

187. None

Response to other matters and recommended changes

Definition – Functional need

188. In the s42A report for Coastal Structures, I recommended merging the definitions of 'functional need' and 'operational need'. After considering evidence from Cath Heppelwaite[45] (paragraph 8.16), I now recommend a further amendment to this definition - the inclusion of reference to 'network' (to provide clarity).

189. I have given further thought to the evidence provided from Pauline Whitney (on behalf of Transpower New Zealand), regarding the activity being dependant 'on a particular location to operate, or is required to traverse, locate or operated in a particular environment'. As well as to strike out reference to coastal marine area (thereby meaning that the policy would apply outside the coastal marine area). I do not support this request because the only rules that refer to 'functional need' are within the coastal structures section (and only apply to activities within the coastal marine area). This is consistent with Policy 6(2)(c) o the New Zealand Coastal Policy, which requires councils to '*recognise that there are activities that have a functional need to be located in the coastal marine area (my emphasis) and to provide for those activities in appropriate places'*.

Rule C.1.1.1 Existing structures – permitted activity

190. After considering evidence from Catherine Clarke (paragraph 5.5)[1] and Bridgette Munro (paragraph 8.34)[2], I recommend that clause 14) of rule C.1.1.1 is amended to refer to boat ramps, concrete spillways and mooring dolphins.

[45] On behalf of New Zealand Transport Agency

Rule C.1.1.3 Temporary coastal structure – permitted activity

191. After considering evidence from Bridgette Munro[46] (paragraph 8.41), I am recommending an amendment to clause 6) to recognise that for the repair and maintenance of regionally significant infrastructure, it may be necessary to erect temporary scaffolding, weather protection wrap or fencing for more that 30 days.

Rule C.1.1.6 Monitoring and sampling equipment – permitted activity

192. After considering evidence from Jeremy Brabant[47], I agree that if monitoring and sampling equipment is placed within 'regionally significant anchorages '(as a permitted activity), there is potential for this equipment to cause/become a hazard to navigation (for the reasons outlined in Mr Brabant's evidence) and therefore potentially render 'regionally significant anchorages' unsafe for anchorage. Consequently, I now recommend a new clause 1a) with words to the effect that <u>it is not located within a mapped regionally significant anchorage.</u>

Rule C.1.1.7 Reconstruction, replacement, maintenance or repair of a structure – permitted activity

193. In my section 42A report for Coastal Structures, I recommended the insertion of 'and form' into clause 3). On reflection, I no longer consider that this is necessary, as the requirements of clause 2) sufficiently cover this.

Rule C.1.1.8 Maintenance, repair or removal of hard protection structures – permitted activity

194. After considering evidence, in response to the evidence of Rebecca Beals[48] (paragraph 44), I recommend amending clause 1) relating to the requirement to provide prior notice before undertaking the activity, so that this only applies if the activity involves the use of vehicles on the foreshore or seabed or the removal of hard protection structures.

195. I have given further thought to evidence from submitters who have requested the ability to 'marginally increase' the length, width or height of hard protection structures (such as Atlas Quarries, Refining NZ and Fonterra). However, my thoughts remain the

[46] On behalf of Refining New Zealand
[47] On behalf of Yachting NZ
[48] On behalf of Kiwirail

same as I outlined in the s42A report for Coastal Structures – that is, I consider that allowing hard protection structures to be increased in height, width or length (as a permitted activity) may well open the door for the rule to be abused (such as by cumulatively increasing the length or height of the hard protection structure). I also consider that allowing for increases in height or length is actually outside the scope of this rule (which essentially envisages maintenance or repair of the hard protection structure).

196. This aside, noting that the definition of 'hard protection structure' includes stopbanks, to be consistent with how I am proposing to treat the maintenance of stopbanks in other sections of the Proposed Plan (such as the Land Drainage and Flood Control section), I recommend a minor amendment to clause 3) to state *other than to provide for the settlement of earthern stopbanks*.

Coastal policies – Coastal Commercial Zone and Marsden Point Port Zone

197. After considering evidence from Catherine Clarke (paragraph 9.25)[1], I am of the opinion that an enabling policy (like Policies D.5.15 and D.5.8) should be included for the Coastal Commercial Zone and the (proposed) Marsden Point Port Zone.

Policy D.6.1 – Appropriateness or hard protection structures

198. The notified version of Policy D.6.1 (2) referred to 'proposed' infrastructure. In my Section 42A report, I recommended that clause 2) of Policy D.6.1 be amended by striking out the word 'proposed'. After considering evidence from Rebecca Beals (paragraphs 57-59)[2], I am now of the opinion that clause 2a) of Policy D.6.1 should be amended to refer to existing or planned regional significant infrastructure.

Coastal works general conditions

199. In response to evidence, I am recommending several amendments to the coastal conditions. These are outlined below. Firstly, in response to evidence from Matt Smith[49] (paragraph 17), I am recommending the inclusion of a condition relating to needing to obtain the written approval from the land owner if the activity is undertaken on private land.

[49] On behalf of Kaipara District Council

200. Secondly, in response to evidence from Graeme Silver[50] (paragraph 61), I am proposing an amendment to condition 8) so that the condition reads 'there shall be no damage to shellfish beds in mapped Significant Ecological Areas and no damage to saltmarsh or seagrass meadows except as necessary for the installation of an aid to navigation. I consider that by widening the 'protection' of saltmarsh and seagrass meadows by ensuring there is no damage across the entire region (and not just within mapped significant ecological areas) will assist with giving effect to Policy 11 of the NZ Coastal Policy Statement.

201. Thirdly, after considering evidence from Whangarei District Council (Andrew Carvell, paragraph 92) and Far North District Council, I am recommending amendments to condition 11)a) by including 'permanent scouring' and 11)c) by including the word 'materially' at the start of the condition. I consider that these amendments will ensure the conditions are more practical and workable.

Contaminated land

Author: Michael Payne

Hearing panel requests

Evidence of Soil and Rock Consultants, Parag 16, 17 and 18 regarding rule C.6.8.2 (3) and (4) – Council staff to provide a response in Reply.

202. In Paragraph 16 of her evidence Ms Tenger seeks the inclusion of sediment quality standards in rule C.6.8.2. Mr Hunt provides evidence (Appendix 12) on this matter and recommends that sediments standards are not included in rule C.6.8.2. I support Mr Hunt's recommendation and have not included sediment quality standards in *Reply Report Tracked Changes Version of the Plan* on that basis.

203. In paragraph 17 of her evidence Ms Tenger makes the following statement:

> *It is proposed that the acceptance criteria for PFOS, PFHxS and PFOA are referenced to their source document as per the other contaminants, this allowing for any future changes to these values through the technical document update rather than requiring a plan change.*

[50] On behalf of the Minister of Conservation

204. I assume Ms Tenger's concern is similar to that expressed by Mr Proffitt in that the nature of the science on these substances is evolving and this could result in changes to the guideline values to protect human and ecological health. Unfortunately, the solution Ms Tenger suggests would result in an invalid permitted activity condition. Case law has established that permitted activities must be clear and cannot provide councils with later discretion. In the context of rule C.6.8.2, this means that we must either specify a value or specify a specific edition of technical documents. Either way Council would need to undertake a plan change to update the guideline values for PFAS substances if they change in the future.

205. I comment on paragraph 18 of Ms Tengers evidence in C.6.8.2 - Benzene, below.

Response to other matters and recommended changes

Policy D.4.10A

206. The Oil Companies recommend several change to clause 1 of this policy to improve the clarity/readibility of the policy. I believe these changes are helpful and recommend that they are accepted by the Hearing Panel.

207. The Oil Companies also seek to replace "pose a significant adverse effect" with "cause an unacceptable risk to" . I accept the reasoning set out in paragraph 6.5 of Mr Le Marquands evidendce and agree with the amendments he recommends.

New Policy

208. In his evidence[51] Mr Le Marquand seeks an aditional policy.

> *New Policy: Identify and record the details of land containing elevated levels of contaminants in a public register.*

209. The Proposed Regional Plan has a regulatory focus. Council made a concious decision to exclude non-regulatory polcies and methods from the plan. The suggested policy is a non-regulatory policy. I do not support including this point of relief in the Proposed Plan.

[51] The Oil Companies, Lemarquand. Para

C.6.8.2 - Discharges from contaminated land

Benzene

210. I accept the point raised by Mr Le Marquand[52] and Sharon Tenger[53] in relation to applying the ANZECC 95% protection of species guideline value for benzene in sensitive groundwater and recommend that the Hearing Panel adopt this change as shown in *Reply Report Tracked Changes Version of the Plan*.

Per and polyfluorakyl substances

211. In his evidence[54] Mr Proffitt discusses the inclusion of the perfluoroalkyl substances (PFAS) perfluorooctane sulfonate acid (PFOS), perflurohexane sulfonate (PFHxS), and perfluorooctanoic acid (PFOA) within the various conditions of rule C.6.8.2. The relief sought by the Oil Companies, which is supported by evidence from Mr Proffitt, is to delete conditions relating to PFAS substances from C.6.8.2.

212. To inform our response to submissions on the contaminated land provisions Council sought advice Simon Hunt of EHS Support Limited. Mr Hunt has provided evidence (Appendix 12) for the hearing panels consideration, including comment on the basis for PFAS thresholds in the Proposed Plan and whether they should be included in the Northland Regional Plan.

213. I support the evidence of Mr Hunt and provide the following options on how Mr Hunts advice could be used in the Proposed Plan for the panel's consideration. In doing so, I acknowledge the science with respect to the risks presented by PFAS is still evolving and that the guideline values for the protection of human health and ecological health may change in the future.

214. I am also mindful that guidance from the Ministry for the Environment makes it clear that regional councils have regulatory responsibilities in relation to PFAS substances:

Regulatory responsibilities

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[52] The Oil Companies, Le Marquand, Para 5.4
[53] Soil and Rock Consultants, Sharon Tenger. Para 18
[54] Greame Proffitt, 10 August 2018. *Statement of evidence by Greame Proffitt for Z Energy LTD, Mobile Oil NZ Ltd, BP Oil NZ Ltd (the Oil Companies)*, Paragraphs 5.14 - 5.22

Regional councils in respect of:

- *Contamination of land or water [s.30(1)(f) RMA];*
- *The cause of ongoing contamination (i.e. leaching of PFAS from soil into groundwater) and other environmental effects from PFAS contamination;*
- *A function to investigate land for the purposes of identifying and monitoring contaminated land [s.30 (1)(ca) RMA]* [55]

215. If the hearing panel, is of a mind to remove the references to PFAS substances from rule C.6.8.2 the hearing panel may wish to consider amending Clause 2 as shown below;

2) the site investigation report demonstrates that the passive discharge of the contaminants of concern ~~does not exceed~~ is equal to or less than the relevant contaminant concentrations set out in clauses 2A to 5 ~~3- 11~~ below:[215]

216. Replacing "*does not exceed"* with "*equal to or less than" would* exclude any substance not listed in ANZECC (2000) or the Drinking Water Standards 2005 (revised 2008) from the permitted activity rule. Including PFAS substances.

217. If this change is adopted, the passive discharge of PFAS substances would be a discretionary activity (rule C.6.8.4). As a discretionary activity applicants and council would be able to utilise the most recent guidance. The flexibility of a discretionary activity status appears address the concerns raised by Mr Proffitt in respect to the evolving nature of our understanding of PFAS substances and the potential changes in guidelines values.

218. This amendment would require up to 9[56] resource consents for the passive discharge of PFAS substances. This figure is based on an exercise Council recently undertook to identify sites within the Northland region where PFAS there is a potential risk of contamination.

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[55] Ministry for the Environment. *PFAS (per- and poly-fluoroalkyl substances)*. Retrived 23 October 2018. http://www.mfe.govt.nz/land/pfas-and-poly-fluoroalkyl-substances

[56] This figure is based a Northland wide assessment of sites where there is a potential risk of PFAS contamination undertaken by Northland Regional Council. March 2018.

219. In the wording suggested by Mr Le Marquand all references to PFAS substances are deleted. I am concerned that the effect of this change may be that the passive discharge of PFAS substances, no matter how high or low the concentration, is a permitted activity. Proposed rule C.6.8.2 is centred on the words *does not exceed*. Given that neither the Drinking Water Standards 2005 or ANZECC 2000 contain values for PFAS substance it could be argued that the threshold is not exceeded because no value is specified. In my opinion, this approach is very permissive, and I do support it.

General

220. Graeme Proffitt, in paragraph 5.12 of his evidence recommends deleting the phrase "and applied in accordance with those guidelines" from C.6.8.2. Based on the evidence provided by Mr Proffit I reccomend that this term be deleted from rule C.6.8.2.

221. In addition, Mr Proffitt and Mr Le Marquand recommend amendments to rule C.6.8.2 to correct references to ANZECC and improve the layout and readibility of this rule. I support these changes.

222. Mr Hunt has provided evidence and recommendations (Appendix 12) on a number of aspects of contaminated land on 29 October. While I have drafted changes in the *Reply Report Tracked Changes Version of the Plan* for Mr Hunts recommendations on per and polyfluorakyl substances I have not had the opportunity to draft amendments based on his recommendations for *lines of evidence in the management of contaminated sites or Management of DNAPL.* I will endevor to table draft wording, that gives effect to Mr Hunt's recommendations when hearings reconvene on 6 November.

C.6.8.3A - Contaminated land remediation

223. In his evidence[57] Mr Le Marquand recommends changes to the matters of control. These changes substantially reduce the length of the rule while maintain an adequate level of control. I support these amendments.

[57] Oil companies – proposed plan provisions tabled at hearing

224. In addition, Mr Le Marquand recommends amendments to the chapau of this rule that would make the passive discharge of contaminants a controlled activity where they are unable to meet the permitted activity conditions. I do not support this amendment for the reasons set out in the 42A report[58] .

C.6.8 3B – Re-consenting passive discharges from contaminated land

225. In his evidence[59] Mr Le Marquand recommends changes to the matters of control of rule C.6.8. 3A. I support those changes and believe that rule C.6.8.3B would also benefit from the amendments suggested by Mr Le Marquand.

Definition – Contaminant of concern

226. In her evidence Ms Wharfe[60] argues that a definition of ”contaminant of concern” is necessary puts a definition forward for consideration. I support the inclusion of this definition as suggested by Ms Wharfe.

Definition – Suitably qualified and experienced practitioner (SQEP)

227. In his evidence Mr Proffitt recommends including a definition of ”suitably qualified and experienced practitioner”. This definition is drawn from page 17 of the National Environmental Standard for Assessing and Managing Contaminants (NES:CS) in Soil Users' Guide[61]. I recommend the Hearing Panel adopt this definition with amendments shown below;

A suitably qualified and experienced practitioner (SQEP) is a senior or principal scientist or engineer, with a relevant tertiary qualification and at least 10 years of contaminated land experience or hold a current Site Contamination Specialist certification under the CEnvP Scheme.

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[58] Northland Regional Council, July 2018. *Contaminated land Recommendations in response to submissions on the Proposed Regional Plan for Northland - Section 42A hearing report.* paragraphs 26-32

[59] Oil companies – proposed plan provisions tabled at hearing

[60] Hort NZ, Wharfe, para 6.23

[61] *Users' guide: National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health*, see: http://www.mfe.govt.nz/publications/rma-land-hazards/users-guide-national-environmental-standard-assessing-and-managing

228. The Certified Environmental Practitioner website describes the scheme as;

> *The Certified Environmental Practitioner Scheme is an environmental industry recognised Certification scheme open to environmental professionals who can meet the requisite competency criteria of experience, training, conduct and ethics.*

229. While the CEnvP certification is recognised in NES:CS users guide as being a suitable certification for a SQEP the eligibility criteria are different to those specified in the NS:CS users guide. The eligibility criteria include;

- 10+ years environmental experience,
- 8+ years site contamination experience
- An engineering, science and environment related Degree
- Commitment to training and professional improvement
- Evidence that the candidate is a respected, competent, ethical and active member of the profession

Dredging, disturbance and disposal

Author: Michael Day

Hearing panel requests

230. None

Response to other matters and recommended changes

Rule C.1.5.8 Clearing of tidal stream mouths – permitted activity

231. After giving further consideration to this rule, I am recommending deleting condition 7)a) because I consider that the rule (as drafted) is not appropriate as a permitted activity rule because condition 7a) contains essentially a third party approval, which is not appropriate.

Rule C.1.5.9 Burial of dead animals – permitted activity

232. In response to evidence from the Minister of Conservation[62], I recommend the inclusion of a new clause 3) to state that *where practicable, adverse effects on indigenous vegetation are minimised*. I consider this will assist with giving effect to Policy 11 of the New Zealand Coastal Policy Statement.

Policy D.5.18A Benefits of dredging, disturbance and deposition activities

233. My section 42A Report for Dredging, disturbance and disposal activities recommended a new policy entitled 'Benefits of dredging, disturbance and deposition activities'. After considering evidence from Pauline Whitney[63] (paragraph 103), I now recommend an additional clause be inserted to recognise regionally significant infrastructure within the policy. I consider the following appropriate: Recognise that dredging, disturbance and deposition activities may be necessary *for the operation, maintenance, upgrade and development of regionally significant infrastructure*.

Earthworks, land preparation, vegetation clearance and bores

Author: Ben Tait

Hearing panel requests

234. None.

Response to other matters and recommended changes

Definition of vegetation clearance

235. Several people[64] submitted that the definition of vegetation clearance and the associated rules for vegetation clearance should apply to all vegetation types, not just

[62] Legal submission, paragraph 28
[63] On behalf on Transpower New Zealand
[64] For example, CEP Services Matauwhi Ltd, Northland Fish and Game, and Royal Forest and Bird Protection Society of New Zealand.

native/indigenous vegetation as recommended in the RMA s42A version of the Proposed Plan.

236. Having considered the submitters' submissions and evidence, I consider that the definition of vegetation clearance and the associated rules for the activity should apply to all forms of vegetation excluding grasses, scattered trees, shrubs, agricultural and horticultural crops, and the excluded activities in the RMA s42A definition of the Proposed Plan.

237. This is because the purpose of the vegetation clearance rule is solely to maintain and enhance water quality and aquatic ecosystem health.

238. Lynette P. Wharfe, for Horticulture New Zealand, explained that it would be useful (indeed appropriate) to exclude from the definition of vegetation clearance vegetation that is infected by an unwanted organism as declared by the Ministry of Primary Industries Chief Technical Officer or an emergency declared by the Minister under the Biosecurity Act 1993. Having considered Lynnette Wharfe's evidence, I now agree with Horticulture New Zealand's sought relief.

Rule C.8.2.1 (Land preparation)

239. Dr Craig Depree, on behalf of DairyNZ, recommended extending Condition 2 of Rule C.8.2.1, which does not permit land preparation within the catchments of outstanding lakes, to all dune lakes with outstanding and high ecological value.[65] I support this recommendation given that dune lakes are sensitive to phosphorus (associated with sediment). I consider that the recommendation should be adopted.

Rule C.8.5.1 (Temporary bore for geotechnical groundwater investigation, mineral exploration, or mineral extraction)

240. The Oil Companies requested that Rule C.8.5.1 be extended to provide for the construction or alteration of bores of contaminated land preparation as a permitted activity. After considering the evidence of Graeme Proffitt for the Oil Companies,[66] I

[65] Statement of Evidence of Dr Craig Verdun Depree for DairyNZ Limited. 8 August 2018. Paragraph 80, page 27.
[66] Statement of Evidence of Graeme Proffitt for Z Energy Ltd, Mobil Oil Ltd, BP Oil NZ Ltd (The Oil Companies). 10 August 2018.

recommend amending Rule C.8.5.1 so that it provides for the activity (subject to conditions).

Land drainage and flood control

Author: Michael Day

Hearing panel requests

241. None

Response to other matters and recommended shanges

Rule C.4.3 Repair and maintenance of a stopbank or floodgate – permitted activity

242. After considering evidence from Andrew Carvell[67] (paragraph 116), I recommend an amendment to condition 2) to add the following text *other than to provide for the settlement of earthen stopbanks*

243. I have given further thought to the evidence from G and P Morrison and while I am sympathetic to their request (to raise the height of stopbanks as a permitted activity to cope with future climate change induced sea level rise), I maintain the view that this is not appropriate as a permitted activity. I consider that the raising of stopbanks is an activity that would occur infrequently (i.e. not every year or two) and that the best way to manage the potential adverse effects of this activity is through the resource consent process.

Rule C.4.3A Repair, maintenance and clearance of a drain – permitted activity

244. After considering evidence from Rosemary Miller and Graeme Silver[68] (paragraph 101), I am recommending an additional condition to this rule to state that: *drain clearance activities are undertaken from upstream to downstream.*

[67] On behalf of Whangarei District Council
[68] On behalf of the Minister of Conservation

Rule C.4.4 Re-consenting flood control schemes – controlled activity

245. After considering evidence[69], I am recommending a minor 'tweak' to condition 5) to strike out reference to 'indigenous' (so that effects on all freshwater fish can be considered – excluding pest fish). This will also ensure consistency with other provisions in this section.

C.4.8 Land drainage and flood control general conditions

246. After considering evidence, I am recommending several amendments to the land drainage and flood control general conditions. Firstly, in response to evidence from Rosemary Miller[70] (paragraphs 56 and 58), I recommend an amendment to the end of condition 9) to include *but no later than one hour after their removal*.

247. In the Proposed Regional Plan s42A Recommendations version, I had recommended a new condition 14) related to freshwater crayfish and freshwater mussels unintentionally removed during clearing of drainage channels. I now consider that this condition can be merged into condition 9).

248. Lastly, in response to evidence from Andrew Carvell[71] (paragraph 121), I am recommending that condition 13) is amended by striking out clauses a) and b). This is because I consider that practically, operators have no control over sediment once it is discharged from the site.

249. I have given further thought to the request from Anil Shetty[72] to include the following condition – *any discharge does not contain concentrations of contaminants which have or are likely to have any more than a minor adverse effect on source water for human consumption as specified in the Resource Management (National Environmental Standards for Sources of Human Drinking Water) Regulations 2007).* However, I note that Mr Shetty did not provide any evidence demonstrating that discharges of contaminants from land drainage activities are likely to have a more than minor adverse effect on source water for human consumption.

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[69] From Northland Fish and Game
[70] On behalf of the Minister of Conservation
[71] On behalf of Whangarei District Council
[72] On behalf on Northland District Health Board

250. I therefore maintain the same position that I took in the Land Drainage and Flood Control s42A report – essentially, that this is not appropriate for a permitted activity condition for land drainage activities.

Policy D.4.26 - Land drainage

251. In response to evidence from Northland Fish and Game, I am recommending amending clause 5) to read: maintain the values of natural wetlands. In my s42A hearing report for Land drainage and Flood control, I recommended amending clause 6) to include the following text If land drainage leads to deteriorated or non-functional fish passages, new functional fish passage to fulfil the loss of passage is required. On reflection, I now do not consider that this addition is required as the clause already states that fish passage must be maintained. I therefore recommend striking out this text.

Livestock access to waterways and the coastal marine area

Author: Ben Tait

Hearing panel requests

252. The Hearing Panel asked Far North District Council and Whangarei District Council how far upstream of a public water supply take should livestock be excluded from permanently flowing artificial watercourses and rivers draining to the abstraction point, and the rationale for the distance.

253. Ruben Wylie and Jessica Crawford answered, on behalf of the district councils:[73]

Our research indicates that detailed empirical work is generally required to establish appropriate setbacks and protections zones to limit the risk of discharge activities on drinking water supplies. In lieu of any detailed modelling of risk and specific protection zones, we recommend, in line with the ECAN plan, protection from discharges and from animals in the bed and banks of rivers 1,000m upstream of a water take point.

[73] Supplementary Evidence of Ruben Wylie and Jessica Crawford. Respose to Panel Questions. 2 October 2018. Paragraph 60, page 12.

254. I support the conclusion and recommendation of Ruben Wylie and Jessica Crawford and consider that Rule C.8.1.1 should be amended by including a new condition that requires livestock to be effectively excluded from a water body for a distance 1,000 metres upstream of a public drinking water supply intake servicing more than 25 people.

Response to other matters

īnanga spawning sites

255. Natasha K. Petrove stated in her evidence, on behalf of the Minister of Conservation:[74]

> *Grazing from livestock at īnanga spawning sites reduces the protective properties of riparian vegetation (by reducing vegetation height and density), and significantly reduces spawning success (Hickford & Schiel 2011a). For example, Hickford & Schiel (2011a) found that shorter and less dense grazed vegetation was not as effective at buffering temperature and fluctuations in humidity as ungrazed vegetation. Survival of īnanga eggs was three times lower in grazed vegetation, while egg densities were ten times lower. This showed that not only was īnanga egg survival reduced in grazed areas, but also that īnanga had a lower egg production in grazed areas.*

256. Natasha K. Petrove goes on to recommend that livestock should be excluded from īnanga spawning sites.

257. It is important to note that Rule C.8.1.1 requires pigs, dairy cows, beef cattle, dairy support cattle and deer to be excluded from permanently flowing rivers, streams and artificial watercourses (>1 metre wide) and Rule C.8.1.3 classifies the access of the livestock to the coastal marine area as a non-complying activity. Therefore, I consider that the Proposed Plan provides adequate protection for īnanga spawning sites and an additional condition in Rule C.8.1.1 or a standalone rule is not warranted.

Effective exclusion

258. Debra A. Bidlake, on behalf of Federated Farmers of New Zealand, sought "assurances that [single polymer wire fencing] satisfy the permanent fencing

[74] Statement of evidence of Natasha Katherine Petrove on behalf of the Minister of Conservation. 10 August 2018.

requirements so that [members of Federated Farmers] can farm with confidence that they comply with the PRP."[75]

259. Having considered the evidence, I am satisfied that single polymer wire fencing can be used as an effective permanent fence and recommend that the definition of "Effectively excluded" be amended to recognise this.

Mangrove management

Author: James Griffin

Hearing panel requests

Staff to provide advice on which part of NZCPS Policy 11 mangroves themselves (not birds) fit into.

260. Mangrove habitat values can range dramatically depending on their maturity, scale and the ecological context they are found in. There are therefore, several attributes listed in Policy 11 that may apply, as listed below with examples:

NZCPS Policy 11 parts that may apply to mangroves	**Example**
11(a) … (v) areas containing nationally significant examples of indigenous community types; and	e.g. Parengarenga Harbour SEA assessment sheet "*Habitat sequences excellent, salt marsh, mangrove, tidal flat and seagrass beds and subtidal channels, is an important estuary on East Coast and nationally significant*"
11(a) … (vi) areas set aside for full or partial protection of indigenous biological diversity under other legislation; and	e.g. The 228ha Whangarei Harbour Marine Reserve at Waikaraka which is almost entirely mangrove forest.
11(b) … (i) areas of predominantly indigenous vegetation in the coastal environment;	The Mangrove (*Avicennia marina subsp. australasica*) is a native species[76] and therefore, indigenous vegetation

[75] Debra A. Bidlake on behalf of the Nortland Province of Federated Farmers of New Zealand. Advocacy and Farmer Submissions. September 2018. Paragraph 12, page 4.

[76] New Zealand Plant Conservation Network: http://www.nzpcn.org.nz/flora_search.aspx?scfSubmit=1&scfLatin_Common_Name=mangrove

NZCPS Policy 11 parts that may apply to mangroves	Example
11(b) …(ii) habitats in the coastal environment that are important during the vulnerable life stages of indigenous species;	Numerous species utilise mangrove habitat at different life stages, whether these life stages are *vulnerable* and the habitat *important,* is open to interpretation. For example, bird and fish species that are associated with mangrove habitat, are also found in other habitat[77]. This point is highlighted throughout MHRS expert evidence e.g. MHRS, Don. Para. 6.13. I do not therefore think mangrove values generally fit into 11(b)(ii), particularly not small mangrove areas. However, I cannot rule this out in the future, given the scale of some mangrove forest in Northland such as in Parengarenga Harbour.
11(b) … (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;	Mangroves are indigenous, only found in the coastal environment and are coastal wetlands. While some may say that areas where mangroves are expanding in area indicate they are not '*vulnerable to modification*', mangrove area can also reduce because of modification e.g. causeway construction, reclamation, root damage.
(v) habitats, including areas and routes, important to migratory species; and	I'm not aware of any direct importance that mangrove habitat has to migratory species, however mangrove forest can screen migratory birds from activities that may otherwise disturb them.
(vi) ecological corridors, and areas important for linking or maintaining biological values identified under this policy	Mangroves can play an important buffering and ecological role in estuaries e.g. role in estuaries e.g. Te Haumi Estuary and Parengarenga Harbour SEA assessment sheets.

Does Policy D.5.24 1)a) relate to the mangrove or adjacent habitat?

[77] Lundquist, C., Carter, K., Hailes, S., Bulmer, R. (2017) Guidelines for Managing Mangroves (Mānawa) Expansion in New Zealand. *NIWA Information Series* No. 85. National Institute of Water & Atmospheric Research Ltd. http://www.niwa.co.nz/managingmangroveguide

261. It relates to “disturbance, displacement or loss of ...” any habitat associated with the mangrove removal activities, including potential off-site adverse effects, but most of the impact is likely to be within the area of removal.

Response to other matters and recommended changes

Rule C.1.4.1 - Mangrove seedling removal – permitted activity

262. I recommend the following changes:

263. Deleting “*the use of motorised machinery to transport people, tools or removed mangrove vegetation”*. I accept the evidence of Graeme Silver (Minister of Conservation) that this activity is adequately covered by C.1.5.1.

264. Amend C.1.4.1(2) so that the restriction on removing seedlings is limited to the canopy of mature mangroves (instead of amongst the aerial roots). I am willing to accept the evidence of A La Bonte (for Mangawhai Harbour Restoration Society) that the rule would be too restrictive given the sometimes large (20m+) distances aerial roots can extend out from a mature mangrove and that the experiences to date that seedling removal amongst aerial roots has not been detrimental to mature mangroves. Therefore, an additional general condition (17A) is recommended to ensure damage to aerial roots is minimised (when mature mangroves are not being removed).

265. Amend C.1.4.1(4) to reduce the times of the year when motorised hand-held tools cannot be used from 1 August to 31 March, to 1 September to 28 February. Graham Don (for Mangawhai Harbour Restoration Society) provided evidence to support this change and there was no convincing evidence providing a contrary view.

Rule C.1.4.2 - Minor mangrove removal – permitted activity

266. I recommend the following changes:

    - Increase the distance around the footprint of boat ramps and jetties where mangroves can be removed from five metres, to 10 metres, based on the evidence of Bay of Islands Planning et al which outlined the need for a larger area for operational and safety reasons.

- Various minor changes to the table *Maximum allowable area of mangrove removal* to improve clarity.

Rule C.1.4.3 - Mangrove removal – controlled activity

267. I recommend the following changes:

268. Adding a new clause 4 to provide a controlled activity for the replacement of existing resource consents. I suggest this in response to Mangawhai Harbour Restoration Society evidence requesting a 'zoning' within Mangawhai Harbour, and believe this is equally valid to replacement consents elsewhere in the region. However, I recommend this only applies to applications made before expiry of the existing consent and where there is no change to the authorised activities.

269. Addition of "*Effects on birds classified as Threatened or At Risk under the New Zealand Threat Classification System*" as an additional matter of control, with reference to known threatened and at-risk species identified by reports supporting the significant bird area maps.

Rule C.1.4.6 - Mangrove removal – non-complying activity

270. Mangawhai Harbour Restoration Society[78] oppose non-complying status as, "*From a scientific perspective, there is no justification for this additional restriction*", however there are mapped areas of both Outstanding Natural Character and also Significant Ecological Areas where mangroves contribute to those mapped values. Therefore, as the NZCPS avoid regime applies, I consider it is justified to apply a 'non-complying' status and therefore recommend no change.

Policy D.5.22 - Mangrove removal – purpose

271. I recommend minor points of clarification and the following changes:

- Clarification that decisions on mangrove removal are subject to Policy D.2.7 (Managing adverse effects on indigenous biodiversity), as requested by the Royal Forest and Bird Protection Society of New Zealand Incorporated.[79]

- Clarifying that consideration to habitat displaced by mangroves is a relevant consideration as requested by Mangawhai Harbour Restoration Society.[80]

[78] MHRS, LaBonte, Para. 6.31
[79] Forest and Bird, Anderson, Legal Sub. Para. 59
[80] MHRS, Coffey, para 9.5

- Including consideration to areas where mangroves have been previously lawfully removed as requested by Mangawhai Harbour Restoration Society.[81]

Policy D.5.24 - Mangrove removal – adverse effects

272. In consideration of points raised by the Minister of Conservation[82], I suggest insertion of "have regard to", and broadening scope to include, 'potential' adverse effects, places an appropriate level of precaution on this policy.

273. I suggest some other minor amendments for clarification and an additional point (aa) in consideration of matters raised by the Royal Forest and Bird Protection Society Incorporated[83], that highlights the need to consider Threatened or At Risk birds and provides lists of those species associated with each estuary, stretch of coast as well as some broadly dispersed seabird species.

Marine pests

Author: James Griffin

Hearing panel requests

Staff to please advise whether rule C.1.7.2 should be amended to allow in-water cleaning on a grid.

274. Yes, provided the grid is consented, as there are numerous unconsented grids that are not managed, monitored and are in various states of disrepair.

Is there a case to revise copper levels in appendix H.5.4 sediment quality standards where in-water cleaning is allowed?

275. Not currently, however the monitoring programme is due to be expanded in line with the scale and locations of increased in-water cleaning.

[81] Mangawhai Harbour Restoration Society
[82] DOC, Silver, para 137
[83] Forest and Bird, Anderson, Legal Sub. Para. 54

Response to other matters and recommended changes

Rules C.1.7.1 and C.1.7.6

276. The MPI and DOC[84] provide a convincing argument for these rules being unnecessary, therefore I recommend their deletion.

Insert a note referring to the "Anti-Fouling and In-Water Cleaning Guidelines-June 2015"

277. MPI[85] request that the Marine Pest section provides reference to the above guidelines. I agree that the guidelines provide useful best practice advice and therefore recommend an additional note.

Rule C.1.7.2

278. I agree with the DOC[86] request to include structures within this (and other) rules, to provide an incentive for structures to be maintained and provide a consistent approach to in-water cleaning controls.

279. I disagree with the DOC and MPI[87] request for an additional clause 1) requiring the anti-foul coating on the vessel, niche area or moveable structure to not exceed its planned in-service life, as specified by the manufacturer (as demonstrated by the provision of a receipt showing the date of anti-foul coating application). While in theory this seems a logical request, Council marine biosecurity staff have advised me that this is not practical, because:

- Not all vessels and few structures have an anti-foul coating, and
- When monitoring "in-water cleaning", key potential adverse effects are of marine pest or hazardous substance release. Pursuing proof of anti-foul application date, is somewhat "off topic".

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[84] Minister of Conservation, Hucker, para 46 and 50; Ministry of Primary Industries, Walls, para 15

[85] MPI, Walls, para 41
[86] DOC, Hucker, numerous references
[87] DOC, Hucker; MPI, Walls, para 55

280. The service life of some antifouling paints can be 10 years (*coppercoat*) but this doesn't preclude the growth of biofouling or marine pests. Also, ablative paints rely on vessels being used frequently for the paint to be effective. Paints are also, broadly made for a region e.g. asia-pacific, there are often issues with paints in localised areas such as has been seen with rapid barnacle growth in the Bay of Islands in the last 3 years. Some manufacturers have admitted that the paint isn't working to the desired standard in this situation.

281. I recommend amendment to clause 4) because of highlighted inconsistency (DOC[88]) between Rule C.1.7.2 and C.1.7.3. I recommend that in-water cleaning remains restricted from within 50m of Significant Ecological Areas, and that the need for this clause remains, as there are some mooring zones that coincide (in part) with Significant Ecological Areas.

282. Regarding clause 5) I accept that deletion of the 25m vessel length restriction, removes an unnecessary restriction, as requested by DOC[89] and other submissions.

283. I do not agree with MPI and DOC requests to limit in-water cleaning to slime layer only or goose barnacles. Council marine biosecurity staff have advised me that a slime layer only OR goose barnacles would preclude effective in-water hull cleaning in Northland, and therefore run counter to what DOC and MPI want to achieve. As mentioned, barnacles can colonise hulls in the Bay of Islands in 3 weeks, mud/sediment is present within 1 month in the Mangonui Harbour. If we want vessel owners to keep their vessels clean to prevent biofouling reaching a threshold where marine pest species could be present, this needs to remain as 'light fouling'. The objective is to keep clean vessels clean. In addition to this, there are no pest barnacle species listed as 'unwanted organisms' by MPI. This rule may be appropriate for a national border standard but not for a regional rule.

284. As requested by both DOC and MPI, I agree with amendments to clause 7, so that notification requirements include the Ministry for Primary Industries, given the responsibilities of that Ministry.

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[88] DOC, Hucker, para, 59
[89] DOC, Hucker, Suggested amendments Appendix 1

Remaining Marine Pest Rules C.1.7.3 to C.1.7.5

285. I recommend consequential amendments to the remaining rules in this section to maintain a consistent approach as that described above and to provide further clarification.

Moorings and anchorage

Author: Michael Payne

Hearing panel requests

Provide a map showing the areas where the marine pollution regs restrict sewage discharges and differentiate these from the proposed additional sewage restriction areas in the Proposed Plan.

286. A GIS viewer displaying the information requested by hearing panel is available by following this link .

Yachting NZ – anchoring and sewage discharges from vessels

287. Yachting NZ raised concerns about the enforceability of the proposed anchoring rules, and, being able to demonstrate the amount of time a vessel has been at anchor. Yachting NZ also raised questions about the rationale for extending the areas where the vessel sewage discharges are limited beyond the default set by the Resource Management (Marine Pollution) Regulations 1998. Both these issues are covered in a report by Ricky Eyre, the councils Costal Monitoring Manager[90]. In summary, Mr Eyre believes the rules restricting anchorage are enforceable and that the proposed extension to the vessel sewage discharge restriction areas are justified.

288. In addition to Mr Eyre's views, I also have some comments on Yachting NZ's views. Mr Brabant states in paragraphs 80 of his legal submission that the operative Regional Coastal Plan sewage rules align with the marine pollution regulations. This is further commented through paragraphs 96-99, and concluded in paragraph 126. This is not the case. The operative Regional Coastal Plan extended the regulations "no

[90] See Appendix 1 for full details

discharge limits" to include all of Northland's estuaries, including Whangarei Harbour, and extended the "limits" within the Bay of Islands and Kaipara Harbour – this is shown in these maps.

289. The rationale for extending the Marine Pollutions Regulations default areas is outlined in detail in the Section 32 report[91] and in the s42A report[92], and I continue to stand behind these reasons and recommendations.

Policy D.5.9 - Managing the effects of moorings outside mooring zones

290. I support the amendments requested by GBC Winstone based on the evidence provided by in paragraph 9.26 of Ms. Clarke's evidence to include mooring associated with commercial activities in the policy.

291. In his submission Mr Mace comments on the activity status for existing moorings where there is more than one mooring associated with a property and the use of the "no more than minor adverse effects" test in the associated policy.

292. Mr Mace seeks relief to make all existing moorings permitted activities. I disagree with this position and maintain that a discretionary activity status is appropriate for the reasons set out in the Section 32 Report for moorings and anchoring.

293. Mr Mace also expresses some concern about applying a "no more than minor adverse effects" test to existing moorings. While I believe this test is entirely appropriate for new moorings and is an important tool to help manage the proliferation of moorings. I share some concerns about how this clause will apply to some existing moorings. However, no submitters provided an alternative policy in submissions or evidence. Due to time constraints, I have not developed an alternative policy for the committee's consideration.

Policy D.5.17 - Marinas and moorings in high demand areas

294. Several submitters provided evidence seeking to delete the reference to Mangawhai in Policy D.5.17. Based on the information provided by submitters[1] I recommended that all references to Mangawhai be deleted from this policy.

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[91] Page 117
[92] Page 11, S42 report – Moorings and anchorage
[1] NZ Fairy Tern Trust, Rogan, page 8; DOC, Beauchamp, paras 29 to 44; McConchie; Mangawhai Waka Ama

General

295. I have recommended minor changes to the policies and rules for mooring and anchoring to improve readability and to make the language in this section consistent with similar terms and phrases used in other parts of the Proposed Regional Plan.

Other discharges of contaminants to land and water

Author: Ben Tait

Hearing panel requests

296. None.

Response to other matters and recommended changes

297. None.

Re-building of materially damaged or destroyed buildings

Author: Michael Day

Hearing panel requests

298. None

Response to other matters and recommended changes

299. None

Regionally significant infrastructure, renewable energy and economic wellbeing

Author: Jon Trewin

Hearing panel requests

Legal advice please – For areas or values where the NZCPS (Policy 11(a), Policy 13(1) and Policy 15) clearly requires the avoidance of effects, does the NPSET (Policy 8) or any other higher order policy mean that a strict avoidance of effects approach does not need to apply to RSI in general, and in particular the National Grid. Please consider RFBPS v BOPRC (High Court decision).

300. The relevant legal advice has been attached in Appendix 2. In summary, the advice was the Regional Plan must give effect to both by seeking to reconcile the different policies and the Hearing Panel applying weight to the policies as it sees fit (whilst not diluting down directive policies). This does not apply to other regionally significant infrastructure where it should be provided for where appropriate but not all locations in the CMA will be appropriate. In general, where tension exists between competing policies, a process should be taken to try and determine and then narrow the areas of conflict, noting that provisions expressed in more directive terms will carry more weight than those expressed in less directive terms. NZCPS Policies 13 and 15 are two such policies that have strong direction and require positive implementation.

Response to other matter and recommended changes

301. Whangarei District Council (Wylie) and Far North District Council (Crawford) are concerned that Policy D.2.2D (Managing adverse effects arising from regionally significant infrastructure) does not allow the implementation of the gateway test for non-complying activities under S104D. The clause of concern is c) *'other adverse effects are avoided, remedied or mitigated to the extent they are no more than minor'.* It is noted that this policy was taken from the RPS for Northland, which included an explanation of how it operates and without this there might be some confusion. The first limb (1) of the policy is to allow minor effects arising from the establishment and operation of regionally significant infrastructure, whilst noting that certain restrictive policies (natural character, significant biodiversity etc..) may not allow minor adverse effects. The second limb (2) attempts to do something similar with maintenance and upgrading. Both these limbs serve to allow the smooth passage of straightforward proposals. The third limb (3) is a list of considerations that apply in general to regionally significant infrastructure proposals though in practice would apply primarily where limbs 1 and 2 of the policy cannot be met. To avoid confusion, I am proposing to separate out this policy into three separate policies. Several other clarifications to the text of the policy are proposed. I also support evidence presented by Transpower

(Whitney) to include a clause on avoiding, remedying or mitigating adverse effects through route or site selection methods and a change proposed by NZ Refining to reference the coastal marine area and resources (as opposed to just land).

302. I support Transpower (Whitney's) request to include a policy on protecting regionally significant infrastructure assets.

303. I propose several clarifications to Policy D.2.2F on renewable energy including the inclusion of the word 'pressure' - as recommended by the NZ Geothermal Association.

Significant natural and historic heritage

Author: Jon Trewin, James Griffin and Vince Kerr (SEA consultant)

Hearing panel requests

Clarify whether legal advice for managing land-based effects applies to permitted activities.

304. Staff sought additional legal advice on this matter from Wynn Williams (Counsel). The full legal advice is attached (see Appendix 2). In summary, it was confirmed that so long as rule criteria relates to controlling the effects of the use of land in the CMA and outside the CMA (providing the effect is associated with an activity in the CMA regulated by the relevant rule) it is valid.

Re paragraph 126.1 in the reply to hearing panel questions, provide panel with draft actual wording from each of the alternative options for us to consider re Policy D.2.8?

305. The alternative suggested formats for this policy are as follows:

- Approach that references the RPS:

D.2.7 Managing adverse effects on indigenous biodiversity

Manage the adverse effects of activities on indigenous biodiversity by:

1) Avoiding, remedying or mitigating adverse effects as outlined in Policy 4.4.1 of the RPS for Northland (link).

2) recognise areas of significant indigenous vegetation and significant habitats of indigenous fauna include:

a) Significant Ecological Areas....(etc)

- Approach that splits the policy in two:

D.2.7 Avoiding, remedying or mitigating adverse effects on indigenous biodiversity

Avoid, remedy or mitigate adverse effects on indigenous biodiversity in the following way:

1) In the coastal environment:

a) avoid adverse effects on:

i) indigenous taxa that are listed as Threatened or At Risk in the New Zealand Threat Classification System lists (etc...)

D.2.8 Methods to avoid, remedy or mitigate adverse effects on indigenous biodiversity

1) recognise areas of significant indigenous vegetation and significant habitats of indigenous fauna include:

a) Significant Ecological Areas....(etc)

Response to other matters and recommended changes

Significant Ecological Marine Areas

306. I agree with the request[93] to amend the Significant Ecological Area Marine Assessment Sheet for both Waikino Inlet and Kaipara Harbour Marine Values to add "*The Significant Ecological Marine Area contains oyster aquaculture*" to the Summary. Staff discussed with Wynn Williams (Counsel) the legality of amending assessment sheets through the Hearings process (i.e. do they form part of the plan?). Counsel believe that they do form part of the plan as documents incorporated by reference (this advice was received verbally) and staff have accepted that advice.

Significant and Important Bird Areas (SBA's and IBA's)

307. I recommend amendment to text that refers to significant bird values by referring to Threatened and At Risk bird species including as referenced by the "Significant Bird Area" and "Significant Marine Mammal and Seabird Areas" maps. The assessment sheets that are referenced to these maps provide easy access to useful lists of Threatened and At Risk species. The identified 'seabird' species understandably relate to large scale areas and include the Forest and Bird Important Bird Areas, however, 'shore birds' species lists are specific to individual estuaries and discrete coastline sections. I believe this is very useful information, and recommend changes to text that better reflects the value of identified Threatened and At Risk species. This also provides some relief to matters raised by the Royal Forest and Bird Protection Society

[93] *Amanda Hills legal submission, Para 153, and subsequent Memorandum of Councel for Aquaculture New Zealand Limited, the New Zealand Oyster Industry Association and Moana New Zealand Limited, dated 10/10/18, Para 7*

Incorporated[94], that highlights the need to consider the habitat of Threatened or At Risk birds.

308. In addition, the Forest and Bird Important Bird Areas "*are sites that are recognised as internationally important for bird conservation*". As mentioned above, these areas are included in the PRP seabird report that includes the IBA's (Table 3) identified in Northland, as well as a map indicating species richness (Figure 1). Because of the dispersed nature of 'seabird (and marine mammal)' values, the mapping was used as a tool to reference these values and threatened and at risk species known to be present (see the Significant Ecological Marine Area Assessment Sheet.

309. Were identified bird values to be limited to the IBA's (excluding offshore islands), it would fail to recognise 'regionally' and 'nationally significant' values. Also, the focus of the IMA's is on 'Seabirds' i.e. this does not include other bird groups (land, shore and water birds). It is a common misconception that shore and water birds are seabirds.

310. I recommend the term 'ecological complexes' for deletion in acknowledgement of Paragraph 11 of Hearing evidence from Jeff Kemp on behalf of Bay of Islands Planning Limited, Far North Holdings Limited, Broadspectrum NZ Ltd, which seeks deletion of 'ecological complexes' as not specifically referred to in relief sought by forest and Bird. In addition, I accept this term has limited value being only referred to in policy and not rules.

Bird breeding, roosting and nesting period amendment

311. I accept the Mangawhai Harbour Restoration Society (MHRS, Dons, para, 5.3) argument requesting amendment to shorten the period by a month at each end, so that the period is 1 September to 28 February (inclusive). Therefore, I recommend according amendments to conditions referring to this period.

Definition of a shellfish bed

312. I suggest the definition that is presented by Mark Poynter originating from a Fisheries Management perspective is not all that useful or appropriate. We are concerned here with significant communities in an ecological sense. There is no set convention that I am aware of for defining what is and isn't a shellfish bed but what is usually used is an

[94] Forest and Bird, Anderson, Legal Sub. Para. 54

ecological definition where a community is defined by its most common or dominant in terms of spatial distribution and biomass species. This convention is used in characterizing and classifying terrestrial habitats and communities as well. In addition, there could be a simple guideline that 50% of the area in questions has the species present.

313. Stating a rule around densities/m3 or makeup of size classes could be inappropriate for this purpose because shellfish beds are highly variable and change over time and in their spatial distribution at fine scales. I acknowledge that the fisheries definition has practical use and value if you are managing harvest, but is not a best approach to an ecological definition.

Response to Refining NZ evidence requesting removal of Mair Bank and the Marine Mammal and Seabird SEA areas

(Author: Vince Kerr[95])

314. Essentially, I stand on the previous response to submission report.

315. I don't believe Bridgette Munro has introduced anything new just stating her opinion about interpretations of context which I do not agree with.

The issue of combining Seabird and Marine Mammal significant values

316. This is (as I stated in last recommendation) a non-issue, the layers were not done together they are two layers so in reality this is not an argument. Also, the information behind the two layers is quite different – the bird layer has much more detailed information around the coastal area and islands but does suffer the same problem as the marine mammal layer in the offshore area where bird feeding is dispersed over virtually the entire area.

Dr Clement's marine mammal evidence

Use of or definition of significance ranking, and how to do this with marine mammals.

317. In her submissions, she makes a good case about how we could improve the information database we have for the various species of concern.

[95] Consultant engaged by council to map the significant ecological areas.

318. I have no argument that more information is certainly a desired goal.

319. Then she forms an argument around the idea that we are not correct in the way we are applying the classification of significance. She is saying that essentially it should have a high threshold for example a spatial area where a known frequency of essential or crucial habitat use (like feeding) takes place. This assumes that this specific use can be weighed against all the other areas used in the home ranges of the animals to assess importance and therefore significance.

320. She then argues that the classification brings with it, policy and management restrictions to 'avoid' impacts under the NZCPS and thus must fit this sort of criteria of specific importance to the species functioning etc. She then states that we have a long way to go to meet this sort of certainty of ecological information in a spatial sense.

321. While I agree in principle with everything she is saying, I think there is merit in having something like what we have, because it draws attention to how wide-spread their use of the marine space is and also signals that we must take into account their presence and use of these habitats.

322. So, I am not in disagreement with her review of the mapping effort and the need to improve the underlying data. However, I don't think doing nothing, is the best way forward, because the argument works both ways.

323. Taking Orca as an example, we have records of them feeding in virtually all Northland estuaries. We have no way on knowing that a disruption to that feeding activity could have a significant effect on part of the population. In this instance, the precautionary approach would dictate that we take this risk in to account at all times and avoid this sort of disturbance. Having this need recognised in a spatial extent, I therefore argue is important, worth doing and signalled by the NCPS.

How to apply policy and rules etc to this context and mapping approach.

324. Notwithstanding the obvious problem of mapping marine mammal areas of significance, it seems that the management or policy questions around having this layer are the crux of the submissions. Rather than throwing out the information layer in its current form I would suggest that these policy and rule concerns are addressed in some succinct way that is acceptable in terms of creating a flag that these disperse values are important and must be taken into account by all that we do in this marine space without being overly specific or restrictive or in other words would lead to a case

by case assessment which is very close to the current or default position. The difference being that we have started the information system and raised awareness of the need to be aware of these species.

325. Bridgette Munro states the formulation of the marine mammal SEA layer is not based on scientific evidence. In our process two marine mammal experts were consulted as co-op members of the expert group, both of which have extensive Northland research involvement and experience. Also, literature was reviewed and the NZ marine mammal siting's database was queried. Further I have 30 year's experience working on the Northland coast and Whangarei Harbour which includes many specific observations. To this body of information our criteria process was applied. Our evaluation or information list in fact is not that different from the one described by Dr Clement when she is explaining how she evaluates significance.

326. A further note: Dr Clement makes a strong point about the difference between the presence of species in an area, and use of species habitat area, which is important or crucial to their wellbeing. She seems to assume that we only looked at presence and not what we knew about specific use in spatially defined areas, such as the Orca example. So, her argument is fair comment to some degree at large scales, however there were examples where we were looking at specific behaviours that could be considered important, although establishing hard lines around ecological significance of behaviour and spatial extent remains a really challenging task. Dr Clement is saying we should do it but in reality, it is too big a task at the scales we are talking about and the range of species we are concerned with. This is classic example of where a precautionary approach is called for.

327. Regarding the specific area around Bream Bay and Whangarei Harbour. Dr Clement seems to dismiss the importance of Orca use as 'just presence' and therefore not significant. If that argument were to be made it would have to be justified, as there are many local accounts of Orca feeding in the harbour as well as published accounts. There would have to be an argument made that feeding there is not significantly important to the species, which she has not done.

328. The Bridgette Munro argument para 7.21 on RFNZ consent being approved and difference between NZCPS 11(a) and 11(b). I would say she is splitting hairs here, and I think contradictory, as in the RNZ AEE (Coffey is recognizing the significance). Also, direction of the consent regarding Mair Bank is consistent with 11(a) and Bridgette

Munro is saying in her opinion it reflects 11(b), but this is not supported by any detail. Adverse effects are in fact being avoided at Mair Bank as proposed in the AEE.

329. Summary: there are some valid points made in these submissions, especially in Dr Clements efforts to rationalize where we should go with spatial mapping of marine mammal significance. She signals import future work there. In terms of the current map layers, my opinion is that on ecological grounds, and considering that this is a first effort and meeting the guidelines set down in the NZCPS, I would suggest that as long as the context of layers is made clear and not used in inappropriate ways to direct policy or rules, that they are an appropriate first step in this process. This process will evolve over time as better systems, clearer definitions, and more ecological data, comes to hand.

Rule C.1.1.7 Reconstruction, replacement, maintenance or repair of a structure – permitted activity

330. I recommend several minor changes to Rule C.1.1.7. Reconstruction, replacement, maintenance or repair of a structure – permitted activity. This includes (5)a) by clarifying through a footnote that 'rendering' generally refers to applying plaster to a surface and fabric refers to the 'cladding' of the building. I also recommend deleting d) (as it is a repetition of other conditions) and adding footnotes to conditions f) and g) to improve their clarity.

Rule C.1.1.13 (Works to a Historic Heritage Site within the scope of a management plan)

331. I have reviewed evidence presented by submitters on Rule C.1.1.13 (Works to a Historic Heritage Site within the scope of a management plan). I have reservations about deleting the requirement to have the plan agreed to by Heritage NZ (Clarke – GBC Winstone). Heritage NZ are the acknowledged authority on heritage matters. Given the wide range of activities that would be covered by this rule (reconstruction, replacement, maintenance, repair, removal) as a controlled activity there needs to be safeguards in place to prevent inappropriate activities. If the Hearings Panel are minded to delete this requirement then I would strongly recommend the rule becomes restricted discretionary and retaining matters of control (or discretion) 2-4. Council are likely to want to consult with Heritage NZ for these activities who could provide critical advice on the historic heritage management plan prepared by the applicant and any likely effects on historic heritage values.

Policy D.2.6 (Historic Heritage)

332. I recommend several changes to Policy D.2.6 (Historic Heritage) for clarities sake. This includes adding '...*with statutory heritage protection functions*' to the end of 4)b)ii), amending 5)g to include '*the stabilisation, preservation and conservation principles*' and amending 7)a to clarify that listed items in this plan are actually those 'mapped' in the plan.

Policy D.2.7 Natural Character, Outstanding Landscapes and Features

333. Ngawha Generation Ltd sought the insertion of an additional clause in Policy 2.7 (Natural Character, Outstanding Landscapes and Features) to avoid significant adverse effects on outstanding natural features that are geothermal features where practicable, or otherwise remedy or mitigate these adverse effects. To support this change, they pointed to the existing use of the geothermal features for the generation of geothermal energy as an appropriate activity. Under Section 6 RMA, it is a requirement to protect outstanding natural features from 'inappropriate' subdivision, use and development. The Regional Policy Statement for Northland 2016 (Policy 4.6.1) goes a step further and requires that significant adverse effects on the *characteristics and qualities* of outstanding natural features outside the coastal environment are to be avoided. The characteristics and qualities of the Ngawha Geothermal Field are summarised in Bruce Hayward's Report on Outstanding Natural Features in Northland (updated May 2016). In my opinion, making the requirement to avoid significant adverse effects only 'where practicable' and relying on remediation and mitigation is inconsistent with this direction in the RPS. The submitter references unavoidable temperature and chemistry changes that may occur as part of an activity using energy from the geothermal field. Significant changes which degrade the characteristics and qualities of the geothermal field to the point at which it is not likely to be outstanding is, in my opinion, inappropriate development, inconsistent with both RMA Section 6 and RPS Policy 4.6.1.

334. I also recommend some minor clarifications in Policy D.2.7. 2). I accept the point by NZ Transport Agency at the hearing (Heppelthwaite) about needing to recognise existing activities and the effects they may already have. This is also relevant for Policy D.2.8 (indigenous biodiversity) and therefore I recommend a similar clause in this policy.

Policy D.2.8 (Indigenous Biodiversity)

335. I also recommend some changes for clarity to Policy D.2.8. (indigenous biodiversity). Notably this includes the word '*significant*' in the introduction to 1) before '...*habitats of indigenous fauna*'. This word was inadvertently left out of the clause. Several other clarifications are recommended – for example replacing 'likely' with 'potential' adverse effects in limb 2 of the policy.

336. I recommend that additional wording is inserted into Policy D.2.8. 1A b)i) that areas of indigenous vegetation do not include areas of mangroves to be pruned or removed for one of the purposes listed in D.5.22.

D.2.9 (Managing adverse effects on land-based values and infrastructure)

337. I recommend some clarification changes in Policy D.2.9 (managing adverse effects on land-based values and infrastructure) to provide direction to decision makers when considering the policy.

Old Portland Wharf

338. GBC Winstone maintain that the old wharf at Portland should be deleted from the planning maps. I have read the evidence presented at the hearing (Hall) however no heritage assessment or other evidence that disputed the wharf's listing was presented by the submitter. Its listing in the plan is based on work undertaken by Clough and Associates where it met the criteria (from the RPS and regional plan assessment sheet) to be included. This built on work undertaken previously by Bill Edwards, Northland Area Manager for Heritage NZ who assessed the wharf as 'at risk' industrial heritage. Therefore, as no contrary evidence had been presented, I cannot change my recommendation that the wharf is historic heritage that should be included in the regional plan.

Geothermal surface features

339. In response to the evidence by the NZ Geothermal Association, I recommend the insertion of a definition for 'geothermal surface feature' as described in their primary submission. I also recommend several changes to the rules based on NZ Geothermal Association's submission including Rule C.5.1.1 (Minor Takes), C.6.4.1 (Stormwater discharges from a public network), C.6.6.1 (Discharge of cooling water), C.8.3.1

(Earthworks), C.8.5.1 (Temporary Bores). These changes are detailed in the staff reply changes to the plan text.

Policy D.5.27 – Significant surf breaks

340. The Surfbreak Protection Society of New Zealand are seeking amendments to state that adverse effects on Nationally Significant Surfbreaks are avoided. This is consistent with policy in the New Zealand Coastal Policy Statement 2010. I recommend that these amendments are adopted by the Hearing Panel.

Solid waste

Author: Michael Payne

Hearing panel requests

Staff to comment of feasibility of including requirement in permitted activity rule (C.6.7.3) for land owners to register what they are dumping in their farm dumps. Also, whether staff still support recommendation to delete condition for the location of dumping (as per parag 133.3, "Hearing Panel S42A questions and council staff response").

341. I agree with the statement from Love Kaipara that keeping a record of waste being disposed of in farm dumps could be a useful tool to prompt changes in behaviour. However, I have some concerns around the appropriateness of a requirement of this nature for a permitted activity rule. When imposing permitted activity conditions, we must be mindful of whether the condition is reasonable and practical. I would expect wide spread non-compliance if a condition of this nature is recommended by the Hearing Panel. Colleagues in NRC's Farm Dairy Effluent and Waste and Water monitoring teams expressed similar views.

342. On that basis, I do not believe it is practical to adopt the relief sought or realistic to expect compliance with this type of condition.

343. I maintain, that clause 10 of Rule C.6.7.3 should be deleted, as stated in the response to the Panels earlier question.

Response to other matters and recommended changes

Definition – Cleanfill material

344. In his evidence (paragraphs 172 -187) Mr Carvell (on behalf of Whangarei District Council) discusses the reasons why the definition of *"cleanfill material"* should be amended to reflect similar definitions in national guidelines.

345. I agree with Mr Carvell and recommend that the Proposed Regional Plan adopts the definition of "*cleanfill material"* from *Technical Guidelines for Disposal to Land, 2016.*

C.6.7.2 Discharges to land from closed landfills

346. Rule C.6.7.2 seeks to manage the discharge of contaminants to land from closed landfills. The Proposed plan sought to manage these discharges as a permitted activity. Following the receipt of submissions, the 42A Report proposed to amend the activity status to a controlled activity.

347. In his evidence Mr Carvell suggests that a better approach may be to reinstate the permitted activity status for closed landfills that are considered to have low environmental risk when assessed in accordance with the Ministry for the Environment's risk screening system.

348. This approach has been adopted by Southland Regional Council. Discussions with Southland Regional Council staff indicate that the rule is working well. However, they did suggest that amendments that require the assessment to be prepared or certified by a suitably qualified practitioner could be beneficial in respect to the quality of the assessments and the reliability of its results.

349. Staff in the Council's Water and Waste Monitoring team have reviewed the rule proposed by Mr Carvell and believe it is appropriate for a permitted activity, that they can monitor compliance with the proposed rule and that it is enforceable, if necessary.

350. I support the new rule (with minor amendments) proposed by Mr Carvell for the discharge of contaminants from closed landfills and recommend changes as shown in *Reply Report Tracked Changes Version of the Plan*.

Waste Transfer Stations

351. Far North and Whangarei District Councils are seeking an amendment to the definition of 'waste transfer station'. Mr Carvell explains (in paragraph 170 of his evidence) that they seek to replace the term 'municipal solid waste' with 'refuse' because 'refuse' is defined in the Proposed Regional Plan whereas 'municipal solid waste' is not defined.

352. I support the amendment put forward by Mr Carvell as it makes the definition clearer. I recommend that this amendment is adopted by the Hearing Panel.

353. Upon reflection, I believe amendments are required to C.6.7.6 (Waste transfer stations – controlled activity) over and above the changes recommended in the 42A Report. Rule C.6.7.6 includes a condition requiring waste transfer stations to avoid offensive or objectionable discharges to air. I believe these effects would be better addressed through consent conditions. For that reason, I have recommended that the condition on discharges to air is deleted and that a matter of control addressing these matters is inserted into the rule.

Onsite refuse disposal

354. Whangarei District Council and Far North District Council request amendments to rule C.6.7.3 (onsite refuse disposal) that would restrict the permitted activity to properties that are greater than 20ha and more than 20km from a waste transfer station.

355. The 20ha limit is drawn from the Proposed Greater Wellington Natural Resources Plan. Limiting the onsite disposal rule to properties over 20ha is, in my view, a very conservative approach. I have read the officer's reports that support the Proposed Greater Wellington Natural Resources Plan. There does not appear to be a strong basis for the 20ha limit. A more appropriate limit for Northland may be 4ha. This would allow for onsite waste disposal for most lifestyle blocks, orchards and farms but would exclude residential and rural residential properties.

356. I support the inclusion of a 4ha limit within rule C.6.7.3. Introducing a minimum lot size to this rule will be beneficial in managing the risk of cumulative effects of this activity on water quality.

357. In their original submission Whangarei District Council and Far North District Council opposed rule C.6.7.3. Whangarei District Council stated;

The district councils provide for waste disposal facilities which render this rule unnecessary.[96]

358. Federated Farmers of New Zealand took a contrary position. In their opinion district council waste collection is not yet sufficient in rural areas to rely solely on municipal waste collection and recycling. Consequently, there is a need for onsite refuse disposal[97].

359. While I disagree with the district councils' initial position,[98] I accept the moderated position put forward by Mr Carvell[99]. In my mind, this moderated position is reasonable in that it encourages the use of municipal waste facilities where they are available and allows for onsite disposal where they are not.

360. I recommend the panel adopt the relief sought by Mr Carvell with amendments as shown in *Reply Report Tracked Changes Version of the Plan*.

361. One such amendment is that the rule should specify that the property must be more than 20km by road from a transfer station. The intent of the rule seems to be to require waste disposal at transfer stations where they are reasonably accessible. I believe a distance by road is a better measure to achieve this intent than an 'as the crow flies' distance. Due to topography, the by road distance can be much greater than the 20km if an 'as the crow flies' measurement is specified. Staff have produced a map showing these scenarios to assist the Hearing Panel in making decisions on this matter. It can be viewed by following this link.

362. An additional matter to consider is whether the condition should apply to all transfer stations or just those that accept bulk waste. Some waste transfer stations only accept recycling and household waste. These waste transfer stations may not meet the needs of farmers. For that reason, I recommend that the rule specifies that the 20km distance applies to waste transfer stations that accept "bulk rubbish".

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[96] Original Submission by Whangarei District Council, page 25.
[97] Original Submission by Federated Farmers of New Zealand. Page 22
[98] Northland Regional Council, July 2018. *Solid Waste - Recommendations in response to submissions on the Proposed Regional Plan for Northland - Section 42A hearing report. Para 27.*

[99] Far North District Council and Whangarei District Council. Carvell, para 166.

Composting of dead animals

363. New Zealand Pork provided evidence[100] on composting dead animals. They seek amendments to make composting of dead animals a permitted activity. Based on the evidence provided, I accept that a permitted activity is appropriate and recommend amendments to the definition of “compost” and rule C.6.3.3.

Stormwater discharges

Author: Ben Tait

Hearing plan requests

364. None

Response to other matters and recommended changes

Definition of a high risk industrial or trade premises

365. Gerard Willis, for Fonterra Co-operative Group Ltd., stated in his evidence:

> *Fonterra submission seeks clarification that the definition of "high risk industrial or trade premise" specifically exclude premises where chemicals may be stored in bulk for the purpose of on-site use.*
>
> *...*
>
> *Fonterra's position is that stormwater discharges from its manufacturing sites should be either permitted or (at most) subject to a controlled rather than discretionary consent. That is generally consistent with rules contained in other regional plans (which generally provide for stormwater discharges as permitted activities subject to meeting appropriate performance/risk management standards). That position is held on the basis that:*
>
> *(a) Hazardous risks are already adequately managed under the Hazardous Substances and New Organisms Act (HSNO) requirements; and*
>
> *(b) There are already on-site measures in place, particularly stormwater interceptors to collect any potentially contaminated stormwater and divert that water to treatment.*

[100] New Zealand Pork. Andrew Hodgson.

...I propose that the definition of high risk industrial or trade premises be amended as follows (note this is similar to, but more discretely focused than the option included in Fonterra's submission):

An industrial or trade premises used for any of the following purposes and which stores, uses or generates hazardous substances at the site ~~which~~that are exposed to rain ~~or~~ and can be entrained in stormwater:

...

4) chemical manufacture, formulation or bulk storage, recovery, processing or recycling, but excluding bulk storage of chemicals for on-site use by manufacturing processes not listed in 1) to 9);

366. I agree with Mr Willis' logic and recommendation and consider that the definition in the plan be amended as such.

367. David Le Marquand, for the Oil Companies, stated in his evidence that he recommended amending "the definition of High Risk Industrial or Trade Premises to exclude only those MfE Guideline compliant service stations, which is effectively the approach taken in the Auckland Unitary Plan in terms of the identification of such sites not complying with the Guideline being considered high risk industrial and trade premises that therefore requiring consent."[101]

368. The Oil Companies also sought changes to condition 3(c) of Rule C.6.4.2, being the inclusion of a reference to the Ministry for the Environment's Guidelines for Water Discharges from Petroleum Industry Sites in New Zealand. I also support this recommendation.

369. Mr Le Marquand provides sound evidence in support of the amendment. I consider that the changes should be made to the definition.

Rule C.6.4.2 (Other stormwater discharges)

370. Haigh Workman Ltd requested that Condition 2 of Rule C.6.4.2 (as notified) be amended to specify flood mitigation standards. John F. Papesch, for Haigh Workman

[101] Statement of Evidence of David Le Marquand for Z Energy Ltd, Mobil Oil NZ Ltd, BP Oil NZ Ltd (The Oil Companies). 10 August 2018. Paragraph 4.17, page 11.

Ltd, usefully and clearly explains why in his evidence.[102] I agree with the evidence and recommend that their relief is adopted.

Tangata whenua provisions

Author: Keir Volkerling

Hearing panel requests

Policy D.1.3 - still unclear about use of term "TW community" and "TW". "TW" can be used singularly or plurally – the marae does not constitute "TW" if using RMA definition. Why is there a need to distinguish b/w TW community and "TW"? Please provide further thinking on this.

371. My intention when using the word "community" was to clarify that assessment was relevant to a collective and not an individual or small group of individuals. Since the RMA definition of tangata whenua is "*in relation to a particular area, means the iwi, or hapu, that holds mana whenua over that area*" tangata whenua necessarily involves a collective. I therefore support the deletion of "community" from Policies D.1.2 and D.1.3.

Provide panel wording for potential footnote for term "tangata whenua" which includes reference to the RMA definition

372. Proposed footnote:

> *The RMA definition of tangata whenua is "in relation to a particular area, means the iwi, or hapu, that holds mana whenua over that area". For an analysis of effects the appropriate iwi or hapū will need to be identified. Council officers will be available to assist with this.*

Response to other matters and recommended changes

373. I found errors in both the introductory karakia and the mihi. I made corrections which I provided to the author, Abraham Witana, who has agreed to the changes.

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[102] John Francis Papesch. Evidence in Support of Submission 2017 PRP 407 by Haigh Workman. 8 August 2018. From paragraph 15.

The corrected karakia is:

He karakia ki nga Atua	**A prayer to Māori gods**
Ko Rangi	There's Rangi
Ko Papa	There's Papa
Ka puta	The births
Ko Rongo	Of Rongo
Ko Tane Mahuta	Of Tane Mahuta
Ko Tangaroa	Of Tangaroa
Ko Tumatauenga	Of Tumatauenga
Ko Haumietikitiki	Of Haumietikiki
Ko Tawhirimatea	Of Tawhirimatea
Ko Ruamoko	Of Ruamoko
Tokona Te Rangi ki runga	Separate the Sky above
Te Papa ki raro	The Land below
Ka puta Te Ira Tangata	The human element is born
ki Te Whai Ao	Into the physical world
Ki Te Ao Marama	Into the world of light
E rongo whakairia ake ki runga	Let peace elevate back up above
Tuturu whakamaua Kia Tina! Tina!	Bind us together
Haumie hui e!	
Taiki e!	Let it be so!

In the mihi replace the fifth paragraph with the following which incudes “he hau”:

> *Ko te mahere a-rohe mo Te Tai Tokerau (te Mahere) i whakaputaina e te Kaunihera a rohe o Te Taitokerau i runga i te Ture Whakahaere Rauemi 1991 (te RMA). He pokapū a-rohe, he hau, he whenua, he wai, he mahere takutai, me nga ture me nga kaupapa here anake hei arahi i nga tukanga whakaaetanga rauemi*

374. I propose the definition of mātauranga Māori be amended:

> *The knowledge, comprehension or understanding of everything visible or invisible that exists across the universe.*
>
> *Note: ~~This meaning is related to~~ In a ~~the~~ modern context it can include ~~as~~ Māori research, science and technology principles and practices.*

375. The second sentence implies that in the modern context mātauranga is restricted to research, science and technology principles and practices, and has no intrinsic independent value within other facets of Māori society.

Proposed changes to the tangata whenua policies

376. I have recommended various minor changes to D.1.2 to improve the wording which have no material effect on the meanings.

377. I have recommended the deletion of clause 3)c)iii) of policy D.1.5:

> *~~iii) respect for authority, such as rangatiratanga, and respect for relationships, such as tuakanatanga, or~~*

378. The clause is conceptual and not place related. This is in contrast with other elements of Policy D.1.5:

- With respect to 3)c)i) - The cultural connection to a place is not only determined through tangata whenua status, but through whanaungatanga. For instance a historic Northland hapū such as Ngare Raumati is the basis for many whakapapa and whanaungatanga links in many parts of the eastern seaboard, but the hapū does not have functional engagement in current issues. The demonstration of whanaungatatanga could be critical in determining the relevant engagement of such hapū.

- With respect to 3)d i): The progeny of Ranginui and Papatuanukūanuku are the personification of natural and physical resources. For instance, in Taitokerau, the domain of Tumatauenga is the foreshore. The role of such atua in different locations and for different natural resources can have significant spiritual associations with place.

- With respect to 3)d)ii): In the evidence of Patuharakeke for their marine site of signficance they identify sites of baptisms and of wāhi tapu with spiritual relevance. In this case they have linked the spiritual values to place. A change to d ii) could be "the recognition of places with connection to the wairua of those with us and those who have passed away.

*Response to submission of Paul White (Sweetwater Farms**)***

379. The submitter was concerned about the ongoing viability of their operations while future consenting for water take irrigation is uncertain.

380. The RPS identifies development of Maori land as an issue (2.5(c)), and says "current use of Maori Land may not provide for the sustainable social, cultural, economic and environmental wellbeing of tangata whenua".

381. The aquaculture policies in the PRP recognise the importance of aquaculture for Maori. D.5.1:

> *"Recognise the significant benefits aquaculture can provide to local communities, Maori and the region including … social, cultural and economic benefits, including local employment and enhancing Maori development (for example by involvement in the aquaculture industry), particularly in areas of Northland where alternative opportunities are limited".*

382. In his submission Paul White identified the potential of agriculture and horticulture to provide economic and employment opportunities for Maori in an area with few alternative opportunities.

383. A similar provision for Maori development in general could by amending D.2.2 as follow:

> *D.2.2 Social, cultural and economic benefits of activities*
>
> *When considering resource consents, regard must be had to social, cultural and economic benefits of the proposed activity, recognising significant benefits to local communities, Maori and the region including local employment and enhancing Maori development particularly in areas of Northland where alternative opportunities are limited.*

Wastewater discharges

Author: Ben Tait

Hearing panel requests

New horticulture wastewater rule – why include it (doesn't appear to be addressed in S42A report)?

384. I briefly discussed and made recommendations in the RMA s42A evaluation report (titled "Wastewater discharges") on including a new permitted activity rule (C.6.3.1A) in the Proposed Plan for discharges of horticulture wastewater to land.[103] I also recommended amending rule C.6.3.5 so that it applies to discharges of horticulture wastewater to land that are not permitted by rule C.6.3.1A.[104]

385. I stated in the evaluation report: "I consider that the recommended changes to rule C.6.3.1 (listed above) and the introduction of a new permitted activity rule for discharging horticulture wastewater discharges [sic] to land will reduce the [sic] compliance costs but not at the expense of the environment."[105] I did not expressly evaluate the effect of my recommended changes to rule C.6.3.5 as it relates to people

[103] Tait, B. 2018. Wastewater discharges. Recommendations in response to submissions on the Proposed Regional Plan for Northland – Section 42A hearing report. Northland Regional Council. paragraphs 138 – 142, pages 31-32.
[104] Ibid
[105] Ibid, paragraph 143, page 32.

discharging horticultural wastewater discharges to land in a way that is not permitted by rule C.6.3.1A.

Response to other matters and recommended changes

Policy direction on applications for resource consents to discharge wastewater to land and water

386. DairyNZ and Fonterra requested stronger and more specific policy direction in the Proposed Plan on farm wastewater discharges. Richard Allen, for Fonterra, stated:[106]

> *The Section 42A report (Wastewater Discharges) at 130 recognises that better policy direction is required on preferring discharges to land over discharges to water (Policy D.4.7). While we agree with the report that the DairyNZ wording gives improved direction we are still concerned that the suggested new policy wording would only require consideration of "economic" and "practicable" viability. In our view this still may not require any assessment of the likely effects on the options available on water quality options.*
>
> *Mr Willis in his evidence (re Policy D.4.7) has suggested separating out a manufacturing wastewater discharge policy from a farm wastewater policy and adding an additional more general policy on freshwater quality. If this approach was adopted there would be more balanced policy direction for council officers considering farm wastewater discharge applications, consistent with the effective management of a higher risk activity. It is the Fonterra position that council officers considering an application to discharge under rule C.6.3.6 should be directed to a Farm Wastewater Policy and to a general Maintaining Freshwater Quality Policy as described by Mr Willis.*

387. Gerard Willis, for Fonterra, stated in his evidence:

> *Fonterra's submission on Policy D.4.7 is that the policy should focus on farm wastewater discharges and industrial (and municipal) wastewater discharges should be dealt with separately under a dedicated policy regime similar to that commonly found in other regional plans. As notified, Policy D.4.7 appears to address all types/sources of wastewater.*
> *...*
> *On that basis my suggestion for an industrial wastewater discharge policy (in addition to the rural wastewater water policy discussed separately by Mr Allen) is as follows:*
>
> ***Industrial wastewater discharges***

[106] Richard Allen for Fonterra: Hearing Statement. 13 August 2018. paragraphs 7.2 - 7.3, pages 6-7.

An application to discharge industrial wastewater to water will generally not be granted unless:

(a) the best practicable option to manage the treatment and discharge of contaminants is adopted.

388. I support the suggestion by Gerard Willis and recommend that Policy D.4.7 is separated into two policies – that is, a policy on industrial and trade wastewater discharges (and domestic and municipal wastewater discharges) and a policy on primary production discharges.

389. Regarding the latter, I recommend a new policy is included in the Proposed Plan that provides direction on how an application for a resource consent to discharge agricultural or horticultural wastewater to water should be considered. The recommended policy is set out in *Reply Report Tracked Changes Version of the Plan*.

Rule C.6.1.2 (Pit toilet discharges)

390. Rowan Tautari submitted that the minimum distance (10m) that pit toilets must be set-back from water and property boundaries should be increased.[107] After giving the issue more thought, I consider that the setback distances should be increased from 10 metres to 20 metres in relation to rivers, lakes, streams, natural wetlands and the coastal marine area.

Rule C.6.1.3 (Other on-site treated domestic wastewater discharges)

391. Francis Papesh stated in his evidence, on behalf of Haigh Workman Ltd:

If designed and constructed in accordance with AS/NZS 1547, trenches and beds are acceptable options for wastewater disposal with less risk of water contamination than the surface irrigation method permitted in the rule. It is conservative to apply the surface irrigation set-backs to trenches and beds. Rather than requiring resource consents for trenches and beds, we ask that they be provided for in the permitted activity rule with the same set-backs as for surface irrigation.

Our submission proposed a simple method of including trenches and beds in the permitted activity rule: Add to the start of Clause (5): 'the discharge of primary or secondary treated

[107] Rowan Tautari. Northland Regional Plan Submission. 17 November 2017.Page 16.

wastewater is via a trench or bed designed in accordance with AS/NZS 1547: 2012 Appendix L, or'.

We request that Council provide for these methods of disposal in the permitted activity rule.

392. Having considered the evidence, I recommend that a Condition 5 of Rule C.6.1.3 is amended to provide for the discharge of secondary treated or tertiary treated domestic wastewater to land via a trench or bed designed in accordance with AS/NZS 1547:2012 Appendix L.

393. However, after discussions with Stuart Savill (Consents Manager, Northland Regional Council), I do not agree with trenches in all soil categories due to risk of groundwater contamination, particularly in category 1 and 2 soils (i.e., sands and gravels).

394. The specified separation distance for secondary/tertiary treated wastewater was based on use of irrigation lines which maximises the areal application of the wastewater and therefore renovation within the underlying soil. Appendix R (Recommended setback distances) of AS/NZS 1547:2012 provides guidance on this risk as well and recommends greater than 0.6 m separation for all but tertiary treated wastewater.

395. Given the very few cases of tertiary treatment being used for domestic wastewater in Northland, it is considered that a separate separation distance for tertiary treated wastewater Is not warranted. It would also be beneficial for the council to check the tertiary system, as use of such a system would signal a greater risk to water quality. The latest draft Auckland Council document for wastewater GD06 (2018), which will replace TP 58, also proposes a separation distance to groundwater for secondary treated wastewater in Category 1 and 2 soils that is significantly greater than 0.6 m, regardless of the disposal system used. On balance, it is staff recommendation that if trenches and beds are to be used for secondary or tertiary treated wastewater then they should only be a permitted activity in Category 3 to 5 soils as the risk to any underlying groundwater quality is sufficiently minimised due to soil structure.

Rule C.6.2.1 (Wastewater discharge from a pump station or pipe network)

396. In the RMA s42A report titled "Wastewater discharges" I recommended that Rule C.6.2.1, which classifies wastewater discharges (i.e., overflows) from a wastewater pump station or pipe network into water or onto land where it may enter water, should

be deleted at the activity by classified as a discretionary activity. My reasons are set out in paragraph 55 of the report, which I have reproduced as follows:[108]

> *I consider that rule C.6.2.1 should be replaced with a discretionary rule for the discharge of wastewater from a public wastewater reticulation network (pipes and pump stations). This would mean that the actual and potential adverse effects of wastewater discharges and other considerations such as costs of upgrading or construction networks be considered on a case-by-case basis. I also consider that the regional council should have the ability to decline an application for a discharge permit if the adverse effects were unable to be appropriately avoided, remedied or mitigated. Deleting rule C.6.4.1 will mean that district councils will not be required to prepare network management plans, however similar requirements may result from resource consenting processes.*

397. Regarding this matter, Ruben Wylie and Jessica Crawford stated in their evidence, on behalf of the Whangarei District Council and Far North District Council:[109]

> *The primary issue raised by Mr. Carvell relates to the recommendation by the S42A reporting officer to delete Rule C.6.2.1 of the PRP, as notified. That rule provided for the overflow from wastewater pump stations as a controlled activity. WDC submitted in support of that rule, with the exception of some changes to the conditions of the rule. The changes sought are explained in Mr. Carvell's evidence and in the submissions lodged by the Councils.*
>
> *The S42A - Wastewater discharge Report provides an analysis on the submissions relating to the discharge of wastewater network overflows. The author recommends deleting Rule C.6.2.1. The effect of this is that the activity of wastewater discharges from wastewater networks becomes a discretionary activity. The S42A report author, Mr. Tait, explains that a discretionary rule would enable the assessment of effects on the environment for such an activity to be considered on a case-by-case basis and also points out that NRC should retain the ability to decline applications for wastewater network overflows.*
>
> *Mr. Carvell points out that wastewater overflows are simply a reality of all wastewater networks. The costs of mitigating the magnitude or frequency of overflows can be significant and it is not realistic to expect that the system are upgraded to prevent overflows altogether.*
>
> *The reasoning that discretionary activity status is a more appropriate for wastewater overflow applications due to the ability to decline the application is therefore somewhat*

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[108] Ben Tait. Wastewater discharges. Recommendations in response to submissions on the Proposed Regional Plan for Northland – Section 42A hearing report. 3 July 2018. Paragraph 55, page 14.

[109] Joint Statement of Ruben Wylie and Jessica Crawford for the Whangarei District Council and the Far North District Council. 15 August 2018. Paragraphs 170 – 173, and 176, pages 30-31.

artificial on the basis that, drawing from from Mr. Carvell's evidence, all wastewater networks overflow and preventing all overflows is not realistic.

...

Given the unavoidable nature of wastewater network overflows, and the broad matters over which control is reserved in Rule C.6.2.1, we do not agree with the reasoning of Mr. Tait that NRC needs to retain the ability to decline resource consent applications for overflows.

398. I agree that dry and wet weather wastewater overflows are a reality of wastewater networks and that the costs of mitigating the magnitude and frequency of (wet weather) overflows can be significant. I also understand that it is not realistic to expect that wastewater networks are designed and operated to prevent (i.e., avoid) wastewater overflows. Indeed, I highlighted these points in the RMA s32 report.

399. However, I argued at paragraph 55 in the RMA s42A report that the council may need the ability to decline an application for a resource consent to discharge untreated or partially treated wastewater from a wastewater reticulation network "if the adverse effects were unable to be appropriately avoided, remedied or mitigated." And I stand by my recommendation to replace Rule C.6.2.1 with a discretionary activity rule.

400. To reiterate, I do not believe that it is realistic to expect that wastewater networks are designed and operated to prevent (i.e., avoid) wastewater overflows. However, it is not fanciful to consider that there may be certain sensitive receiving environments (e.g., sites of recreational, cultural or economic importance to communities) to which untreated or partially treated wastewater should not be discharged. That is, the benefit(s) of preventing the discharge outweigh the costs of doing so.

401. However, if the Hearing Panel considers that wastewater discharges from a pump station or pipe network should be classified as a controlled activity then I recommend that the direction regarding notification under Rule C.6.2.1 ("Resource consent application under this rule are precluded from public notification") be replaced with "Resource consent applications pursuant to this rule may be notified if special circumstances exist."

Rule C.6.3.1 (Farm wastewater discharges to land)

402. The Minister of Conservation requested significantly larger setback distances for the discharge of farm wastewater to land in adjacent to water bodies and the coastal marine area (i.e., 50 metres, not 20 metres).

403. I strongly disagree with the request because it would be a significant change to the way that farm wastewater discharges to water are managed, and there is no justification to move the "goal posts".

404. Whangarei District Council also sought larger setbacks for discharges of farm wastewater to land adjacent to a water body draining to a public water supply intake.

405. Ruben Wylie and Jessica Crawford, for the Whangarei District Council and the Far North District Council, stated in their joint statement of evidence:[110]

> *...we accept that the conditions included in the permitted activity rule are designed to prevent the land application of farm wastewater from significantly impacting on water quality. However, as we pointed out in our evidence relating to on-site disposal, public health issues tend to arise when something goes wrong and the established requirements to protect the environment are not met. In the case of farm wastewater application to land, this could conceivably occur either with the operational management of the farm, or malfunction of irrigation infrastructure. An increased buffer distance between the receiving water way and the application area would mitigate the effects on water supply schemes when something goes wrong with the wastewater disposal operation and would serve the added benefit of potentially reducing the pathogen loading during runoff events (i.e following rainfall).*
>
> *We are therefore of the opinion that Rule 6.3.1 should be amended to address the submissions points of NDHB, WDC and the further submission of FNDC.*

406. Northland District Health Board (NDHB) requested a 50 metre setback from a waterway within the catchment of a registered drinking water supply

407. Having considered the evidence of WDC, FNDC and NDHB, I consider that Rule C.6.3.1 should not allow the discharge of farm wastewater to land or overflow of wastewater within 50 metres of the water body for a distance of 2,000 metres upstream of a public water supply intake servicing more than 25 people.

408. Several submitters requested provision for roof water to be captured and stored in farm wastewater storage facilities (e.g., ponds) provided the facilities are sized to accommodate roof water.[111] Having considered detailed evidence, particularly on the

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[110] Joint Statement of Ruben Wylie and Jessica Crawford for the Whangarei District Council and the Far North District Council. Planning Evidence. 15 August 2018. Paragraphs 161-162, page 29.

[111] For example, Federated Farmers, DairyNZ and Landcorp Farming.

use of the Dairy Effluent Storage Calculator (DESC) by Logan Bowler[112], I agree with the submitters and recommend that provision is made within Condition 4 of Rule C.6.3.1.

409. Similarly, several submitters challenged the requirement to divert stormwater from yards at dairy sheds (Condition 5). Having considered the evidence put forward by Logan Bowler (DairyNZ), I consider that condition 5 should be amended to provide for stormwater to enter wastewater storage facilities provided they are sized to accommodate stormwater.

410. While Fonterra supports the requirement for storage facilities to be designed, constructed and used in accordance with the DESC, it requests a suitable transition period for dairy farmers to adjust to the requirement.[113] I consider that 1 March 2021 is an appropriate deadline (approximately three years from now).

Water quality management

Author: Ben Tait

Hearing panel requests

Can staff consider appropriate provisions for the use of farm plans an alternative pathway to compliance with rules? Provide suggested wording to provide more certainty about which industry-based FEPs qualify by naming specific FEPs/templates.

411. Beef + Lamb New Zealand sought a provision in the Proposed Plan for farm environment plans (FEPs) as an alternative pathway to complying with "inputs or specific management actions."[114]

412. Corina Jordan, for Beef + Lamb New Zealand stated:[115]

[112] Statement of Evidence of Logan Bowler for DairyNZ Ltd. 9 August 2018.
[113] Richard Allen for Fonterra: Hearing Statement. 13 August 2018. Paragraph 7.5, page 7.
[114] Corina Jordan. 29 August 2018. Hearing Summary Statement on Proposed Regional Plan for Northland. Paragraph 13, page 5.
[115] Corina Jordan. 2017. Submission to Northland Regional Council on the Proposed Regional Plan for Northland Beef + Lamb New Zealand Ltd. paragraph 2.7, page 4.

B+LNZ seeks amendments to existing provisions/ and inclusion of new provisions, to provide for farming land based activities undertaken in accordance with an industry LEP/FEP (such as B+LNZ Land and Environment Plan). This route should also provide an alternative gateway to the activity based and more prescriptive input standard type regulatory approaches, such as policies D.4.31, and D.4.32, and rules C.8.1.1, C.8.1.2, C.8.2.1, C.8.2.2, C.8.3.1, C.8.3.2, C.8.4.1, C.8.4.2, C.8.4.3, E.0.1, E.0.6, E.0.7, E.0.8, E.0.9, and E.0.10.

413. The Hearing Panel invited Beef + Lamb NZ to develop wording (preferably in conjunction with Northland Regional Council, Landcorp Farming Ltd and Fonterra) for provisions that provide for an alternative regulatory pathway (compared to existing permitted activity rules) for farms with industry template FEPs.

414. Corina Jordan (Beef + Lamb NZ) provided draft FEP provisions to Richard Allen (Fonterra), Lindsay Fung (Deer Industry New Zealand) and me (Ben Tait)[116].

415. Richard Allen provided, on behalf of Fonterra and following a review by Gerard Willis (independent planning consultant, Enfocus Ltd) a memorandum in response to the Hearing Panel request for comments on how farm environment plans (FEPs) might be incorporated into the Proposed Plan. The response (Appendix 9) explains that:[117]

Fonterra is strongly supportive of the use of tailored FEPs as a method to ensure all dairy farmers are applying good management practices within reasonable transition timeframes...Fonterra is, however, very concerned to avoid the less than robust FEP in to a rule framework. By that [Fonterra] mean[s] a framework where an FEP effectively replaces having <u>any</u> bottom line rules and where a wide discretion in deciding how a high risk activity might be managed is left with the farm planner. While identification and efficient management of farm specific issues does require a tailored response (and therefore some degree of discretion), this response should always be guided by clear bottom lines or reference to agreed good management practices. In my opinion there is a clear risk of a perverse outcome if the introduction of a regulatory FEP undermines an existing industry programme that is more rigorous and seeks more aspirational outcomes.

...

Additionally, we note that the administrative burden on Northland Regional Council (NRC) from a land use consent regime (if that was to be considered) would be significant, and would be a cost passed on to farmers. Given this we wonder if FEPs might better be considered in methods and policies of the pRPN as an approach that might be applied

[116] Corina Jordan. 16 September 2018.
[117] Richard Allen. 26 September 2018. Proposed plan for Northland FEP feedback to Panel. page 1.

through future FMU level rules to more sensitive catchments, where that is found to be appropriate.

416. On Monday, 8 October 2018, I discussed with Beef + Lamb NZ, Fonterra and DairyNZ[118] the matter of farm environment plans as either (a) compulsory tools to assist with minimising contaminant losses to water (in addition to compliance with rules for 'high risk activities, e.g., livestock access to water, earthworks, or (b) as "alternative regulatory pathway" to compliance with rules.

417. I stated that I consider that FEP's should not be a substitute to compliance with rules (i.e., alternative pathway), rather they should be an additional tool to more effectively manage environmental risks. I also stated that Northland Regional Council staff have several issues with making FEPs compulsory at this time, which are:

- The current lack of capacity to deliver FEPs
- Ensuring that there is a consistent approach in developing FEPs (i.e., to minimise discretion in how they are developed and approved)
- Resourcing implementation (particularly for FEPs with a focus on soil conservation)
- Monitoring compliance with FEPs requirements (e.g., will it be industry and/or council led).

418. I also stated that I am not sure if this is the right time to mandate compulsory FEPs. Rather, they should be potentially considered as a regulatory tool as part of the scheduled 2021 plan change to address the freshwater quality management requirements in the NPS-FM.

419. Following the discussion and after considering the submissions, evidence and subsequent information from Beef + Lamb NZ, Fonterra and DairyNZ, I recommend, on balance, that the Proposed Plan should not be amended to provide for FEPs as an alternative pathway to compliance with rules in the plan, or (b) require FEPs in addition to compliance with regional rules for certain activities. I believe that FEPs are likely to

[118] Conference call with Corina Jordan *(Beef + Lamb NZ), Richard Allen (Fonterra), Charlotte Wright (DairyNZ), and Helen Moodie (DairyNZ). Lindsay Fung (New Zealand Deer Farmers Association) and Rob Van Duivenboden (Landcorp Farming Ltd) were also invited to participate but were unable to.

be considered as a potential tool for achieving freshwater quality objectives that will be included in the regional plan by way of a plan change in 2021.

Can staff please provide an indication of the scale of intensive winter grazing in Northland?

420. I understand, following discussions with Northland Regional Council's Land Management department[119], that intensive winter grazing occurs but is not a common practice in Northland.

421. The Government recently stated that "[c]ertain activities such as intensive winter grazing, hill country cropping and feedlots are expected to be regulated under a new Freshwater [National Environmental Standard]."[120]

Response to other matters and recommended changes

Evidence of Kathryn McArthur on behalf of the Minister of Conservation

422. Kathryn McArthur in her statement of evidence on behalf of the Minister of Conservation raises three key issues that need to be addressed:

- Commentary on the state of water quality in Northland rivers
- The appropriateness of the recommended freshwater management units
- The inclusion of "numeric water quality goals"

423. Several other submitters supported and referenced Kathryn McArthur's evidence. I address the issues listed above in turn.

Commentary on the state of water quality in Northland rivers

424. Kathryn McArthur's evidence contains statements relating to water quality in Northland rivers. Kathryn McArthur states that "[l]ittle information is provided about the current state of water quality in the rivers of the Northland Region to support the PRPN

[119] Rod McGregor, Land Management Advisor, pers. comm., 3 October 2018; Michael Mitchell, Land Management Advisor, pers. comm., 3 October 2018; Jenny Gillanders, Land Management Advisor, pers. comm., 4 October 2018.

[120] Ministry for the Environment and Ministry for Primary Industries. 2018. *Essential Freshwater: Health Water, Fairly Allocated.* Wellington: Ministry for the Environment and Ministry for Primary Industries. page 13.

approach."[121] It is not clear what this statement means. Northland Regional Council collects a wide range of data on water quality characteristics (parameters) from more than approximately 63 representative sites in Northland rivers and from 27 high value lakes, and from many aquifers and estuaries. The data is publicly available. Some of the information can be viewed on the LAWA (Land Air Water Aotearoa) website and the council routinely publishes state of the environment reports[122]. It also undertakes and commissions research relating to fresh and coastal water quality. A recent (highly technical) example, which I understand Kathryn McArthur read is Snelder and Kerr 2017.[123]

425. In simple terms, Snelder and Kerr 2017 used statistical cluster analysis to group the 63 river water quality monitoring sites distributed across Northland into 2, 3 and 4 clusters based on water quality data. Three types of statistical model were then used to determine relationships between the cluster-based site classifications and a suite of environmental predictors that represent the characteristics of each site's upstream catchment. These relationships were used to make predictions of the water quality classes for all segments of a digital network representing the region's rivers and produce maps of the alternative classifications. The relationships between the cluster-based site classifications and environmental predictors were used to describe the environmental characteristics of the classes. The models indicated that aspects of catchment geology and catchment topography are strongly associated with water quality variation in the Northland region.

426. The finding that catchment geology and topography are strong drivers of water quality variation in the Northland region is seemingly corroborated by Rissmann et al. 2018[124]. Rissmann et al. 2018 applied physiographic science to the Northland region, which involved using existing geospatial data, multidisciplinary knowledge, and water quality and hydrochemical data to produce a preliminary classification of hydrological and

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[121] Statement of Evidence of Kathryn Jane McArthur on behalf of the Minister of Conservation. paragraph 29, page 8.
[122] For example, https://www.nrc.govt.nz/resource-library-summary/environmental-monitoring/state-of-the-environment-monitoring-12/state-of-the-environment-report-2015/
[123] Snelder, T., Kerr, T. 2017. Options for river water quality management classifications for the Northland region. LWP Client Report 2017-02.
[124] Rissmann, C., Pearson, L., Lindsay, J., Couldrey, M., and Lovett, A. 2018. Application of Physiographic Science to the Northland Region: Preliminary Hydrological and Redox Process-Attribute Layers. Land and Water Science Report 2018/11. p88.

redox process layers[125]. The process layers are considered a current best estimate of the likely key hydrological and redox gradients, that in addition to land use, are thought to govern spatial variation in water quality outcomes in the Northland region. The findings in the report may explain why Northland has elevated levels of *E.coli,* phosphorus and ammoniacal nitrogen in its rivers, relative to other regions, and why nitrate-nitrite-nitrogen are relatively low.

427. Kathryn McArthur then states in her evidence that "[t]he s32 and s42A reports discuss the risk of nuisance periphyton in Northland rivers and rely on the conclusions of unpublished reports analysing periphyton." To be clear, the RMA s32 and s42A reports do not rely on reports that she cites[126].

428. The RMA s32 and s42A reports state that the principle reasons why the council did not include numeric objectives for periphyton, and associated nutrient concentrations and exceedance criteria, in the proposed plan are: (a) the council had insufficient information on periphyton biomass and the relationships between periphyton biomass and environmental drivers, and (b) the effect of the amendments to the NPS-FM in August 2017 (the month before the Proposed Plan was notified. The RMA s32 and s42A reports also highlighted that the relationships between periphyton and environmental drivers (including nutrients are complex). This point is highlighted, for

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[125] The preliminary hydrological process-attribute layer includes mapping:
- Hydrological domain for water source
- Overland flow
- Lateral flow
- Artificial drainage
- Deep drainage

The preliminary redox process-attribute layer includes mapping:
- Soil reduction potential
- Geological reduction potential
- Combined soil and geological reduction potential

[126] Gray, T. 2012; NRC. 2016. Periphyton interim data review. Unpublished technical report

example, in Depree and Walter 2016[127], Kilroy et al. 2017[128], Kilroy et al. 2018[129], MfE 2018[130], and Kilroy and Matheson 2018[131].

429. Regarding the first key reason, the council had insufficient periphyton data in 2017 to grade periphyton monitoring sites, and in turn robustly set numeric periphyton objectives for the region's rivers. The NPS-FM states that the **minimum** record length for grading a site based on periphyton (chl-a) is 3 years of monthly results (i.e., 36 months of periphyton data. It would inappropriate to include numeric periphyton objectives (or "goals") in the plan without having a good understanding of current periphyton biomass levels, as required by the NPS-FM, and an analysis of the relationships between periphyton and environmental drivers. As pointed out by Kilroy and Matheson 2018[132] (Appendix 10):

> *At the beginning of 2018, Northland Regional Council had accumulated three years of monthly data at >30 sites across the region, fulfilling the data collection steps set out in Figure 2 in MfE (2018b). Consequently, there are now sufficient data to begin the process of developing regional relationships between periphyton, flows, nutrients and other environmental variables, as recommended in MfE (2018b).*

430. In other words, it would be inappropriate to set numeric periphyton objectives that could not be met, or conversely set numeric periphyton objectives that provide for a degradation in water quality or that do not reflect community aspirations. (Hence the detailed, prescriptive direction in Policy CA2 of the NPS-FM, and in particular clause (f) of that policy.)

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[127] Depree, C., Walter, K. 2016. Average annual and seasonal accrual periods for Northland streams. Prepared for Northland Regional Council. NIWA Client Report No: HAM2016-020.

[128] Kilroy, C., Wech, J., Kelly, D., Clarke, G. 2017. Analysis of a three-year dataset of periphyton biomass and cover in Canterbury Rivers. Prepared for Environment Canterbury. NIWA Client Report No: 2017085CH.

[129] Kilroy, C., Greenwood, M., Wech, J., Stephens, T., Brown, L., Mathews, A., Patterson, Maree., Patterson, Mike. 2018. Periphyton – environment relationships in the Horizons region. Analysis of a seven-year dataset. Prepared for DairyNZ and Horizons Regional Council. NIWA Client Report No: 2018123CH.

[130] Ministry for the Environment. A draft technical guide to the Periphyton Attribute Note: Under the National Policy Statement for Freshwater Management 2014 (as amended 2017). 2018. Ministry for the Environment: Wellington.

[131] Kilroy, C., Matheson, F. Memo to Ben Tait, Northland Regional Council. October 2018. Review of technical evidence: setting periphyton and nutrient limits for controlling nuisance periphyton.

[132] Kilroy, C., Matheson, F. Memo to Ben Tait, Northland Regional Council. October 2018. Review of technical evidence: setting periphyton and nutrient limits for controlling nuisance periphyton. Paragraph 13.

431. Second, the NPS-FM was amended in the month prior to the notification of the Proposed Plan. Key changes relating to periphyton and nutrient management include:

- New provisions that clarify requirements about regional councils maintaining or improving overall water quality within freshwater management units (the 2014 version of the NPS-FM required overall maintenance or enhancement of water quality within the region, not within freshwater management units.

- A requirement for regional councils to set instream concentrations and exceedance criteria for dissolved inorganic nitrogen (DIN) and dissolved reactive phosphorus (DRP) for the purposes of achieving objectives for periphyton biomass, and where there are nutrient sensitive downstream receiving environments, criteria for nitrogen and phosphorus.

432. Regarding the second amendment summarised above, establishing numeric periphyton objectives is an iterative approach and integrated with setting associated nutrient concentrations and exceedance criteria (i.e., DIN and DRP standards/numeric objectives).

433. Kathryn McArthur goes on to state in her evidence: “In my opinion the data on the state of water quality in Northland does not support the assumptions made in the s32 and s42A reports that periphyton, nutrients or water quality are not issues of concern for the Plan to address.” This statement is incorrect. The RMA s32 and s42A reports do not make or infer assumptions that periphyton, nutrients or water quality are not issues of concern for the Plan to address. Indeed, the Proposed Plan contains a suite of provisions to manage discharges of contaminants to water to maintain and enhance water quality (e.g., stock exclusion rules, farm dairy effluent discharge rules, stormwater discharge rules, and rules for cultivation, earthworks, vegetation clearance and a range of other activities that affect water quality).

434. I’ve clearly explained above why the council decided to delay the establishment of numeric freshwater quality objectives for periphyton and DIN and DRP until 2021 (approximately three years from now). That is, to take the time to analyse the 36 months of periphyton and water quality data collected to date by the council. The analysis and reporting on it robustly will take at least 12 more months. Northland Regional Council has commissioned the work, which is expected to start early 2019.

The appropriateness of the recommended freshwater management units

435. Policy CA1 of the NPS-FM directs every regional council to identify freshwater management units that include all freshwater bodies within its region. A freshwater management unit is defined as "the water body, multiple water bodies or any part of a water body determined by the regional council as the appropriate spatial scale for setting freshwater objectives and limits and for freshwater accounting and management purposes.

436. Because Northland is comprised of approximately 1,700 source-to-sea catchments it is not practicable (or indeed necessary) to treat each individual catchment as a freshwater management unit. During the early development of the Proposed Plan, the council considered that the most appropriate approach for the purposes of establishing default freshwater quality objectives and limits was to group (classify) rivers with similar water quality characteristics due to similar catchment characteristics (e.g., climate, geology, slope, soils). In 2015, Northland Regional Council commissioned LWP Ltd to assist with defining freshwater quality and quantity management units for the region's rivers.

437. Snelder 2015[133] proposed FMUs for Northland rivers that could potentially establish a default regional spatial framework for managing river water quality. The FMU's (lowland and hill) were defined based on a statistical analysis of physiographic drivers of river water quality and quantity. The recommended river water quality FMUs broadly discriminate variation in the water quality characteristics (variables).

438. Snelder 2015 states:[134]

> *An analysis of Northland's 'general' river water quality (i.e. water quality as defined by a mix of physical, chemical, and biological parameters) revealed* ***broad variation*** *associated with variation in catchment topography (Appendix A1). Steep hill catchments are associated with relatively higher water quality than lowland (low gradient) catchments.* ***However, attempts to discriminate finer scaled patterns in the variation in general water quality in Northland were not particularly successful. This is because variation in water quality in the region is complex*** *(see Appendix A1 for details). The individual water quality variables tend to vary independently (i.e. they have low correlation to each other). In addition there is large variation in the strength of the relationships between the individual variables and catchment characteristics such as topography, geology, land cover, and climate. [my emphasis]*

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[133] Snelder, T. 2015. Defining Freshwater Management Units for Northland: A Recommended Approach. LWP Client Report Number: 2015-004.

[134] Ibid, page 17

439. Northland Regional Council did not adopt the river water quality FMUs proposed by Snelder 2015 for several reasons, but mainly because average catchment slope (on which the FMUs are based) does not moderately or strongly control visual clarity, dissolved reactive phosphorus and *E.coli*[135].

440. Snelder 2015 acknowledges this where he states:[136]

> *The relatively poor performance of the water quality models and the independent variation of the individual water quality variables indicates that it will not be possible to produce water quality classifications (based on catchment characteristics) that provide a high level of discrimination of water quality patterns and that also perform highly (i.e. that has low misclassification or that explains a large proportion of the total water quality variation). This supports the use of a very simple two-class subdivision, based on catchment slope, to provide a* ***very broad classification for water quality management****.*

441. In addition, the decision on the slope threshold of 10 degrees to define the boundary between lowland and hill river water quality FMUs was also somewhat arbitrary and subjective.

442. Northland Regional Council considered that there may be advantages, for the purposes of a regional water quality planning framework, if the characteristics of water bodies that are relevant to management were more finely discriminated that the two-class river water quality FMUs. In 2017, the council commissioned LWP Ltd to understand a detailed investigation of alternative river water quality classifications using more data and statistical models to derive and test alternative classifications.

443. Snelder and Kerr 2017[137] provided alternative classifications, including several that discriminate regional water quality variation better than the original water quality management classification recommended by Snelder 2015. Snelder and Kerr 2017 concluded:[138]

> *…We recommend therefore that if any of the statistically defined classifications presented here were to be used, some refinement of the classification may be appropriate. The refinement could be carried out by incorporating 'local knowledge' which is not reflected in the site data and spatial modelling. Care would need to be taken to avoid generating many small-scale classes based on local knowledge as this would undermine the general objective of providing a succinct classification for management purposes.*

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[135] See Appendix A1.5, Snelder 2015.
[136] Ibid
[137] Snelder, T., Kerr, T. 2017. Options for river water quality management classifications for the Northland region. LWP Client Report Number 2017-02.
[138] Ibid, page 33

444. In 2019 the council intends to agree on appropriate river water quality FMUs for Northland for the purposes of setting freshwater quality objectives and limits and for freshwater accounting and management purposes. This will involve considering the findings of Snelder and Kerr 2017 and the consequences of the 2017 amendments to the NPS-FM. In particular, the requirement to set nitrogen and phosphorus criteria (instream concentrations or instream loads) for nutrient sensitive downstream receiving environments (e.g., estuaries). This may mean that the council will need to develop FMUs based on estuarine/harbour catchment boundaries and then subdivide them to reflect water quality/stream classifications for different management purposes (e.g., setting numeric objectives for periphyton in hard-bottomed streams, setting objectives for nitrate and ammonia toxicity in soft-bottomed streams that do not support conspicuous periphyton, etc).

445. In summary, I strongly consider that it is not appropriate to include the two-river water quality FMUs (hill and lowland) recommended by Snelder 2015 in the Proposed Plan.

The inclusion of "numeric water quality goals" in the Proposed Plan

446. Kathryn McArthur, on behalf of the Minister of Conservation, recommended that a suite of 'numeric water quality goals' should be included in the Proposed Plan for outstanding rivers and rivers in the sought lowland and hill river water quality FMUs. I address the recommendations and associated reasoning below.

Numeric periphyton and nutrient goals

447. I consider that the recommended "numeric water quality goals" for periphyton biomass and cover, and associated dissolved inorganic nitrogen (DIN) and dissolved reactive phosphorus (DRP) goals, are not based on empirical analysis and do not reflect the recent work on periphyton by NIWA for Horizons Regional Council[139], Canterbury Regional Council[140] and MfE[141].

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[139] Kilroy, C., Greenwood, M., Wech, J., Stephens, T., Brown, L., Mathews, A., Patterson, Maree,, Patterson, M. March 2018. Periphyton – environment relationships in the Horizons region: Analysis of a seven-year dataset. Prepared for DairyNZ and Horizons Regional Council. NIWA Client Report No: 2018123CH. http://www.horizons.govt.nz/publications-feedback/publications?keyword=periphyton

[140] Kilroy, C., Wech, J., Kelly, D., Clarke, G. 2017. Analysis of a three-year dataset of periphyton biomass and cover in Canterbury Rivers. Prepared for Environment Canterbury. NIWA Client Report No: 2017058CH.

[141] Ministry for the Environment. August 2018. A draft technical guide to the Periphyton Attribute Note: Under the National Policy Statement for Freshwater Management 2014 (as amended 2017).

448. Kate McArthur's states in here evidence:

> *25. The s32 report does identify that there are some areas of Northland with elevated periphyton* ***but relies on conclusions from research in the Manawatū-Whanganui Region to suggest nutrients are not strong causal factors driving the growth of nuisance periphyton (Kilroy 2012) and that more data collection is needed to confirm that this is the case in Northland.*** *The assumption (that nutrients do not contribute to nuisance periphyton growth) is counter to the large body of national and international science on the drivers of periphyton growth (see below), and Northland Regional Council periphyton monitoring data.*
>
> *26. The complexity of factors associated with periphyton growth does not lead to the conclusion that key drivers (flood frequency and nutrient concentrations) can be ignored in the Plan. Flood frequency and nutrients are two drivers of nuisance periphyton growth in rivers affected by elevated nutrients…* ***The desired state for periphyton is inextricably linked to nutrient concentrations and flood frequency****, particularly where concentrations of nutrients are elevated above natural conditions (Suren et al. 2003). [my emphasis]*

449. It is important to note the following in the RMA s32 report, particularly with respect to the reference to Kilroy 2012:

> *However* ***there are some localised issues with periphyton*** *and the council is collecting information to better understand the drivers of elevated periphyton biomass****. Recent research suggests*** *that there are few statistically meaningful relationships between chlorophyll a levels and dissolved reactive phosphorus (DRP) and dissolved inorganic nitrogen (DIN).*[142] *In other words, the research indicates that,* ***on the face of it,*** *nutrients do not appear to be a strong causal factors for periphyton growth at the river water quality monitoring sites in Northland.* ***That said, the council has just less than three years of data and more data and analysis is required before these initial findings can be confirmed (circa. 2018)****.*
>
> *Nationally, research shows that the* ***factors influencing periphyton biomass are multiple and complex****.*[143] *This is also true in Northland where data reveals variation in biomass between sites with similar catchment land uses. Factors include, for example, fine sediment inputs from surrounding land uses (which impact the ability of macroinvertebrates to graze or, where loads are high, create an unstable substrate unsuitable for periphyton to become established), light, temperature, flow regimes (including frequency, magnitude and duration),*[144] *macroinvertebrates, and river substrates.*

450. It is obvious that the RMA s32 report does not rely "on conclusions from research in the Manawatu-Whanganui Region to suggest nutrients are not strong causal factors

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[142] Tanya Gray. 2012. State of the Environment Monitoring of Periphyton at Northland's River Water Quality Monitoring Network Sites 2007-2012. Prepared for Northland Regional Council by TEC Services Ltd.; and Northland Regional Council. Unpublished. Periphyton interim data review: February 2013 – July 2016.

[143] Cathy Kilroy. 2012.Periphyton in the Manawatu Whanganui region: review of three years of monitoring. NIWA Client Report No: CHCH2012-105

[144] Depree C., Walter K., 2016. Average annual and seasonal accrual periods for Northland streams. Prepared for Northland Regional Council. NIWA Client Report No: HAM2016-020.

driving the growth of nuisance periphyton (Kilroy 2012)". It is also my understanding that Kilroy 2012 did not conclude that nutrients are not strong causal factors. In addition, the RMA s32 report did not state that "more data collection is needed to confirm this is the case in Northland."

451. To be clear, it stated that "the council has just less than three years of [periphyton chlorophyll a] data and **more data and analysis is required before these initial findings can be confirmed**" [my emphasis]. The "initial findings" were based on a statistical analysis of limited data (i.e., less than three years of monthly chlorophyll a samples), and were caveated with the statement "on the face of it".

452. Nowhere in the RMA s32 report is the assumption made "that nutrients do not contribute to nuisance periphyton growth". Nor does the report "lead to the conclusion that key drivers (flood frequency and nutrient concentrations) can be ignored in the Plan."

453. In my opinion Kathryn McArthur appears to have misinterpreted the RMA s32 report in paragraph 25 and 26 of her evidence. *

454. That said, I agree with Kathryn McArthur that the "desired state for periphyton [biomass] is inextricably linked to nutrient concentrations and flood frequency". I will return to this statement later in relation to the "numeric annual average DIN and DRP goals to assist in meeting numeric periphyton goals" that she recommends.

455. Kathryn McArthur goes on to state at paragraph 27 in her evidence that

> *The exact nutrient concentration to ensure that nuisance periphyton growth does not affect ecosystem health or recreational values for a given river is not known. However, the body of the research on the subject (Dodds et al. 1998; MfE 2000; Biggs 2000; Dodds et all. 2002; Suren et al. 2003; Biggs 2009; Matheson et al. 2012; Snelder et al. 2013; Matheson et al. 2016), including for rivers in Northland (Snelder 2015; Dupree and Walter 2016) provides good guidance, consistent with the best available scientific knowledge, to set relevant numeric periphyton and nutrient goals in the Plan to manage the risk, severity and duration of nuisance blooms and their effects on freshwater values.*

456. I will briefly summarise the key findings in the scientific papers that Kathryn McArthur states provide "good guidance…to set relevant numeric periphyton and nutrient goals in the Plan to manage the risk, severity and duration of nuisance blooms and their effects on freshwater values." That is because the papers were not made available at or prior to the Hearing and their relevance was not described in Kathryn McArthur's evidence.

* Note - This paragraph was amended 22 November 2018.

457. As an aside, I note that “numeric periphyton and nutrient goals” do not, on their own, “manage the risk, severity and duration of nuisance blooms and their effects on freshwater values”. Management requires controls on point source and diffuse discharges, including limits on nutrient inputs or losses.

458. Dodds et al. 1998[145] derived suggested trophic classification boundaries (oligotrophic-mesotrophic and mesotrophioc-eutrophic) in terms of mean benthic chlorophyll a (mg chl-a/m^2), maximum chlorophyll a (mg chl-a/m^2), sestonic chlorophyll a (ug/L), total nitrogen (ug/L) and total phosphorus (ug/L) from data collected from streams or sites in North America and New Zealand and some European streams. The maximum chl-a, TN and TP concentrations for both trophic states are shown in the following table. It is not clear how they relate to the ‘numeric goals’ for periphyton, DIN and DRP that Kathryn McArthur recommends based on her “experience”[146].

Variable	Oligotrophic-mesotrophic boundary	Mesotrophic-eutrophic boundary
Maximum benthic chlorophyll (mg/m^2)	60	200
TN	700	1500
TP	25	75

459. Barry Biggs (Biggs 2000[147]) derived mean annual DIN and DRP concentration criteria related to average days of accrual for 50, 120 (filamentous) and 200 mg/m^2 (diatom) annual maximum biomass. The derivation method was a multivariate linear regression based on 16-month dataset for 30 New Zealand hill country streams and rivers flowing from hill-country watersheds where snowmelt affected flow regimes, and which incorporated days of accrual following a fresh of three times the median flow. None of the sites were affected by point-source pollution discharges or significant shading from riparian shading from riparian vegetation.

460. While the nutrient criteria in Biggs 2000 account for major drivers of periphyton biomass (nutrients and flow) the criteria do not align exactly with what is required for the NPS-FM periphyton attribute and there is a relatively limited range of DIN

[145] Dodds, W.K., Jones, J.R., Welch, E.B. 1998. Suggested classification of stream trophic state: Distributions of temperate stream types by chlorophyll, total nitrogen and phosphorus. Water Resources. Vol. 32. No. 5. pp. 1455-1462.
[146] McArthur 2018, paragraph 98 and Table 7.
[147] Biggs, BJF. 2000. Eutrophication of streams and rivers: dissolved nutrient chlorophyll relationships for benthic algae. Journal of the North American Benthological Society 19, 17 – 31.

concentrations in the dataset. The method is Biggs 2000 is suitable for regional limit setting but testing on regional datasets has shown that better multivariate models can be developed. I understand that the periphyton, DIN, DRP and accrual period model in Biggs 2000 underpinned the maximum biomass and nutrient criteria in the *New Zealand Periphyton Guideline: Detecting, monitoring and managing enrichment in streams*[148]. Biggs model was not validated.

461. Dodds et al. 2002[149] used several data sets to determine how water column nutrients and non-nutrient factors are linked to periphytic biomass and if the ecoregion concept is applicable to nutrient-periphyton relationships. Dodds et al. 2002 found, among other things, that their best regressions using TN and TP to estimate benthic chlorophyll had R^2 values of 40% and the exact coefficients depend on the data being considered.

462. Suren et al. 2003[150] examined the effect of low flows on periphyton community dynamics in two Canterbury rivers of contrasting enrichment. They found that the degree of enrichment should be taken into account when assessing in-river flow requirements. They suggested that enriched rivers will be more sensitive to flow abstraction, and so may require higher minimum flows to maintain river health, than unenriched rivers. It is not clear to me how the findings of Suren et al. 2003 informed the 'numeric periphyton and nutrient goals' that Kathryn McArthur recommends for inclusion in the Proposed Plan.

463. Biggs 2009 sets out his evidence, commissioned by Manawatu-Wanganui (Horizons) Regional Council, on:[151]

> *…(i) the overall approach of the Proposed One Plan for identifying values, defining water quality standards and management of nutrient enrichment; (ii) the current state of water quality in the Manawatu-Wanganui Region, as indicated by nitrogen and phosphorus concentrations; (iii) the importance of setting water quality standards, with an emphasis on nitrogen, phosphorus and periphyton standards; (iv) the likely environmental outcomes of implementation of the FARM strategy for managing non-point source nutrient enrichment; (v) the adequacy of the methods proposed in the technical report entitled A Framework for*

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[148] Ministry for the Environment. 2000. New Zealand Periphyton Guideline: Detecting, monitoring and managing enrichment of streams. Prepared for the Ministry for the Environment. NIWA, Christchurch.

[149] Dodds, W.K., Smith, V.H., Lohman, K. 2002. Nitrogen and phosphorus relationships to benthic algal biomass in temperate streams. Can. J. Aquat. Sci. 59: 865-874 (2002)

[150] Suren, A.M., Biggs, B.J.F., Kilroy, C., Bergey, L. 2003. Benthic community dynamics during summer low-flows in two rivers of contrasting enrichment 1. Periphyton. New Zealand Journal of Marine and Freshwater Research, 37:1, 53-70.

[151] Section 42A report of Dr Barry Hohn Franklyn Biggs on behalf of Horizons Regional Council. In the matter of hearings on submissions concerning the Proposed One Plan notified by the Manwatu-Wanganui Regional Council. 2009

Managing Non-point Source and Point Source Nutrient Contributions to Water Quality (Roygard & McArthur, 2008); (vi) whether discharges from hydroelectricity dams should be subject to water quality standards; (vii) consideration of the recommendations in the Council Officer's report to the Hearing Panel of Kate McArthur relating to nutrient standards.

464. I assume that Kathryn McArthur's reference to Biggs 2009 was related to the matters (i) – (iii) of his evidence. I will attempt to deduce, what I think, are some of the key findings in the evidence of Biggs that may relate to the setting of "relevant numeric periphyton and nutrient goals in the Plan to manage the risk of severity and duration of nuisance blooms and their effects on freshwater values."[152]

465. First, Biggs 2009 states:[153]

One of the most important messages to convey in this portion of the evidence is that periphyton-nutrient relationships cannot be viewed independently of river flow regimes. In the agricultural landscapes that dominate Horizons' region (and which are of primary concern for the POP), periphyton biomass is jointly controlled by flow conditions (particularly the magnitude and frequency of floods) and nutrient availability (particularly dissolved inorganic nitrogen and phosphorus).

466. It is not clear if Kathryn McArthur examined river flow regimes in Northland when recommending the 'numeric periphyton and nutrient goals' for Northland rivers. On the face of it, she did not account for flow regimes (i.e., accrual periods) in Northland rivers.

467. Biggs 2009 goes on to state that "[m]aximum periphyton biomass can be predicted from statistical models that relate dissolved inorganic nitrogen and phosphorus concentrations, and accrual periods, to biomass."[154] This is consistent with recent MfE guidance[155] on establishing DIN and DRP concentrations and exceedance criteria for the purposes of meeting periphyton objectives and the advice of Cathy Kilroy and Fleur Matheson in their review of Kathryn McArthur's evidence (see Appendix 10). Again, it is not clear if Kathryn McArthur followed this approach when developing her recommended 'numeric periphyton and nutrient goals' based on "experience".

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[152] Statement of Evidence of Kathryn Jane McArthur on behalf of the Minister of Conservation. paragraph 27, page 8.
[153] Biggs 2009. paragraph 6, page 2.
[154] Biggs 2009. paragraph 10, page 3
[155] Ministry for the Environment. A draft technical guide to the Periphyton Attribute Note: Under the National Policy Statement for Freshwater Management 2014 (as amended 2017). 2018. Ministry for the Environment: Wellington.

468. Matheson et al. 2012[156] derived mean annual DIN and DRP criteria for low, moderate and high-risk categories for exceeding annual filamentous maximum cover of 30%. The derivation method was a multivariate linear regression with National River Water Quality Network data and a Bayesian Network informed by literature review and the regression analysis. Matheson et al. 2000 also incorporated the following parameters: annual frequency of fresh flows (3 times the median flow), water temperature, light at bed, macroinvertebrate grazer density, substrate type. The regression model with dissolved nutrients explained 43% of the variance. While Matheson et al. 2000 incorporated other drivers of periphyton biomass, the models developed were only for periphyton cover and aesthetic value which is not aligned with the NPS-FM periphyton attribute. It is important to note that Matheson et al. 2000 is not suitable for regional limit setting. That is, it is only suitable as a general guide and initial screening tool for identification of potential periphyton problems or non-problems at sites with periphyton cover data.

469. Snelder. et al. 2013[157] documents background information relating to periphyton in the context of the National Objectives Framework (NOF) and the conclusions reached by the NOF Periphyton Panel of freshwater ecologists (including experts in periphyton) to assist in defining a measurement attribute, thresholds and exceedance frequencies appropriate for periphyton in the context of the NOF. The report also justifies why the use of chlorophyll a is more appropriate as a measure of periphyton abundance rather than periphyton cover.

470. It is not immediately clear how Snelder et al. 2013 provides "good guidance…to set numeric periphyton and nutrient goals in the Plan to manage the risk, severity and duration of nuisance blooms and their effects on freshwater values."[158]

471. It is useful to note that Figure 4-1 in Snelder et al. 2013 shows that most of Northland's rivers have fine substrates (i.e., soft-bottoms), which will not support conspicuous

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[156] Matheson, F., Quinn, J., Hickey, C. 2012. Review of the New Zealand instream plant and nutrient guidelines and development of an extended decision-making framework: Phases 1 and 2 final report. Prepared for the Ministry of Science & Innovation Envirolink Fund. NIWA Client Report No: HAM2012-081.

[157] Snelder, T., Biggs, B., Kilroy, C., Booker, D. 2013. National Objective Framework for periphyton. Prepared for Ministry for the Environment. NIWA Client Report No: CHC2013-122.

[158] Statement of Evidence of Kathryn Jane McArthur. On behalf of the Minister of Conservation. 10 August 2018. Paragraph 27, page 8.

amounts of periphyton. Ministry for the Environment's draft technical guide to the periphyton attribute note states:[159]

> *The NPS-FM periphyton attribute was developed using scientific information **derived exclusively** from hard-bottom streams and rivers. These are streams and rivers that currently have mainly boulder, cobble or gravel substrates (see box below). Step (a)(i) applies to hard-bottom streams and rivers. Section 3.1.1 discusses the various methods for deriving nutrient criteria for hard-bottomed streams and rivers.*
>
> *Soft-bottom rivers are those with mainly sand, silt or clay substrates. These rivers can sometimes support conspicuous growths of periphyton; for example, on sand or silt deposits following long periods of stable river flow, or adhering to macrophytes or other instream debris. Step (a)(ii) applies to soft-bottom streams and rivers. However, the ecosystem health effects of such periphyton growths are less well studied and understood and are not addressed in this document.*
>
> *In their protocols for sampling macroinvertebrates in wadeable streams, Stark et al. (2001) define a hard-bottom river as one where the river bed is dominated by particles of gravel size or greater (ie, <50% of the bed is made up of sand/silt). The New Zealand in-stream Sediment Assessment Methods also use this definition (Clapcott et al., 2011)* [my emphasis]

472. Kathryn McArthur also cites Snelder 2015[160] as a source of "good guidance" for setting "relevant numeric periphyton and nutrient goals in the Plan". Snelder 2015 proposes freshwater management units (FMUs) for the Northland region that would establish a default spatial framework for managing river water quality and quantity in the new regional plan (Proposed Regional Plan for Northland). Northland Regional Council largely adopted the recommended river water quantity FMUs but decided to not adopt the recommended river water quality FMU's for reasons I touched on previously.

473. Snelder 2015 sets out "potential water quality objectives"[161], which should not be construed as recommended objectives for Northland Regional Council to include in the Proposed Plan. Rather, they should be construed as examples. Indeed, Snelder 2015 states "[s]electing objectives is ultimately a political decision and therefore the objectives in this report should be regarded as examples."

474. This point should be noted given the statement by Kathryn McArthur that "Snelder also **suggests** 'default' freshwater objectives" [my emphasis]. Snelder 2015 states:

> *Attribute states for E.coli, NH4N and NO3N are based on median and 95th percentile concentrations (see Table 1). Objectives for periphyton are expressed in term of biomass measured as Chlorophyll a per square metre of river bed. **This analysis used nutrient***

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[159] Ministry for the Environment. August 2018. A daft technical guide to the Periphyton Attribute Note. Under the National Policy Statement for Freshwater Management 2014 (as amended 2017). Page 11.
[160] Snelder, T. 2015. Defining Freshwater Management Units for Northland: A Recommended Approach. LWP Client Report Number: 2015-004
[161] Section 3.2, page 19 of 61

concentration guideline values (nitrate plus nitrite nitrogen (NNN) and dissolved reactive phosphorus (DRP) *that have been used in past Northland State of Environment reports (Ballinger et al., 2014) and which were* ***sourced from ANZECC (2000)****.* ***These are broadly consistent with nutrient criteria to prevent nuisance periphyton abundance suggested by Matheson et al. (2012) and the concentration criteria used to manage periphyton by the Horizons One Plan.*** *It has been assumed that compliance with these criteria would achieve the NPS-FM C state (i.e. to be above the national bottom line) for the periphyton attribute. In the analysis of state that follows, a site was only assigned to the D band if the site median concentrations of* ***both*** *NNN and DRP were higher than those shown in Table 1.* ***Nutrient concentration criteria for NPS-FM periphyton states A and B are not currently available and the current state with respect to periphyton is not established regionally. Therefore objectives for periphyton that that are associated with the NPS-FM A and B states cannot be defined at this stage.***

[my emphasis, except for the emphasis of the word "both" immediately preceding "NNN and DRP"]

475. ANZECC 2000 contains default trigger values for NNN and filterable reactive phosphorus (also known as DRP) to assess risk of adverse effects due to nutrients. The default trigger values are 444 ug/L (mg/m^3) and 21 ug/L (21 mg/m^3). It is important to note that the default trigger values are not related to periphyton response. In other words, there is no linkage with periphyton abundance or thresholds. The values represent general reference conditions in a small number of mainly South Island lowland rivers (i.e., they are based on limited data). That said, they could be used as a reality check on A band nutrient criteria derived by other methods.

476. Matheson et a. 2016[162] derived a range of DIN and DRP concentration bands for different level of periphyton biomass (mg/m^2) and percentage cover (PERIWCC %). It is important to note that there are different nutrient concentration criteria for biomass and % cover. Which is markedly different from the recommended 'numeric periphyton and DIN and DRP goals' in tables 2 and 7 of Kate McArthur's evidence. The derivation method in Matheson et al. 2016 was a non-linear quantile regression of NRWQN and regional council data sets. The level of certainty associated with the outputs was not determined and the model was not validated. The strengths of the models were that they fitted the subsidy-stress response observed in the dataset and the percentiles used aligned with the permitted exceedance frequencies in the NPS-FM periphyton attribute. However, the method (models) are perceived by NIWA as too simplistic. The

[162] Matheson, F., Quinn, J.M., Unwin, M. 2016. Instream plant and nutrient guidelines. Review and development of an extended decision-making framework: Phase 3. NIWA Client Report No: HAM2015-064: 118.

method is potentially suitable for regional limit setting with further development and testing of the method.

477. Lastly, Depree and Walter 2016[163] sets out the findings of their study to:

- Investigate seasonal variation in the two key drivers of periphyton, namely accrual period and nutrient concentrations;
- Use accrual period and nutrient concentration data to predict sites with potential nuisance growths of periphyton; and
- Compare the predictions with available periphyton monitoring data.

478. Depree and Walter 2016 reached the following key conclusion with respect to periphyton management in Northland:

> *If nutrient guidelines or standards (i.e., attribute states) for managing periphyton are developed, these preliminary results suggest that a best approach is to use guidelines derived from accrual periods. Average annual accrual periods ranged from 21 to 43 days for the 19 Northland streams analysed. Given this variability (2-fold),* ***it is unlikely that a 'one size fits all' periphyton nutrient guideline will be effective for managing periphyton biomass across the Northland region****.* [my emphasis]

479. It is important to note Cathy Kilroy and Fleur Matheson's technical review of Kathryn McArthur's commentary and recommendations on including numeric periphyton objectives and numeric DIN and DRP objectives/standards in the plan for meeting numeric periphyton objectives (see attached). While they made many comments and conclusions, I draw the reader to the following:[164]

> *McArthur (2018) has suggested numeric goals for DIN and DRP for the management of nuisance periphyton in Northland rivers in two FMU types (Outstanding rivers/Hill country rivers and Lowland rivers) (Table 7). The numeric values are justified on the basis of "experience".*
>
> *The demonstrated complexity of relationships between periphyton biomass and environmental variables means that such experience-based goals are not easily defensible.*
>
> *The recently released "Draft technical guide to the Periphyton Attribute Note" (MfE 2018b) contains a step-by-step process specifically aimed at assisting Regional Councils set "appropriate instream concentrations and exceedance criteria for nitrogen and phosphorus*

[163] Depree, C., Walter, K. 2016. Average annual and seasonal accrual periods for Northland streams. Prepared for Northland Regional Council. NIWA Client Report No: HAM2016-020.

[164] Kilroy, C., Matheson, F. Memo to Ben Tait, Northland Regional Council. October 2018. Review of technical evidence: setting periphyton and nutrient limits for controlling nuisance periphyton. Paragraphs 15 – 19, page 5.

to achieve periphyton objectives, while ensuring the outcomes sought for sensitive downstream environments are also achieved."

The process set out in MfE (2018b) includes "process steps recommended if development of a regional model is considered the best option for deriving robust nutrient criteria".

Northland Regional Council has already initiated model development by collecting appropriate data. We suggest it could be specified in the PRPN that a regional model is being developed to determine robust DIN and DRP limits for the management of nuisance periphyton in Northland.

480. In summary all available research highlights that periphyton management is:

- Complex – managing periphyton simply through limits on DIN and DRP is not likely to be successful;
- Variable – limits on DIN and DRP vary between rivers and years in line with river geomorphology, climate, substrate and local riparian conditions (e.g., temperature, shade);
- Challenging – relationships vary over time and location, making the collection and analysis of high-resolution (monthly at a minimum for three years) and sometimes lengthy (7 years demonstrated promise in Horizons) records is essential to determining reliable periphyton to environment relationships;

481. While I recognise the importance of nutrient availability in potentially causing or mediating nuisance algal growth across Northland, the underlying causes, patterns and associated limits on DIN and DRP are poorly understood. Complex and exhaustive modelling by NIWA for Horizons Regional Council to better implement and respond to periphyton objectives in the One Plan[165], arguably the most advanced internationally, has demonstrated the above bullet points. Moreover, the recent research and national guidance strongly suggests not adopting simplistic region-wide let alone national DRP and DIN concentrations for periphyton outcomes.

482. It is also important to note that Northland Regional Council recently commissioned independent research to determine inter alia:

[165] Kilroy, C., et al. 2018. Periphyton – environment relationships in the Horizons region: Analysis of a seven-year dataset. Prepared for DairyNZ and Horizons Regional Council. NIWA Client Report No: 2018123CH.

- The major drivers of periphyton growth in Northland, including the roles of DIN, DRP and ammoniacal nitrogen;

- Appropriate instream concentration and exceedance criteria for DIN and DRP for Northland's hard-bottomed rivers[166]; and

- The relationships between chlorophyll a and periphyton cover data.[167]

483. In conclusion, I strongly recommend that numeric periphyton and nutrient goals/objectives/standards/guidelines are not included in the Proposed Plan. Instead, numeric periphyton objectives for periphyton and associated DIN and DRP concentrations and exceedance criteria will be included in the plan by way of a plan change in less than three years, as per NRC's progressive implementation programme.

Dissolved oxygen, pH and temperature

484. Kathryn McArthur, on behalf of the Minister of Conservation, recommends the inclusion of 'numeric dissolved oxygen, pH and temperature goals' in the Proposed Plan. Regarding dissolved oxygen, the recommended 'numeric goals' are based on the DO attribute states in Appendix 2 of the NPS-FM. I largely agree with Kathryn McArthur's statement that "[a] lack of knowledge of current DO levels does not preclude the setting of numeric water quality goals for DO to provide for ecosystem health in Northland rivers."[168] However, as mentioned earlier I disagree with the recommended lowland and hill river water quality FMU's that the 'numeric goals' should apply to.

485. I agree that it would be appropriate to include a numeric dissolved oxygen water quality standard/freshwater objective for outstanding rivers using attribute state A in the NPS-FM (because such rivers are mostly surrounded by natural land cover (i.e.,

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[166] It is important to note that the 'numeric periphyton biomass goals' appear to be based on attribute states A, B and C in Appendix 2 of the NPS-FM. The draft technical guide to the Periphyton Attribute Note states: "The NPS-FM periphyton attribute was developed using scientific information derived exclusively from hard-bottom streams and rivers. These are streams and rivers that currently have mainly boulder, cobble or gravel substrates… Soft-bottom rivers are those with mainly sand, silt or clay substrates. These rivers can sometimes support conspicuous growths of periphyton; for example, on sand or silt deposits following long periods of stable river flow, or adhering to macrophytes or other instream debris. …However, the ecosystem health effects of such periphyton growths are less well studied and understood and are not addressed in this document."

[167] Based on research in other regions (e.g. Kilroy, C., et al 2018) the relationships between percentage cover and chlorophyll a are often poor.

[168] Statement of Evidence of Kathryn Jane McArthur. On behalf of the Minister of Conservation. 10 August 2018. Paragraph 73, page 20.

native bush) and provide shade). However, I consider that in the absence of information on current DO conditions in other Northland rivers an interim water quality standard based on attribute state C should be included in the Proposed Plan. That is because it would be inappropriate and premature to include a standard based on A or B without an understanding of whether it is achievable.

486. In summary, I recommend including a dissolved oxygen water quality standard for outstanding rivers based on attribute state A in Appendix 2 of the NPS-FM and a water quality standard for all other rivers based on attribute state C in the NPS-FM. Both should apply below point source discharges. The council is about to start collecting continuous dissolved oxygen data from a representative range of streams and rivers which may lead to a revision of the attribute C state-based standard in the Proposed Plan. My recommendation is consistent with the relief sought by DairyNZ Ltd. Dr Craig Depree stated, on behalf of DairyNZ:[169]

> *The NPS-FM dissolved oxygen (DO) attribute only applies 'downstream of point source discharges' to manage the risk of low DO concentrations caused by the oxygen demand in effluent. Because the DO attribute applies to point source discharges (as opposed to diffuse discharges within a FMU), numeric objectives (or 'standards') for dissolved oxygen could be included in the pNRP without the need for water quality FMUs.*
>
> *At a minimum, the pNRP could have 'standards' that do not permit any point source discharge to cause downstream DO concentrations (after reasonable mixing) that are lower than the national bottom-line (i.e. C/D) threshold 1-day and 7-day average minima values of 4.0 and 5.0 g/m3, respectively. One-day DO minima showed that none of the Northland regional river water quality monitoring sites had dissolved oxygen below the national bottom-value (NRC).*

487. I also consider that, on balance, it may be appropriate to include water quality standards for rivers (that would apply to point source discharges) based on the Proposed NOF bottom line attributes for temperature (in maritime climates) and pH, as they are underpinned by robust science.

Ammonia and nitrate toxicity

488. Kathryn McArthur, on behalf of the Minister of Conservation, also recommends including 'numeric ammonia and nitrate toxicity goals" for rivers in Northland. With nitrate toxicity 'goals' for all rivers based on the A attribute state for nitrate toxicity in Appendix 2 of the NPS-FM and ammonia toxicity 'goals' for outstanding rivers and hill country rivers based on the A attribute state in the NPS-FM. Kathryn McArthur

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[169] Statement of Evidence of Dr Craig Verdun Depree for DairyNZ Limited. 8 August 2018. Paragraphs 42-43, page 15.

recommends the proposed ammonia toxicity standard for "other rivers" (not outstanding rivers) be reinserted in the Proposed Plan but only for rivers in the sought lowland river water quality FMU.

489. I recommend that the proposed ammonia and nitrate toxicity standards are reinserted into an appendix in the Proposed Plan. This is consistent with the Northland Regional Council's programme for progressively implementing the NPS-FM.

Macroinvertebrate Community Index (MCI)

490. Kathryn McArthur states:[170]

> *The Northland RPS objectives identify macroinvertebrate health as an important aspect of water quality in Northland. In order to measure the success of achieving the RPS objective over time, numeric MCI goals are a practical approach being applied in other regional plans in New Zealand. Additionally, amendments to the NPS-FM (2017) require regional councils to monitor macroinvertebrates and if they are less than 80 [sic] or show a declining trend, to establish methods to respond to this issue.*

491. Kathryn McArthur goes on to recommend 'numeric MCI goals' for outstanding rivers, and rivers in the sought hill and lowland river water quality FMUs.

492. I strongly disagree with the recommendation for several reasons. First, MCI is affected by a range of variables, not just water quality. This is pointed out by Clapcott and Goodwin 2014:[171]

> *Sediment and nutrients were identified as probable causal pathways for land use to impact MCI. However, results showed that multiple drivers were associated with variation in MCI and that the drivers were not independent of each other. This intercorrelation between catchment and segment scale, natural and impact variables make the relationships between MCI and specific variables hard to quantify.*
>
> *Overall results suggest that MCI scores are related to land use through a complex chain of causality, which makes isolating the role of specific variables difficult. The impact of limits placed on one effect pathway will depend on interaction with other pathways and will also be influenced by the local habitat. Catchment scale management may not result in response to MCI scores without equal consideration of segment scale management and vice versa.*

493. I understand that it is for these reasons that the MCI has not been included as an attribute in Appendix 2 of the NPS-FM. Instead, it is not a requirement for regional

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[170] McArthur 2018. Paragraph 81, page 22.
[171] Clapcott, J., Goodwin, E. 2014. Relationships between MCI and environmental drivers. Prepared for Ministry for the Environment. Cawthron Report No. 2507.

councils to monitor macroinvertebrate communities using the MCI. Policy CB3 of the NPS-FM states:

> *By every regional council:*
>
> *a) using the Macroinvertebrate Community Index;*
>
> *b) establishing methods under Policy CB2 to respond to a Macroinvertebrate Community Index score below 80, or a declining trend;*
>
> *c) ensuring that methods:*
>
> *i. investigate the causes of declining trends or the Macroinvertebrate Community Index score below 80;*
>
> *ii. seek to halt declining trends; and*
>
> *iii. seek to improve on a Macroinvertebrate Community Index score if it is below 80, unless this is caused by naturally occurring processes, pest or unwanted organism, or by infrastructure listed in Appendix 3.*

494. Notwithstanding the fact that I consider that the MCI is not suitable as a water quality standard (rather, it is suited as an 'integrating' indicator of stream ecological health), Kathryn McArthur did not attempt to quantity or identify, or in any way assess, the impacts of including 'numeric MCI goals' in the Proposed Plan.

495. I recommend that 'numeric MCI goals' (or MCI water quality standards or guidelines) are not included in the Proposed Regional Plan. Again, it is important to reiterate that Northland Regional Council has existing obligations with respect to monitoring and responding to poor or declined MCI scores under the NPS-FM.

496. Lastly, Kathryn McArthur recommended that a "numeric goals for all point source discharges of no more than 20% reduction between upstream and downstream monitoring sites for rivers in Northland."[172]

497. Like the MCI, I understand that the QMCI integrates multiples pressures on freshwater ecosystems and can change for various reasons, e.g., changes to riparian cover, instream habitat, light climate, flows, and water quality. It is not clear to me how a 20% reduction between upstream and downstream monitoring sites would be determined when assessing the effects of a proposed discharge on QMCI. I support QMCI being

[172] McArthur 2018. Paragraph 128, page 35.

used as a monitoring indicator or overall stream ecological health, but to use it as a water quality standard ('numeric goal') would be inappropriate.

Nuisance macrophyte cover

498. Kathryn McArthur recommended the inclusion of 'numeric macrophyte goals' for outstanding rivers and rivers in the sought hill and lowland river water quality FMUs.

499. I disagree with the recommendation. Macrophyte biomass and cover are influenced by several factors including river bed substrates, nutrients, light availability, hydrological disturbance parameters. Although, it well recognised that nuisance periphyton biomass is most common in lowland, soft-bottomed, unshaded and nutrient rich streams and rivers. I understand macrophyte growth is complicated because most macrophytes obtain nutrients from sediment and water. I also understand that the key methods to mitigate nuisance macrophyte biomass in soft-bottomed lowland rivers are the availability of flushing flows and reduced light availability through shading. There are some research findings that reducing DIN below 1000 mg/m^3 may constrain macrophyte growth and biomass[173].

500. I note that Kathryn McArthur did not attempt to identify or assess the impacts of including 'numeric macrophyte cover goals' for rivers in the Proposed Plan.

501. Because the macrophyte cover and biomass are influenced by multiple factors and the relationships between nutrient concentrations and macrophyte growth are complicated, I consider that it is not appropriate to include 'numeric macrophyte goals' for rivers in the Proposed Plan.

Toxicants, metals and metalloids

502. Kathryn McArthur recommended the inclusion of 'numeric species protection goals for toxicants, metals and metalloids' in the form of the trigger values for toxicants at alternative levels of protection in Table 3.4.1 of the Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Volume 1, 2000 (ANZECC). The table lists more than 200 toxicants, including trigger values for ammonia and nitrate which

[173] Ministry for the Environment. August 2018. A draft technical guide to the Periphyton Attribute Note Under the National Policy Statement for Freshwater Management 2014 (as amended 2017).

differ from the 'numeric ammonia and nitrate toxicity goals' that Kathryn McArthur recommends.

503. Kathryn McArthur states in her evidence:[174]

> *...The specific trigger values for each toxicant to provide for the desired levels of species protection are found in Table 3.4.1 of the ANZECC (2000) guidelines. The guidelines are currently being updated and work is also underway to introduce some common heavy metal attributes found in the ANZECC guidelines (e.g. zinc and copper) into the NOF in the future.*
>
> *To provide for future updates of the guidelines or introduction of attributes into the NOF, species protection levels are recommended as numeric water quality goals for inclusion in the PRPN (Table 8), rather than incorporating the whole table of specific trigger values, which may change in the future.*

504. With respect to Kathryn McArthur's recommendation, I understand that if trigger values in Table 3.4.1 of ANZECC 2000, expressed as 'numeric species protection goals for toxicants, metals and metalloids for rivers' in the Proposed Plan are amended or replaced then they will only have legal effect as part of a plan or proposed plan if:[175] (a) a variation has merged in and become part of the proposed plan under Part 1, 4, or 5 (of Schedule 1 of the RMA) states that the amendment or replacement has that effect; or (b) an approved change made to the plan under Part 1, 4, or 5 states that the amendment or replacement has that effect.

505. I understand that the same legal constraints apply to the effect of expiry of material incorporated by reference. In other words, Kathryn McArthur's proposal is ultra vires.

506. Given that the default guideline values for the most relevant toxicants (copper and zinc) have been revised and are under consideration (by independent review)[176], and the Government has signalled that attribute states for copper and zinc are likely to be included in Appendix 2 of the NPS-FM, I consider on balance that it would be premature to include potentially soon to be revised 'numeric species protection goals for toxicants, metals and metalloids in the Proposed Plan.

Visual clarity

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[174] Statement of Evidence of Kathryn Jane McArthur On behalf of the Minister of Conservation. August 2018. paragraphs 101-102, page 28

[175] RMA, Clause 31, Schedule 1.

[176] http://www.waterquality.gov.au/anz-guidelines/guideline-values/default/draft-dgvs#proposed-default-guidelines-values

507. Kathryn McArthur also recommends including 'numeric water clarity goals' in the Proposed Plan. The recommended 'numeric goals' are >3 metres and no more than a reduction in 20 percent visual clarity in outstanding rivers and rivers in the sought hill river water quality FMU, and >1.6 metres and no more than a 30 reduction in rivers in the sought lowland river water quality FMU. Note that the recommended minimum 'numeric water clarity goals' do not have a compliance metric (e.g., maximum, annual maximum, annual median, etc). The justification for the recommended 'goals' is stated as follows:[177]

> *Outstanding rivers and those in the Hill country FMU should have greater clarity due to their land cover (indigenous forest in outstanding rivers) and their steeper gradient (Hill country), while lowland rivers should at least be suitable for safe primary contact. Thresholds for clarity developed by Smith and Davies-Colley (1992) have been used in Plan Change 1 for the Waikato and Waipa Rivers. These rivers are also predominantly soft-bottomed, like rivers in Northland and as such modified thresholds from Smith and Davies-Colley provide suitable guidance for the setting of numeric goals for Northland rivers.*

508. This is a simplistic proposition, including because many of Northland's rivers are not valued by local communities for primary contact recreation because they are not deep enough, are not accessible, have low natural character values, and have muddy bottoms.

509. I do not have access to Smith and Davies-Colley 1992, however I understand MfE's annual median guideline value for water clarity is 1.6 metres[178], which is identical to, according to Kathryn McArthur, what Smith and Davies recommends. The guideline pertains to primary contact recreation and trout fishing. The latter is not common in many of Northland's rivers due to climatic, geological and soil characteristics of their catchments.

510. It is very important to note current visual clarity conditions in Northland's rivers. Data collected from the council's River Water Quality Monitoring Network shows that median visual clarity in the lowland and hill river water quality FMUs suggested by Snelder (2015) are approximately 1.1 metres and 1.5 metres, respectively (based on a 5-year period ending 2013)[179]. Assuming, and probably correctly, that the median values have not changed significantly in the last 5 years, and that they are

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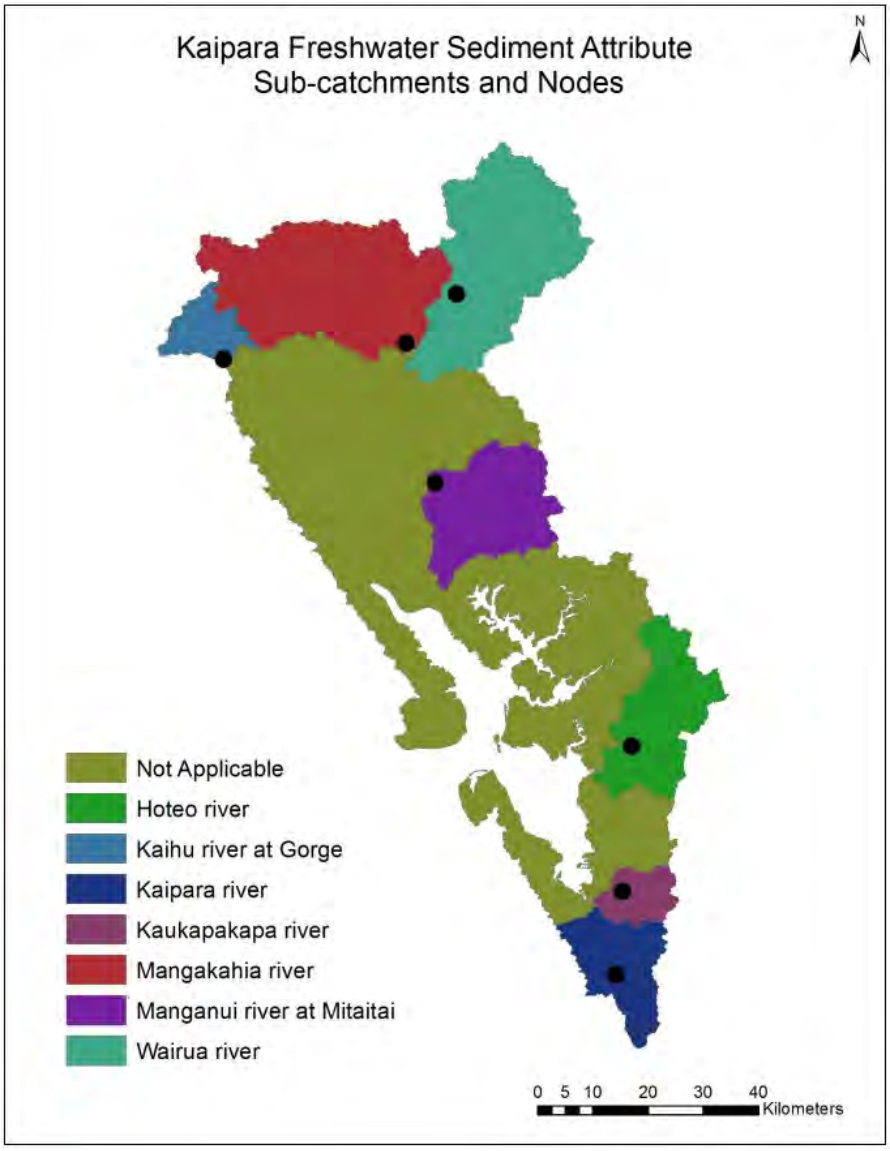
[177] Statement of Evidence of Kathryn Jane McArthur. On behalf of the Minister of Conservation. August 2018. paragraph 114, page 31.

[178] Ministry for the Environment. 1994. Water quality guidelines No 2. Guidelines for the management of water colour and clarity. Wellington, Ministry for the Environment.

[179] Snelder, T. 2015. Defining Freshwater Management Units for Northland: A Recommended Approach. LWP Client Report Number: 2015-004. Figure 4, page 22.

representative of visual clarity in Northland's streams and rivers, then it is very unlikely that the recommended 'numeric water clarity goals' are achievable.

511. For example, the Kaipara Harbour Sediment Mitigation Study (2018) found that the catchments upstream of Mangakahia River at Titoki, Manganui at Mititai and Wairua at Purua would have not be fully afforested to achieve an annual median visual clarity objective of 1.5 metres[180]. The sub-catchments are shown in the following figure (reproduced from Figure A.3.4 in Daigneault at al. 2017[181])



[180] See Daigneault, A., Dymond, J., Basher, L. 2017. Kaipara Harbour sediment mitigation study: Catchment economic modelling. Prepared for Streamlined Environmental Ltd. Landcare Research Contract Report: LC2905. http://www.knowledgeauckland.org.nz/search/?Keywords=%22KHSMS%22

[181] Ibid

512. What is more, it is important to note that the median visual clarity of the Waipoua River at SH12, which is a reach of an outstanding river draining water from a catchment largely covered by mature native bush is 2.3 metres (for the period 2005 to 2014). Achieving the recommended 'numeric water clarity goal' of 3 metres (with an assumed annual median compliance metric) would require an approximately 30% improvement in visual clarity in the Waipoua River at SH12. It is not clear how this could be achieved, and Kathryn McArthur provides no solution.

513. The high failure rate in Northland's rivers against MfE's 1994 guideline value (>1.6 metre) likely reflects the large amounts of colloidal clay in Northland's streams and rivers due to old weathered volcanics and brown/yellow earths that are widespread in the region.

514. Very recently, the Government issued a document that sets out its "plan to restore and protect freshwater in New Zealand [which] outlines the work programme that will set New Zealand on the path to turning around water quality trends and make long term improvements in freshwater."[182]

515. The document states that Government is considering potential new attributes – sediment, copper, zinc, and dissolved oxygen – to be included in the NPS-FM, and that public consultation will be held on the amendments in 2019 and the amended NPS-FM will be in force by 2020. I understand that the sediment attribute states (recommended by NIWA and Cawthron) include bottom lines for visual clarity, turbidity and deposited sediment and that it is likely that they, or close variants of, will be included in the NPS-FM. I also understand that the recommended attribute state for visual clarity as it relates to ecosystem health is significantly lower than the 'numeric water clarity goals' recommended by Kathryn McArthur.

516. In summary, I consider that the recommended 'numeric water clarity goals for Northland Rivers':

- do not appear to be relevant to Northland's rivers;
- do not appear to be achievable based on the council's River Water Quality Monitoring Network data; and

[182] https://www.mfe.govt.nz/node/24402/

- are markedly different from the proposed ecosystem health thresholds (attribute states) for suspended and deposited sediment in New Zealand rivers and streams).

517. I consider that the 'numeric water clarity goals' recommended by Kathryn McArthur should not be included in the Proposed Plan.

Fine deposited sediment cover

518. Kathryn McArthur recommended including 'numeric goals for fine sediment in naturally hard-bottomed rivers in Northland (see Table 13 in McArthur 2018). I understand that the Cawthron Institute and NIWA have delivered a report to Ministry for the Environment setting out numeric states for deposited sediment (% fine sediment cover (precentage cover <2 mm) the streambed). I also understand that the attribute states differ significantly from the 'numeric goals for fine deposited sediment' recommended by Kathryn McArthur. The Government has announced that it will likely amend the NPS-FM in 2020 including by including attributes for sediment, of which deposited sediment is likely to be one. I recommend not including the 'numeric goals' sought by the Minister of Conservation

E.coli

519. *E.coli,* which is a faecal indicator of the presence of pathogens in water, is a water quality attribute for the compulsory national value of health for recreation.

520. Appendix 2 of the NPS-FM sets out the compulsory attribute states and associated compliance metrics for *E.coli.* In other words, the NPS-FM contains attribute states for *E.coli* that cannot be ignored or disregarded.

521. Kathryn McArthur, on behalf of the Minister of Conservation, states that "[t]he objectives for primary contact suitability in the 2017 NPS-FM are more permissive that in previous objectives [sic] (McBride and Soller 2017), and human health for recreation is a compulsory national value without the 'secondary contact' caveat from the 2014 version of the NPS-FM."[183] Kathryn McArthur then states:[184]

[183] Statement of Evidence of Kathryn Jane McArthur. On behalf of the Minister of Conservation. August 2018. paragraph 116, page 32.
[184] Ibid, paragraphs 117 and 118, page 32

Northland's rivers generally have high levels of E.coli which affect primary contact values, and are unlikely to meet regional or national targets. Numeric goals for E.coli to enable safe primary contact with freshwater more of the time are needed in Northland and will require management through the Plan if they are to be achieved.

E.coli is primarily a diffuse sourced water quality problem via two pathways. Firstly, direct access of stock to freshwater, and secondly via overland flows, often associated with run-off from agricultural land. In order to support human health for recreation, as a compulsory value, both pathways of faecal contamination will need to be managed in the Plan, along with reducing sedimentation of rivers, which can harbour and resuspend E.coli during high flow events in pastoral streams (Nagels et al. 2002).

522. On a technical note, first it is not clear what is meant by statement that *E.coli* levels in Northland's rivers are unlikely to meet regional or national targets. There are no prescribed regional targets. Rather, Policy A6 directs every regional council to develop regional targets to improve the quality of fresh water in specified rivers and lakes[185] and contribute to achieving the national target in Appendix 6 and ensuring: (a) draft regional targets are available to the public by 31 March 2018; and (b) final regional targets are available to the public by 31 December 2018.

523. Regional information for setting draft targets for swimmable lakes and rivers is set out in Ministry for the Environment 2018[186] indicates that approximately 23% of Northland fourth order and larger rivers are 'swimmable'. Approximately 48% are in the E attribute state ("poor"), 23% are in the D attribute state ("intermittent") as defined in Appendix 2 of the NPS-FM. I have reproduced Figure 6 from MfE 2018 which shows modelled *E.coli* statistics for Northland's fourth order and larger river with respect to the *E.coli* attribute states in Appendix 2 of the NPS-FM. The modelled states are very similar to actual states (based on monitoring data).

[185] "Specified rivers and lakes" means: (a) rivers that are fourth order and above using methods outlined in the River Environment Classification system, National Institute of Water and Atmospheric Research, Version 1; and (b) lakes with a perimeter of 1.5 kilometres of less.

[186] Ministry for the Environment. March 2018. Regional information for setting draft targets for swimmable lakes and rivers. Published by the Ministry for the Environment on behalf of a joint taskforce of central and local government representatives.

524. The projected improvement of approximately 2 percent is based on implementing the previous government's proposed Stock Exclusion Regulations..

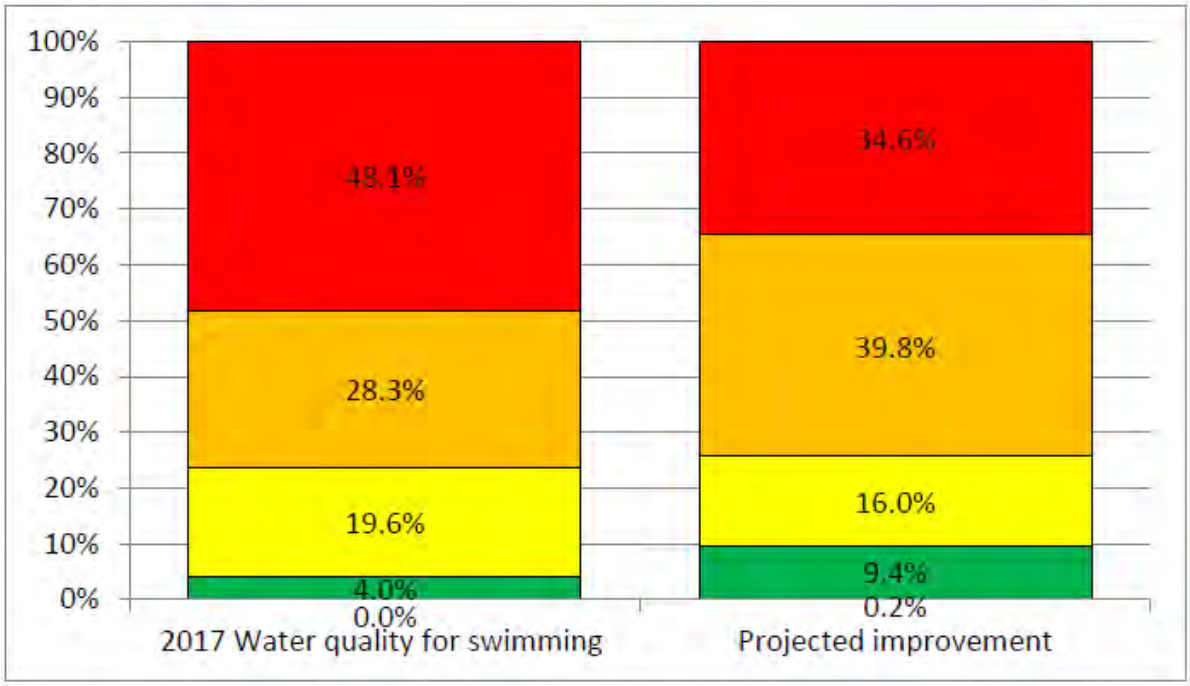


Figure 6: Projected improvement in water quality for swimming of Northland's rivers

525. Second, *E.coli* also enters water via direct (i.e., point source) discharges, e.g., farm dairy effluent discharges, stormwater discharges, and direct defecation from animals into streams and rivers is a point source discharge.

526. Kathryn McArthur recommends including 'numeric *E.coli* NOF band goals' for outstanding rivers and rivers in the sought hill and lowland river water quality FMUs. The recommended 'goals' are based on and the A *E.coli* attribute state for outstanding rivers, B *E.coli* attribute state for hill rivers, and the *E.coli* attribute state for lowland rivers. However, Kathryn McArthur did not attempt to quantity or indeed assess the impact of including the 'numeric goals' in the Proposed Plan. I understand that they are unlikely to be achieved without significant land use change and perhaps may be unachievable even then.

527. For example, Northland Regional Council has monitored *E.coli* levels in the Waipoua River (an outstanding river draining and native forested catchment, i.e., the Waipoua forest) at DoC HQ swimming hole monthly for just over 12 years. Based on the *E.coli* data, the swimming site on the river falls within the D attribute state for primary contact recreation, i.e., the lowest grade in the NPS-FM. Another site on the Waipoua River (at

SH1) is within the C attribute state ("fair"). Research suggests that some types of *E.coli* may be the result of naturalised E*.coli,* which refers to *E.coli* that (with or without faecal inputs) may be capable of persisting in the environment.

Benthic cyanobacteria

528. Finally, Kathryn McArthur stated that a maximum "benthic cyanobacteria cover...[of] 20% is recommended as the maximum amount of cover for a numeric goal for all rivers in Northland utilised for primary contact."[187] The NPS-FM does not make any reference to cyanobacteria cover. Instead, the NPS-FM requires regional councils to include numeric freshwater quality objectives for cyanobacteria using the attribute states (expressed as mm^3/L biovolume of cyanobacteria). The council has committed to including such objectives in the Proposed Plan by way of a plan change in 2021.

Lake water quality standards

529. I recommend that the lake water quality standards (as notified) are reintroduced into the Proposed Plan, as set out in the Council's NPS-FM Implementation Plan - as requested by Minister of Conservation.

Coastal sediment quality standards/guidelines

530. I recommend that the coastal sediment quality guidelines in Appendix H.5 of the Proposed Plan are renamed as coastal sediment quality guidelines and a note is added to the table that the values are for total recoverable concentrations of metal by dry weight, as per the recommendation of Richard Griffiths (Coastal Scientist, Northland Regional Council). The recommendation is set out in his report that I have appended to this document (Appendix 11).

Conspicuous change in colour or visual clarity of water

531. Northland Fish and Game sought a definition of the term "conspicuous change in the colour of visual clarity" [of water].[188] After further considering the submission and evidence of Northland Fish and Game, I consider that the term should be defined in

[187] McArthur 2018. paragraph 126, page 34
[188] Submission on Northland Regional Council's Proposed Regional Plan. Northland Fish and Game. November 2017. Page 12.

the plan and in a way that is consistent with its use in the Regional Water and Soil Plan, as follows:

> *Means more than a 40% reduction in the colour or visual clarity above background levels in rivers, artificial watercourses and wetlands, except for lakes and coastal waters where it means more than a 20% reduction in the colour or visual clarity.*

Policy to maintain overall water quality

532. I recommend that Policy D.4.5 is reintroduced, as sought by submitters, and is amended in some respects to clarify its relationship with the water quality standards and coastal sediment quality guidelines, and the need to maintain overall water quality generally.

Zone of reasonable mixing

533. Gerard Willis, for Fonterra Co-operative Group Ltd, stated:

> *Fonterra's submission seeks that Policy D.4.8 be deleted and that the issues associated with the "zone of reasonable mixing" be addressed through a definition of that term consistent with how the zone of reasonable mixing is provided for in Rule 2.3(b).*
> *...*
>
> *In my opinion a greater level of certainty can be provided by amending the final part of the definition proposed in the s42A Report as follows:*
>
> *For the purpose of activities that require resource consent, the zone of reasonable mixing will be determined consistent with 1) and 2) above unless the scale and concentration of the discharge demands that a case-by-case basis determination is more appropriate, in which case, the extent of departure from the zone defined by 1) and 2) above shall be determined in accordance with D.4.8 'Zone of reasonable mixing'.*

534. I support the recommendation and consider that it should be adopted.

Wetland, beds of lakes and rivers, damming and diverting water

Author: James Griffin and Michael Day

Hearing panel requests

Significant wetland definition – How can a river be a wetland?

535. A river cannot be a wetland. However, the "bed" of a river or lake can. Note: a wetland can be land under RMA s.9, or under RMA s.13, the bed of a river or lake i.e. area covered when either: a river is at its fullest flow without overtopping its banks; or a lake where it reaches its highest level without overtopping its margins. (James Griffin)

Significant wetland definition – What's an 'ephemeral wetland' and a 'flush'?

536. The different wetland types referred to in the plan refer types used in the RPS, that reference the report describing wetland types of New Zealand: *Johnson, P.; Gerbeaux, P. 2004. Wetland types in New Zealand. Department of Conservation, Wellington*[189]. The list of wetland types includes "ephemeral wetlands", and therefore I recommend retaining this term. However, use of "flush" is redundant as "seepage" has the same meaning, therefore I recommend deletion of "flush". (James Griffin)

Significant wetland definition – are 1 to 5 straight out of the RPS?

537. *Yes.* However, I now recommend the above minor amendments for clarification. Also, for the reasons given by Cathcart, B, I recommend the use of "wet heathland" as a substitute for "pakihi". (James Griffin)

"Channel" and "bank full edge" definitions – NES Forestry has a good definition for bank-full channel width. Staff to consider.

538. Whangarei District Council has requested that the Proposed Plan defines 'channel' and 'bank full edge' in the context of conditions 6 and 7 of rule C.2.1.3 of the Proposed Plan[190]. The Hearings Panel has requested staff to consider the definition of 'bank-full

[189] https://www.doc.govt.nz/documents/science-and-technical/WetlandsBW.pdf

[190] See page 17 of Statement of Andrew Carvell on behalf of Whangarei District Council and the Far North District Council, 14 August 2018

channel width (contained within the National Environmental Standard for Planation Forestry) and formulate a view whether this would provide assistance to plan users with regards to interpreting rules.

> ***Bank-full channel width*** *is defined as – means the distance across a river channel formed by the dominant channel-forming flow with a recurrence interval seldom outside a 1 to 2-year range (measured at a right angle to the channel flow).*

539. Whangarei District Council consider that conditions 6 and 7 of rule C.2.1.3 are contradictory, as condition 6 enables 'channels' to be widened by up to 20% and condition 7 states that *any diversion of water, or realignment of the bed of the river is restricted to within the back full edge.*

> *The Section 42A hearings report for Wetlands, beds of lakes and rivers and damming and diverting water contains the following statement in relation to the submitter's relief sought:*
>
> *I do not support the relief sought by the submitters as I do not see a contradiction. A 'channel' is where water flows within the bed of a river and is related to primarily gravel beds. If the channel happens to be the whole 'bed of the river' (i.e. incised stream in clay), then applicants cannot re-align the bed of a river. The bottom line is that to comply with this rule, works have to be within the bank full edge of a river.*

540. While the operative Regional Water and Soil Plan for Northland does not define 'channel', it does define 'bank full edge' as follows:

> ***Bank Full Edge*** *– In relation to a river, is the highest point at which the river can rise without overtopping the bank and in the case of a lake or wetland the point at which the waters cover at the highest level without exceeding its margin.*

541. After consideration, my view is that in the context of permitted activity rules (C.2.1.3 and C.2.1.11) and members of the public being 'easily' able to interpret provisions of the plan to enable compliance with rules, the definition of 'bank-full channel width' is not appropriate. This is because I consider that it is too complicated to be easily understood by a member of the public (such as having to identify whether the channel-forming flow has a recurrence interval seldom outside a 1 to 2-year range). I sought the advice of Stuart Savill (NRC Consents Manager) and he agreed with my thoughts.

542. So, after considering all evidence, I am recommending to define bank full edge (to be included within rules C.2.1.3 and C.2.1.11) as I believe it will assist with rule interpretation and is a definition that is already 'in use' in Northland and is therefore familiar. I am still of the view that a definition for channel is not required.

Response to other matters and recommended changes

Definition – Flood defence

543. In response to evidence from Cath Heppelwaithe[191] (paragraph 8.14), I am recommending a minor amendment to the definition of 'flood defence'. I consider that by clarifying that the definition only applies to floodwater (rather than any water), it will provide clarity that to be considered a flood defence, the listed structures must manage flood water – rather than water generally.

Rule C.2.1.2 Extraction of material from rivers - permitted activity

544. Based on evidence from Rosemary Miller and Graeme Silver[192], I recommend amendments to the conditions to better protect freshwater values, including indigenous freshwater fish. Specifically, an amendment to condition 4) to include the text *graded to natural contours (generally avoiding dips, humps and hollows.* I also recommend a new condition with words to the effect that there is no stockpiling of extracted gravel on the river bed.

545. Additionally, in response to evidence from Sarah Ongley[193], I recommend the inclusion of a new condition, stating: *the activity does not impede existing legal public access to the river*. I consider this will assist with giving effect to s6(d) of the RMA. I also recommend the inclusion of this condition in rule C.2.1.3.

Rule C.2.1.5 Maintenance or repair of authorised flood defence – permitted activity

546. After considering all evidence, I recommend several amendments to rule C.2.1.5. Firstly, in response to evidence from Cath Heppelthwaite[194] (paragraph 9.31), I recommend the insertion of the following text at the start of the rule: *Notwithstanding any other rule in section C.2.1 of this Plan, the maintenance...*

547. Secondly, in response to evidence from Andrew Carvell[195] (paragraph 108), I recommend the insertion of the following text at the end of condition 1) *other than as required to provide for the settlement of earthen stopbanks.*

---

[191] On behalf of New Zealand Transport Agency
[192] On behalf on the Minister of Conservation
[193] On behalf of Northland Fish and Game
[194] On behalf of New Zealand Transport Agency
[195] On behalf of Whangarei District Council

Rule C.2.1.8 and C.2.1.9

548. I recommend these rules reference the Department of Conservation in reflection of DOC responsibilities for fish passage in response to evidence from Natasha Katherine Petrove on behalf of DOC.

Rule C.2.1.10 - Construction and installation of structures – permitted activity

549. I recommend alignment with the New Zealand NZ Fish Passage Guidelines[196] as requested by Heppelthwaite[197] regarding clause (f) culvert installation.

550. I agree with reasons provided in Fish and Game[198] evidence that requested an increase in permitted maimai area from $5m^2$ to $10m^2$ and recommend amendment to clause (6) and accordingly a consequential change to provision for maimai in Rule C.2.2.2.

Rule C.2.1.12 - Freshwater structures– controlled activity

551. I agree with the joint evidence from Whangarei and Far North District Council that requested an exemption from clause (2) for culverts beneath public road, so that should a longer culvert be necessary, the activity remains a controlled.

552. Northland Fish and Game Council agree with Northland Fish and Game Council request to amend text so that it better aligns with RPS Policy 4.7.1 (j) regarding public access.

Response – wetland definitions, rules and policy

553. Hearing evidence from several submitters (including: Cathcart, Fish and Game, Wilson, Horticulture NZ, GBC Winston, Federated Farmers, NZTA) requested numerous minor amendments to wetland definitions. I agree, where requests reduce ambiguity and provide clarification as shown in *Reply Report Tracked Changes Version of the Plan*.

554. In response to discussion during the hearing regarding ephemeral streams, I would like to provide comment on the relationship between natural wetlands and streams.

---

[196] New Zealand Fish Passsage Guidelines for structures up to 4m, Appendix G(2)(d)
[197] NZTA Heppelthwaite, para 9.37
[198] F&G, Heotjes, para 30

Given the short periods that water flows in ephemeral streams, they generally have low aquatic ecological values and quite appropriately are recommended for exclusion from numerous provisions protecting in-stream values. However, I do not agree that ephemeral streams should be excluded from the 'natural wetland' definition. I believe this would result in a meaningful proportion of wetlands being excluded from the natural wetland provisions. This is because the margins of most swamps and some fens include either ephemeral or intermittently flowing streams that perform important ecological functions e.g. fish passage, albeit for short periods closely associated with individual rainfall events.

555. I recommend numerous amendments to the rules in the wetlands section for clarification and to improve alignment with RMA section 13.

Rule C.2.2.2 - Structures in wetlands – permitted activity

556. KiwiRail, Beal, para 53, and Whangarei District Council requested amendment to permit infrastructure maintenance activities that are in wetlands and I tend to agree, however recommend that the extent of disturbance is limited to 200m^2 in significant wetlands. This area reflects the extent of permitted mangrove removal associated with existing infrastructure. Although not included in recommendations, a more permissive alternative I considered was to distinguish between core local and significant regional infrastructure, by providing a greater permitted disturbance for the latter, such as 2000m2 (in alignment with permitted wetland disturbance associated with stock access Rule C.8.1.1 and C.8.1.2).

557. All remaining recommended amendments to Rules C.2.2.1 to C.2.2.5 are either for clarification or because of amendments recommended in other sections.

C.2.3 General conditions

558. I accept the evidence from WDC and FNDC[199] that the signage requirements of Condition 20 are onerous, and therefore recommend deletion.

559. All remaining recommended amendments to the general condition text are either for clarification or because of amendments recommended in other sections.

[199] WDC, FNDC, Devine EIC para 41

C.3 Damming and diverting water

560. All recommended text amendments to the Damming and diverting water section, are either for clarification (including from S42A staff response to commissioner questions) or because of amendments recommended in other sections.

Appendix 1: Ricky Eyre - Expert Opinion

Ricky Eyre -Expert Opinion

Response to submission on the Proposed Plan for Northland by Yachting New Zealand

Date: 19/10/2018
Author: Ricky Eyre
Version: Final

Northland REGIONAL COUNCIL

Table of contents

Purpose of this report

1. This report has been prepared on request by Michael Payne, Policy Analyst, to provide comment on the submissions by Yachting New Zealand (YNZ), with particular regard to the enforcement (or enforceability) of the vessel sewage discharge and anchoring rules of the Proposed Plan for Northland.

2. This report should be read in conjunction with the submission and legal submission on the Proposed Plan for Northland by Yachting New Zealand

Report Author

3. My Name is Ricky Eyre. I am employed by the Northland Regional Council as the Coastal Monitoring Manager. I have been in this role for 7 years, and employed within the council's coastal team for 12 years.

4. My team's (Coastal Monitoring) responsibilities include monitoring coastal resource consents, State of the Environment monitoring, and incident response. This includes the education and enforcement of the Marine Pollution Regulations.

Enforcement of Rules

Evidence of vessel anchoring

5. Rule C.1.2.1 relates to the occupation of space by a vessel in the common marine and coastal area. The enforceability of rule C.1.2.1 is commented on in paragraph 41(b) of YNZ's submission and in paragraph 76 of Mr Brabant's legal submission

6. A variation of this rule exists in the operative Coastal Plan for Northland[1]. When enforcing this current rule, council undertakes ongoing inspections and/or deploys fixed cameras. Fixed cameras are particularly useful in collecting sufficiently robust evidence in these cases. In the future, emerging technology such as (freely available) current satellite imagery may be used.

7. In 2015 the Environment Court granted enforcement orders (upon application of the council) against an individual to refrain from anchoring his vessel in the Whangarei Harbour. In that case the individual had anchored his vessel in excess of 14 consecutive days in the Whangarei Harbour[2]. The Environment Court was satisfied with affidavits from council officers and daily photographs taken of the vessel as sufficient evidence to demonstrate non-compliance with the rule.

8. While demonstrating the length of time a vessel is anchored takes time and effort, I believe rules with such restrictions can (and have) been enforced.

Discharge of sewage

[1] Rules 31.3.9(a) and 31.4.9(a)
[2] Rule 31.4.9(a)

9. Rules that focus on the physical act of discharging untreated sewage from vessels, such as those found in the Resource Management (Marine Pollution) Regulations 1998 and rule C.6.9.7 of the Proposed Regional Plan are very difficult to enforce. Most systems discharge below the waterline and are likely to go unseen. Even reported discharges are difficult to enforce due to the high burden of proof required to take enforcement.

10. Council has only once been able to undertake enforcement action for a discharge of sewage from a vessel after being provided with a set of photographs from a landowner adjacent a popular anchorage which provided clear evidence of a sewage discharge from a vessel. In this case the discharge was sewage in a bucket being thrown overboard.

11. The relevant rule of concern regarding enforceability is C.1.2.2. Note that the following references to clauses in C.1.2.2 is to the S42A version of the rule.

12. C.1.2.2(1) sets out requirements for what sewage containment facilities a vessel must be equipped with to be able to overnight in a marine pollution limit[3]. Council has no right to enter a vessel to assess compliance with clause (1), and therefore C.1.2.2(4)(a) and (b) are critical to assess compliance with this rule.

13. C.1.2.2 (2) and (5) are easily enforceable with fixed cameras, as described above, and GPS positioning.

14. C.1.2.2(3) will be very difficult to enforce. While it is relatively straightforward to obtain evidence that a vessel has (not) moved with a fixed camera, it would be very difficult to prove that someone has not legally disposed of the sewage from a portable toilet.

15. In regard to C.1.2.2(4)(c), I agree with paragraph 43(c) of YNZ's submission that it would be impractical for a vessel owner to provide electronic records of movement and any written evidence provided to council is open for misrepresentation.

16. Council does not have the means or resources to actively monitor all vessels within Northland to ensure compliance with rule C.1.2.2; nor would it intend to. Again, a variation of this rule exists in the operative Coastal Plan for Northland[4]. We have issued a small number of abatement notices against this rule only, and only after informal action failed.

Discharges of Sewage from Vessels into Coastal Waters

17. In paragraphs 85 and 86, Mr Brabant comments on a lack of evidence to justify extending the "no discharge limits". It is true that there is a paucity of evidence on the incidence of, and effects of, discharges from vessels; illegal or otherwise. It is highly unlikely council would witness untreated sewage discharges, and we do not undertake a sampling program to assess effects of sewage discharges from vessels due to resourcing and limitations on the effectiveness of such a program. Therefore, it is difficult to provide evidence on the occurrence of discharges from vessels and any resulting effects.

[3] Mapped in the Proposed Regional Plan.
[4] Rule 31.6.8(a)

18. A recent report[5] investigating nine illness outbreaks of shellfish consumption from oyster farms (including Northland case studies) identify vessels as a potential source of the contamination in at least one case.

19. Council undertakes on-water marine pollution patrols at popular anchorages over the summer period, focussing on education and undertaking surveys of peoples means of complying with the regulations. Over the 2017/18 period, ~5% of people openly admitted to the council they had no means of containing or treating their discharges. In my opinion, this justifies the need for rule C.1.2.2.

[5] Improving the Management of the Risk of Human Enteric Viruses in Shellfish at Harvest Case Studies of Oyster Growing Areas Implicated in Norovirus Illness Events. Hay et.al. 2013. http://safefish.com.au/Reports/Manuals-and-Technical-Guidelines/Improving-the-management-of-the-risk-of-human-enteric-viruses-in-shellfish-at-harvest

Appendix 2: Legal advice – land-based effects and national policy statements

Legal advice on the validity of managing land-based effects through regional plan provisions

WYNNWILLIAMS
LAWYERS

23 August 2018

Attention Ben Lee

By email: BenL@nrc.govt.nz

Northland Regional Council
Private Bag 9021
WHANGAREI 0148

Dear Ben

PROPOSED REGIONAL PLAN FOR NORTHLAND – ABILITY TO ADDRESS EFFECTS ON LAND-BASED VALUES

1. Northland Regional Council (**Council**) has recently notified the Proposed Regional Plan for Northland (**pRPFN**). The pRPFN is a combined regional coastal plan and also a regional plan.

2. We understand that several provisions of the pRPFN, including Policy D.2.9 (which was drafted as a recommended inclusion in the s42A report), seek to address land-based effects of activities occurring within the CMA. We understand that there are similar provisions in relation to freshwater bodies.

3. A question has arisen regarding whether some of these provisions may be ultra vires in that they purport to manage functions that are outside the scope of section 65 and 68 of the Resource Management Act 1991 (**RMA**).

4. In particular, you have asked us to consider whether a regional plan and/or regional coastal plan can include provisions (objectives, policies and/or rules) to manage effects on land-based values and/or require the provision of land-based infrastructure, from activities that take place within the coastal marine area (**CMA**) and freshwater bodies?

5. As a related issue, some controlled and restricted discretionary rules in the pRPFN require the consideration of effects on outstanding natural features and outstanding natural character without qualifying whether they are on the land or in the water. You have asked whether a regional plan and/or regional coastal plan can include rules that require the consideration of the effects of an activity on outstanding natural features (**ONF**) and outstanding natural landscape (**ONL**) areas mapped on land (e.g. outside the coastal marine area and freshwater bodies), or is the consideration of these effects limited to ONFs and ONLs mapped in the coastal marine area and freshwater bodies?

Executive summary

6. To the extent that the pRPFN is a regional coastal plan, we consider that the pRPFN can include objectives and policies relating to managing the effects on land-based values and requiring the provision of land-based infrastructure for activities within the CMA where the objectives and policies relate to integrated management. In this situation the objectives and policies will fall within the Council's functions under

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section 30(1)(a). Notably, section 64 of the RMA places no constraints on a regional council in relation to the functions for which a regional coastal plan can be prepared.

7. We do not consider that the Council can include rules within the pRPFN which seek to control land for the purposes of integrated management as these will be ultra vires under section 68(1) of the RMA.

8. However, in our opinion it is open to the Council to include matters of discretion in relation to rules falling within the Council's functions under section 30(1)(d) which seek to address the 'on-land' effects of these activities. This will depend on the Hearing Panel being satisfied that the matters of discretion relate directly to the actual or potential effects of the use, development or protection of land (within the CMA) under section 30(1)(d)(v), rather than being a matter of discretion in relation to the control of land on the landward side of mean high-water springs.

9. To the extent that the matter of discretion relates to the Council's integrated management functions under section 30(1)(a), we consider that section 68 does not extend to prohibiting a rule which regulates activities in the CMA from including a matter of discretion relating to land-based effects and the provision of land-based infrastructure. However, this is untested, and we cannot rule out such a matter of discretion being considered ultra vires if this matter were challenged.

10. We consider that the same position applies in relation to regional plan provisions (as opposed to regional coastal plan provisions). While section 65(1) only enables a regional plan to be prepared in relation to the specific functions listed in the section (which do not include integrated management of resources), we do not consider that this prohibits a Council from including an objective or policy in a regional plan which seeks to address the 'on-land' effects associated with an activity occurring within a freshwater body where that objective or policy relates to the Council's integrated management functions under section 30(1)(a). This is because sections 63 and 66 of the RMA require regional plans to be prepared in accordance with all of the Council's functions under section 30 of the RMA. If Parliament had intended that regional plans could not include objectives and policies in relation to its integrated management functions then these sections would have reflected this and there would have been no need for section 68(1) to limit the Council's rule making powers in relation to its section 30(1)(a) and 30(1)(b) functions.

11. In relation to ONL and ONFs in our opinion the fact that a regional council's functions do not extend to controlling land which comprises an ONL or ONF, does not prohibit it from considering the effects on 'on-land' ONLs and ONFs from activities that occur within the CMA and freshwater bodies where the activities being regulated fall within the Council's functions. For similar reasons to the above, we also consider that the Council may include matters of discretion or control within its rules which do not delineate between CMA ONLs and ONFs and on-land ONLs and ONFs (provided the activities being regulated fall within the Council's functions). Although we do note it will not fall within the Council's jurisdiction to map on-land ONLs and ONFs.

Extent of Council functions in relation to regional coastal plans

12. Given that the RMA addresses regional coastal plans separately from regional plans we have considered the position in relation to the CMA and other freshwater bodies separately.

13. The purpose of regional plans (which are defined to include a regional coastal plan) is to assist a regional council to carry out any of its functions in order to achieve the purpose of the RMA.

14. Under section 64 of the RMA, there must be, at all times, for all of the CMA in the region, one or more regional coastal plans prepared in the manner set out in Schedule 1. The CMA is defined in the RMA as being the foreshore, seabed and coastal water, and the airspace above it, of which the landward boundary is generally the line of mean high water springs. Within the CMA itself (i.e. the seaward boundary of mean high water springs), section 30(1)(d) provides the regional council with the function to control (in conjunction with the Minister of Conservation) "land and associated natural and physical resources".

15. Section 64 (unlike section 65 in relation to other regional plans) does not purport to restrict the functions under section 30 that a regional coastal plan can be prepared for. In fact, section 64 explicitly recognises the integrated management issues and recognises that activities within the CMA, may also have effects that cross this boundary. Section 64(2) provides that:

> ...a regional coastal plan may form part of a regional plan where it is considered appropriate in order to promote the integrated management of the coastal marine area and any related part of the coastal environment.

16. A regional coastal plan, and a regional plan, must comply with the other statutory obligations in the RMA, including to give effect to the New Zealand Coastal Policy Statement, any national policy statements and the regional policy statement under section 67.

17. In the case of the pRPFN, where a combined regional coastal plan and regional plan has been prepared a question arises regarding the extent of the Council's functions to control land or consider effects on the landward side of mean high-water springs, particularly where this is necessary to achieve integrated management.

18. In the case of a regional coastal plan, sections 63, 64, 66, 67 and 68 are the key sections applying to the preparation and change of this part of the pRPFN.

    a. Section 63 and 66 require a regional coastal plan to be prepared in accordance with the Council's functions under section 30 of the RMA.

    b. Section 64 of the RMA does not contain any limit on the functions for which a regional coastal plan can be prepared for.

    c. Section 67 requires a regional plan to state the objectives for the region, and policies to implement the objective and the rules (if any) to implement the policies.

19. In respect of the Council's functions under section 30, the most relevant functions in this situation are: [1]

    a. Section 30(1)(d) which clearly provides the Council with functions within the CMA itself and in relation to the actual or potential effects of the use, development or protection of land within the CMA.

    b. Section 30(1)(a) also provides the Council with the function for "the establishment, implementation, and review of objectives, policies, and methods to achieve integrated management of the natural and physical resources of the region."

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[1] Section 30(1)(gb) provides for the strategic integration of infrastructure with land use through objectives, policies and methods. However, we do not consider that the definition of infrastructure will extend to parking facilities and have therefore not considered this further.

20. While regional councils have some functions in relation to the use or control of land (above mean high water springs) these are limited to those in section 30(1)(c)[2] and some other parts of section 30(1)[3], none which would be relevant in the case of the matters that the Council is seeking to control in this situation.

21. This is contrasted with the function of a territorial authority, for which section 31 provides:

> The control of any actual or potential effects of the use, development or protection of land.

22. This demonstrates that the direct control of land-based issues such as a lack of parking or suitable infrastructure is within the control of the territorial authority, as it is not for one of the narrowly specified purposes in section 30(1)(c) or the other section 30 functions which seek to control land.

23. However, in this case the Council is not seeking to directly control land, but is instead seeking to include objectives and policies, and matters of discretion within rules which relate to the land-based effects of activities occurring in the CMA. Accordingly, we consider the application of the Council's functions under section 30(1)(d) and section 30(1)(a) further as follows.

Extent of functions under section 30(1)(d)

24. Section 30(1)(d) provides the Council with the function to control (within the CMA) relevantly:

    a. land and associated natural and physical resources (section 30(1)(d)(i)); and

    b. any actual or potential effects of the use, development or protection of land, including the avoidance or mitigation of natural hazards (section 30(1)(d)(v)).

25. It is clear that section 30(1)(d) provides the Council with the function to control land within the CMA itself. However, there is limited case law specifically considering the extent of the Council's functions under section 30(1)(d)(v) and whether or not this extends to considering land-based effects.

26. Based on a plain reading of section 30(1)(d), to the extent that the land-based effects are an actual or potential effect of the use or development of land within the CMA, then we do consider that these will fall within the Council's functions under section 30(1)(d)(v).[4]

27. There is limited case law addressing this issue. In *Auckland Yacht and Boating Association v Waikato Regional Council*[5] the Environment Court considered whether it should impose controlled activity status or discretionary activity status for certain activities relating to existing marine farms. One of the matters of control was in relation to the nature of disturbance to natural character of the land.

28. The Court stated:

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[2] Being to control the use of land for specific purposes, such as soil conservation, maintenance and enhancement of ecosystems and the quality of water, and the avoidance or mitigation of natural hazards.

[3] See *Federated Farmers of New Zealand v Manawatu-Wanganui Regional Council* [2011] NZEnvC 403.

[4] Although noting that section 30(1)(d)(v) is concerned with the use of land within the CMA only, not the use of land more generally. See *Challenger Scallop Enhancement Company Ltd v Marlborough District Council* [1998] NZRMA 342.

[5] *Auckland Yacht and Boating Association v Waikato Regional Council* EnvC Auckland A211/2002, 31 October 2002.

> ...we agree with the case put forward by the appellant that, critical to sustainable use and development of natural and physical resources in relation to marine farming opportunities in the CMA, is the potential for adverse environmental effects, including cumulative effects on the coasts environment.[6]

29. In the end, the Court held that discretionary status would be more appropriate, however, there is no suggestion in this case, that a Council could not consider the land-based effects of an activity occurring within the CMA when making rules in a regional coastal plan.

Extent of functions under section 30(1)(a)

30. We have also considered the extent of the Council's integrated management functions under section 30(1)(a) where these functions would address the landward effects of activities occurring within the CMA.

31. As set out above, sections 63 and 66 require a regional coastal plan to be prepared in accordance with the Council's functions under section 30 of the RMA and section 67 requires a regional plan to state the objectives for the region, and policies to implement the objective and the rules (if any to implement the policies). Section 64 does not limit the functions for which a regional coastal plan can be prepared.

32. Accordingly, we do not consider that there is any jurisdictional constraint on including objectives and policies in the regional coastal plan where these relate to integrated management.

33. However, the position in relation to rules is different.

34. Relevantly in this situation, section 68 provides that:

> (1) A regional council may, for the purpose of—
>
> (a) Carrying out its functions under this Act (other than those described in paragraphs (a) and (b) of section 30(1)); and
>
> (b) Achieving the objectives and policies of the plan,—
>
> include [rules in a regional plan].

35. In our opinion, this means that rules that purport to apply to control land in order to achieve integrated management will be ultra vires.

36. The decision of the Environment Court in *Wainui Beach Protection Society v Gisborne District Council*[7] describes this distinction:

> Policies, objectives, and rules control activities in the coastal marine area component (CMA). The landward portion contains no rules about activities, but provides objectives and policies to assist in consideration of resource consents for land use activities.

37. For this reason, we consider that the Council is not able to include rules within the pRPFN that control the use of land in terms of the effective provision of infrastructure or land based activities, even though those rules might be addressing the integrated management of resources. We specifically address the matter of discretion proposed by the Council further below.

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[6] *Auckland Yacht and Boating Association v Waikato Regional Council* EnvC Auckland A211/2002, 31 October 2002, at [77].

[7] *Wainui Beach Protection Society v Gisborne District Council* EnvC. A113/2004 Auckland, 25 August 2004. at [11].

38. We note that the Environment Court decision in *Careys Bay Association Incorporated v Dunedin City Council*[8] dealt with a similar issue, but in relation to the extent to which a territorial authority could control activities in the CMA. In this case, the issue largely concerned whether the Dunedin City Council had jurisdiction to include rules in their District Plan to take into account noise created within the CMA. In this instance, noise was being emitted by ships within the CMA.

39. The Environment Court defined the role of a territorial authority, and held that a territorial authority is limited by the boundaries of its district.[9] The Court determined that section 31 of the RMA did not authorise the territorial authority to directly or indirectly control activities outside its territorial area.[10] Ultimately, the territorial authority could control noise emitted by the Port (being landward of the CMA), but it was up to the regional council to control the noise emitted from within the CMA.

Is a matter of discretion part of a rule for the purposes of section 68?

40. The Council's section 42A report includes within Rule C.1.2.8 a matter of discretion for certain moorings in specified mooring zones "effects on parking, toilet facilities, refuse disposal and dinghy storage." The rule only proposes to address the 'land-based' issues as a matter of discretion. The rule does not directly purport to control the use of land.

41. In relation to the potential for overlap between regional council and territory authority rule making functions the Court of Appeal decision in *Canterbury Regional Council v Banks Peninsula District Council*[11] makes it clear that there may in some cases be 'overlapping rules' in both district plans and regional plans, but that the Council's ability to make rules is dependent on those rules falling within its functions.

42. To the extent that the matter of discretion relates to the Council's functions under section 30(1)(d)(v), then we consider that there is no jurisdictional issue with its inclusion, as section 68 only restricts rules relating to the Council's functions under section 30(1)(a) or 30(1)(b). This will depend on the Hearing Panel deciding that the effects of the use of the CMA for swing moorings extends to including the land-based effects for the purposes of section 30(1)(d)(v).

43. Potentially relevant to the assessment of whether the matter of discretion falls within the Council's section 30(1)(d) functions are the following factors:

    a. The fact that when activities in the CMA are being considered in a section 104 context, that all the effects, including those on land will be considered.[12]

    b. If classified as a discretionary activity, these effects would be able to be taken into account. In *Re Waiheke Marinas Ltd* the Environment Court confirmed there was a cross boundary integration issue between activities in the CMA and "its necessary relationship with the land".[13] However, in determining the

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[8] *Careys Bay Association Incorporated v Dunedin City Council* EnvC Dunedin C165/2002, 10 December 2002.

[9] *Careys Bay Association Incorporated v Dunedin City Council* EnvC Dunedin C165/2002, 10 December 2002, at [29].

[10] *Careys Bay Association Incorporated v Dunedin City Council* EnvC Dunedin C165/2002, 10 December 2002, at [36].

[11] *Canterbury Regional Council v Banks Peninsula District Council* [1995] 3 NZLR 189 (CA).

[12] *Re Canterbury Regional Council* A89/94 confirms that a regional council is not limited to considering the adverse effects of activities directly related to its functions when considering an application for resource consent.

[13] *Re Waiheke Marinas Limited* [2015] NZEnvC 218, at [88].

application for activities within the CMA, the Court clearly had regard to the effects associated with on-shore facilities, including traffic and amenity effects.

c. We are also aware of consenting decisions which explicitly address plan requirements detailing the need for on-shore facilities.[14] Although such decisions do not explicitly address the vires of these plan provisions.

d. Again, while not determinative we are aware of other regional coastal plans which seek to include matters of discretion addressing shore-based activities in restricted discretionary rules (for example, the Waikato Regional Coastal Plan).

e. While not directly considering the scope of section 30(1)(d)(v), as noted above, the Environment Court decision in *Auckland Yacht and Boating Association v Waikato Regional Council* did not suggest that a matter of control in relation to land-based effects was a reason for not imposing controlled activity status.

44. For completeness and in the event that the Hearing Panel does not consider that the land-based effects on parking and shore facilities, are an effect of the use of the CMA for swing moorings (and are instead related to the Council's functions under section 30(1)(a)), then we have also considered whether the matter of discretion forms part of the 'rule' for the purposes of section 68(1).

45. We are unaware of any case law that specifically addresses whether the references to a 'rule' within section 68 includes the matters of discretion specified in the rule.

46. A 'regional rule' is defined in the RMA as a rule made as part of a regional plan or proposed regional plan in accordance with section 68.[15]

47. Based on a literal interpretation, we consider that a matter of discretion for a restricted discretionary activity still forms part of the rule and therefore the matter of discretion would be captured by the prohibition in section 68(1) (but only to the extent that the Hearing Panel does not find that it falls within Council's functions under section 30(1)(d)).

48. The literal interpretation is based on the wording in section 77B of the RMA which refers to the duty of a local authority to specify "in the rule" the matters over which it has restricted its discretion in relation to the activity. Based on this interpretation, any matter within the rule (including the matters of discretion) which did not fall within section 68(1) would be ultra vires.

49. However, in the absence of case law addressing this particular point, even if the Hearing Panel does not consider that the matter of discretion relates to the Council's section 30(1)(d) functions, we consider that it is arguable, applying a purposive interpretation, that Rule C.1.2.8 (and in particular the matter of discretion 1) is not ultra vires:

a. A regional rule is defined as a rule made as part of a regional plan or proposed regional plan in accordance with section 68. There is nothing in section 68 to suggest that a matter of discretion within a rule is limited by section 68(1).

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[14] *Nelson Fisheries Ltd v Marlborough District Council* PT, Wellington, W098/95, 28 August 1995.

[15] RMA, s 43AAB.

b. The rule itself controls activities within the CMA. This clearly falls within the Council's functions under section 30(1)(d). The matter of discretion is not seeking to control land outside of the RMA.

c. The factors set out at paragraph 43(a) to (d) will also apply.

50. We note that even if the pRPFN contains a matter of discretion addressing some of the land-based effects associated with activities in the CMA, that the extent to which the Council is in fact able to impose conditions on coastal permits applied for under this rule for land-based matters will depend on the adverse effect and condition being directly connected to the activity occurring within the CMA.[15] This is not a matter we have considered in detail in considering the vires of the rule, but we can provide further advice on this if required. It may go to the appropriateness of the proposed rule, bearing in mind the requirements of section 32 of the RMA.

51. We also note that given the function to control land is held by the relevant territorial authorities that to the extent the pRPFN seeks to include objectives and policies to help achieve integrated management in relation to these issues, that a district plan must not be inconsistent with a regional plan, so providing further guidance as to how this integrated management is to take place may alleviate the issues and allow for more co-ordination as to how these effects could be managed.

Extent of Council functions in relation to the regional plan

52. We understand that Policy D.2.9 is intended to apply to activities in the CMA, and also freshwater bodies and so the same questions arise in the context of regional plans (as opposed specifically to regional coastal plans) in relation to the extent to which this policy might be ultra vires.

53. In relation to freshwater bodies, we note that activities on the surface of freshwater bodies are within the control of territorial authorities. To the extent that an activity relating to freshwater comes within the functions of a regional council, we consider that for the control of any land-based effects the position would be the same as for the CMA, and that a regional plan can include objectives and policies and other methods (but not rules) where necessary to achieve integrated management of resources.

54. Section 65 (which relates to the preparation of regional plans) states that a regional council may prepare a regional plan for the whole or part of its region for any function specified in section 30(1)(c), (ca), (e), (f), (fa), (fb), (g) or (ga).

55. While we have not been able to locate any case law specifically addressing the limits expressed in section 65(1) and whether objectives and policies can be included in a regional plan (as opposed to a regional coastal plan) which address the integrated management of resources, we do not consider that section 65(1) prohibits a Council from including objectives and policies in its regional plan that relate to its other section 30 functions. This is because:

a. Sections 63 and 66 of the RMA require regional plans to be prepared in accordance with all of the Council's functions under section 30 of the RMA. If Parliament had intended that regional plans could not include objectives and policies in regional plans in relation to its integrated management functions then these sections would have reflected this.

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[15] Section 108AA requires that a condition can only be imposed if it is directly connected to either an adverse effect of the activity on the environment, or an applicable regional rule.

b. Further, if regional plans were limited to only addressing the functions specified in section 65(1), there would have been no need for section 68(1) to limit the Council's rule making powers in relation to its section 30(1)(a) and 30(1)(b) functions.

c. While not directly on this point, we do note that the High Court in *Albany North Landowners v Auckland Council* summarised the requirements for the adoption of the Auckland Unitary Plan as follows:[17]

> The AUP was to meet the requirements of the following planning instruments:
>
> (a) A regional policy statement (RPS): an RPS achieves the purposes of the RMA by providing an overview of the resource management issues of the region and policies and methods to achieve integrated management of the natural and physical resources of the whole region;
>
> (b) A regional plan: the purpose of a regional plan is to assist the Council to carry out its region-wide functions, including:
>
> (i) the establishment, implementation, and review of objectives, policies, and methods to achieve integrated management of the natural and physical resources of the region; and
>
> (ii) Preparation of objectives and policies in relation to any actual or potential effects of the use, development or protection of land which are of regional significance. …
>
> (Footnotes omitted)

56. We note that other statutory directions, such as the requirement to give effect to the National Policy Statement for Freshwater Management 2014, also specifically require regional councils to improve integrated management of fresh water and the use and development of land in whole catchments, including the interactions between fresh water, land, associated ecosystems and the coastal environment.[18]

57. From the correspondence with you, we are not aware of any rules with the pRPFN which purport to control land or address land-based effects as part of implementing Policy D.2.9 so have not addressed the ultra vires issues of any rules in the pRPFN in this context.

ONLs and ONFs

58. We also understand that some controlled and restricted discretionary rules in the pRPFN require the consideration of effects on outstanding natural features and outstanding natural character without qualifying whether they are on the land or in the water. You have asked whether a regional plan and/or regional coastal plan can include rules that require the consideration of the effects of an activity on ONF and ONL areas mapped on land (e.g. outside the coastal marine area and freshwater bodies), or is the consideration of these effects limited to ONFs and ONLs mapped in the coastal marine area and freshwater bodies?

59. From your question we do not understand the Council to be seeking to regulate activities on land in relation to the protection of ONLs and ONFs, but rather the Council is questioning whether it is entitled to include rules that require consideration of the effects of an activity (occurring with the CMA or a freshwater body) on an ONF

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[17] *Albany North Landowners v Auckland Council* [2016] NZHC 138 at [11].

[18] Objective C1 of the National Policy Statement for Freshwater Management 2014.

and ONL on areas mapped on land. We also understand that the Council is not seeking to separately map ONLs and ONFs that occur on the land.

Effects of activities in the CMA

60. As set out above, section 68 of the RMA enables a regional council to include rules within a regional plan for any of its functions under section 30, other than section 30(1)(a), or section 30(1)(b).

61. Activities within the CMA fall within the Council's functions under section 30(1)(d). Clearly the Council may include rules in the pRPFN regulating matters that fall within this function.

62. As set out above, section 30(1)(d)(v) provides the Council with the function of controlling the actual or potential effects of the use, development, or protection of land within the CMA. Section 30(1)(d)(vii) provides that it is a function of a regional council to control activities in relation to the surface of water in the CMA.

63. To the extent that the activities regulated by the Council under section 30(1)(d) will have effects on ONLs and ONFs beyond the CMA, we consider that there is no jurisdictional bar on the Council including matters of discretion or matters of control in relation to these matters (despite the fact that the Council does not have a function enabling it to control land uses outside of the CMA for the purposes of managing effects on ONFs and ONLs).

64. While not determinative of the extent of the Council's functions, we do consider it relevant that in making a rule regulating an activity within the Council's functions under section 30(1)(d), section 68(3) requires the Council to have regard to the actual or potential effect on the environment of activities, including in particular any adverse effect. We do not consider section 68(3) to place any jurisdictional limit on only those effects that relate to or occur on land within the regional council's functions (i.e. land below mean high water springs).

65. While we consider that there is no jurisdictional limit on a regional coastal plan including a matter of discretion or matter of control relating to effects on ONLs or ONFs outside of the CMA, this will go to the appropriateness of any such rule. In terms of case law, there is limited case law specifically considering this issue:

    a. We note that in the Environment Court decision in *Moturoa Island Limited v Northland Regional Council*[19] that the Environment Court did not make any adverse comment about an objective in the regional coastal plan which provided for the protection of ONF/ONL identified in district council assessments. While this case was not specifically considering the ability to include matters of control or discretion, we consider that it still supports this interpretation. We note that the mapping of land-based ONLs and ONF will not fall within the Council's functions.

    b. As noted above, in *Auckland Yacht and Boating Association v Waikato Regional Council*[20] the Environment Court considered whether it should impose controlled activity status or discretionary activity status for certain activities relating to existing marine farms. One of the matters of control was in relation to the nature of disturbance to natural character of the land. In the end, the Court held that discretionary status would be more appropriate,

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[19] *Moturoa Island Limited v Northland Regional Council* [2013] NZEnvC 227

[20] *Auckland Yacht and Boating Association v Waikato Regional Council* EnvC Auckland A211/2002, 31 October 2002.

however, there is no suggestion in this case, that a Council could not consider the land-based effects of an activity occurring within the CMA.

66. On the basis of the above, we consider that it is open to the Council to include matters of control and matters of discretion for rules regulating activities in the CMA that require consideration of effects on land-based ONLs and ONFs.

Effects of activities in freshwater bodies

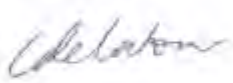
67. In relation to freshwater bodies, as noted above, activities on the surface of freshwater bodies are within the functions of territorial authorities. Accordingly, any rule which sought to control the surface of water bodies and thereby require consideration of the effects of activities on the surface of waterbodies on land-based ONLs and ONFs would fall outside of the functions of the Council and is at risk of being ultra vires.

68. However, to the extent that any of the activities that the Council regulates within its section 30 functions directly affect land based ONLs or ONFs then we do not consider that rules with the pRPFN need to make a distinction between those ONLs and ONFs that are land-based and those that are not.

Conclusion

69. We trust that the above advice is of assistance. If you have any questions or wish to discuss, then please do contact us.

Yours faithfully
Wynn Williams



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LFD-442371-3-24-V1

Legal advice received on the validity of managing land-based effects through performance standards in permitted activity rules.

WYNNWILLIAMS
LAWYERS

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MEMORANDUM

Date: 1 October 2018

To: **Jon Trewin, Ben Lee**

From: **Lucy de Latour**

MANAGEMENT OF LAND-BASED EFFECTS - PERMITTED ACTIVITIES

1. We have previously provided advice to the Northland Regional Council (**Council**) (dated 23 August 2018) that concluded that the proposed Regional Plan for Northland (**pRPFN**) can include objectives and policies relating to managing the effects on land-based values and requiring the provision of land-based infrastructure for activities within the coastal marine area (**CMA**) where the objectives and policies relate to integrated management.

2. We also concluded that it is open to the Council to include matters of discretion in relation to rules falling within the Council's functions under section 30(1)(d) which seek to address the 'on-land' effects of these activities, in particular circumstances.

3. A question has arisen regarding permitted activities in this context. You have asked us to consider whether the situation is the same for permitted activity rules as it is for controlled or restricted discretionary activities, more specifically whether a permitted activity rule can also include criteria relating to land-based effects.

Executive summary

4. The Council is restricted from including rules in regional plans for the purpose of their functions under sections 30(1)(a) and (b), relating to integrated management and the use, development and protection of land of regional significance.

5. However, section 30(1)(d)(v) provides that a regional council has the function to control any actual or potential effects of the use, development or protection of land in the CMA.

6. If a permitted activity rule is addressing the actual or potential effects of the use of land within the CMA (bearing in mind that land in the CMA includes that which is covered by water), then it will be valid. We consider that rules that control activities in the CMA, but include criteria addressing both lighting and noise in the CMA and outside the CMA (provided the effect is associated with an activity in the CMA regulated by the relevant rule), will be valid. This is because such a rule clearly controls the effects of the use of land within the CMA, and is not attempting to control land outside of the functions of a regional council.

7. Any criteria within the permitted activity rule will need to meet the usual tests applicable to permitted activities (including that it is certain and capable of objective assessment).

Analysis

8. Section 87A of the RMA provides for classes of activities to be described in a plan. Permitted activities are provided for in section 87A(1), which states:

> If an activity is described ... as a permitted activity a resource consent is not required for the activity if it complies with the requirements, conditions, and permissions, if any, specified in the Act, regulations, plan or proposed plan.

9. As discussed in our previous advice, section 68 of the RMA provides the power for regional councils to make rules. This section provides that a regional council can include rules in a regional plan for the purpose of carrying out its functions under the RMA, except for those described in sections 30(1)(a) and (b).

10. Sections 30(1)(a) and (b) deal with achieving integrated management of the natural and physical resources of the region, and the management of effects of use, development or protection of land of regional significance, limiting the ability to make rules for the purpose of achieving these functions.

11. However, section 30(1)(d) provides for the control in respect of the coastal marine area of:

> (v) Any actual or potential effects of the use, development, or protection of land, including the avoidance or mitigation of natural hazards.

12. To the extent that the criteria for a permitted activity rule directly relates to the Council's function under section 30(1)(d)(v), we consider there is no vires issue, as the only restriction on making rules is in relation to the functions specified in sections 30(1)(a) and (b).

13. We understand that the Hearing Panel's question has arisen in relation to Rule C.1.8, which provides general conditions for all permitted coastal activities to comply with. This rule seeks to impose criteria on noise limits and lighting so as not to disturb activities that occur on adjacent land.

14. The definition of "land" in the RMA is broad, and includes land covered by water and the air space above land.[1] An activity using land in the CMA is likely to have other effects than those that only occur in the CMA itself. In our opinion, it is open for the pRPFN to include rules to control these effects under section 30(1)(d)(v), as it is the effects of the activity on adjacent land that are being regulated.

15. We consider that requiring a permitted activity to comply with the lighting conditions as specified in Rule C.1.8 is not attempting to control land outside of the CMA. Rather, these criteria directly relate to the effects of activities within the CMA, so that it would fit squarely within the function of the Council under section 30(1)(d)(v).

16. We also note the control of the emission of noise is a separate function of a regional council under s30(1)(d)(vi), so we consider there is no vires issue in relation to this point.

17. The Environment Court has previously accepted that the control of noise within the CMA is within the jurisdiction of the relevant regional council.[2] The Court in this case stated:[3]

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[1] RMA, s 2.

[2] *Careys Bay Association Incorporated v Dunedin City Council* EnvC Dunedin C165/2002, 10 December 2002, at [21].

> For current purposes it was accepted by all parties to this hearing that the Regional Council had the power to control emission of noise within the CMA particularly that produced by ships at berth.
>
> ...
>
> It is clear to us that the Regional Council have primary responsibility for the control of noise emission by ships. They have declined to exercise their powers to regulate such noise emission. Thus the residents group is seeking to achieve this result indirectly by controlling land based activities within the District.

18. There is no suggestion in this case that the control of the effects of noise created in the CMA stops at the boundary of the CMA, or that controlling the effects of this activity cannot consider adverse effects to adjacent land (as provided for by section 30(1)(d)(v)). It is considered that the same approach should be taken to lighting, as these effects are similar in that they are not constrained to the boundary of the CMA.

19. For completeness, we note that any permitted activity rules (including criteria for noise and lighting) will need to meet the legal tests for valid permitted activities (including that the rule is sufficiently certain and is capable of objective assessment). Please let us know if any further advice regarding these matters is required.

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[3] *Careys Bay Association Incorporated v Dunedin City Council* EnvC Dunedin C165/2002, 10 December 2002, at [20]-[21].

Legal advice received on the relationship between NZCPS and NPS ET in relation to regionally significant infrastructure.

WYNNWILLIAMS
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MEMORANDUM

Date: 18 October 2018

To: **Jon Trewin, Ben Lee**

From: **Lucy de Latour**

RELATIONSHIP BETWEEN NZCPS AND NPS-ET IN RELATION TO REGIONALLY SIGNIFICANT INFRASTRUCTURE

1. A question has arisen in relation to the proposed Regional Plan for Northland (**pRPFN**) and an apparent tension between national planning documents.

2. You have asked us to consider whether the New Zealand Coastal Policy Statement (**NZCPS**) policies which require avoidance of adverse effects need to be read strictly, both in the context of regionally significant infrastructure, and the application of the National Policy Statement for Electricity Transmission (**NPS-ET**) (specifically Policy 8) in relation to the national grid.

Executive summary

3. The pRPFN must give effect to all national planning documents and the RPS. "Give effect to" is a strong direction and requires positive implementation. The law is clear that policies (particularly those in the NZCPS) that are expressed in directive terms carry more weight than those that are not, and that "avoid" is a strong directive.

4. A recent decision of the High Court in *Royal Forest and Bird Protection Society of New Zealand v Bay of Plenty Regional Council*[1] has re-confirmed the requirement for regional plans to give effect to all policies in relevant higher order documents, requiring that any apparent tension is resolved if at all possible.

5. Policies 13 and 15 of the NZCPS are strong directions and require positive implementation. The Hearing Panel will need to satisfy itself that all instruments have been given effect to and that directive polices are not read down by broadly framed enabling policies.

6. While the High Court's decision in *Royal Forest and Bird Protection Society of New Zealand v Bay of Plenty Regional Council* did not specifically address the interplay between the NPS-ET and the NZCPS, the pRPFN must give effect to both by seeking to reconcile the different policies and by the Hearing Panel applying weight to the policies as it sees fit (however, care needs to be taken not to read-down or dilute directive policies).

7. In terms of other regionally significant infrastructure, it is clear that a contextual approach is not acceptable. The High Court has indicated that regionally significant

[1] *Royal Forest and Bird Protection Society of New Zealand Incorporated v Bay of Plenty Regional Council* [2017] NZHC 3080.

infrastructure should be provided for where it is appropriate, but in line with *King Salmon*[2] that not all locations in the CMA will be appropriate.

8. We have provided some guidance within the body of this memorandum on a potential approach that can be taken to reconciling the various tensions within the higher order documents that the pRPFN must give effect to.

9. Our detailed analysis follows.

Background

10. We understand this question has primarily arisen as a result of submissions made by Transpower to the Hearing Panel, along with some submissions by other infrastructure providers.

11. We understand Transpower's submissions to suggest that Policy 8 of the NPS-ET and some policies (particularly Policies 11, 13 and 15) of the NZCPS could be in conflict, and in this situation the NPS-ET policies should prevail.

12. Policy 8 of the NPS-ET provides:

> In rural environments, planning and development of the transmission system **should seek to avoid** adverse effects on outstanding natural landscapes, areas of high natural character and areas of high recreation value and amenity and existing sensitive activities.
>
> [emphasis added].

13. This policy sits alongside more enabling policies, such as Policy 2:

> In achieving the purpose of the Act, decision-makers must recognise and provide for the effective operation, maintenance, upgrading and development of the electricity transmission network.

14. The contrast between policies in the NZCPS occurs where the NZCPS policies provide a strict direction, such as Policy 15:

> To protect the natural features and natural landscapes (including seascapes) of the coastal environment from inappropriate subdivision, use, and development:
>
> (a) avoid adverse effects of activities on outstanding natural features and outstanding natural landscapes in the coastal environment

15. Although this policy in particular has been held to provide somewhat of an "environmental bottom line", there are other policies in the NZCPS that could be considered to support the position of Transpower in recognising the importance of the national grid.

For example, Policy 6 recognises that there are some activities that are required to be located in the CMA:

> 1. In relation to the coastal environment:
>
> (a) recognise that the provision of infrastructure, the supply and transport of energy including the generation and transmission of electricity, and the extraction of minerals are activities important to the social, economic and cultural well-being of people and communities;
>
> ...

---

[2] *Environmental Defence Society Incorporated v New Zealand King Salmon Company Limited* [2014] NZSC 38.

> 2. Additionally, in relation to the coastal marine area:
>
> ...
>
> (c) recognise that there are activities that have a functional need to be located in the coastal marine area, and provide for those activities in appropriate places;

Legal tests

16. Section 67(3) of the RMA requires that a regional plan "give effect to" any national policy statement, any New Zealand coastal policy statement, and any regional policy statement.

17. The Supreme Court in *EDS v King Salmon* considered the requirement to "give effect to" these documents. The Supreme Court confirmed that "give effect to" means "implement", and is a strong directive, creating a firm obligation on the part of those subject to it.[3] The Court recognised that:[4]

> A requirement to give effect to a policy which is framed in a specific and unqualified way may, in a practical sense, be more prescriptive than a requirement to give effect to a policy which is worded at a higher level of abstraction.

18. In the same case, the Supreme Court considered the interpretation of the word "avoid", particularly in relation to Policies 13 and 15 of the NZCPS. In this context, the Court considered that "avoid" has its ordinary meaning of "not allow" or "prevent the occurrence of".[5]

19. As the relevant NZCPS policies referred to "inappropriate" use, or providing for activities "where appropriate", the Court considered that what is inappropriate is to be assessed against the characteristics of the environment that policies 13 and 15 seek to preserve.[6] This recognised that given the importance of outstanding natural landscapes, the policies could be reconciled by the fact that if an activity was to have adverse effects on the outstanding natural landscape, it would not be an appropriate location for that activity.

20. In relation to the ways in which different policies are expressed, the Supreme Court stated:[7]

> Those expressed in more directive terms will carry greater weight than those expressed in less directive terms. Moreover, it may be that a policy is stated in such directive terms that the decision-maker has no option but to implement it.

21. This position emphasised the relevance of carefully considering how different policies are expressed in order to determine whether they truly "pull in different directions", or whether they can be reconciled.

22. In light of these relevant tests, it is necessary to consider how the NPS-ET (particularly Policy 8) can be given effect to along with the more directive policies of the NZCPS in relation to the national grid. In relation to other regionally significant

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[3] *Environmental Defence Society Incorporated v New Zealand King Salmon Company Limited* [2014] NZSC 38 at [77].
[4] *Environmental Defence Society Incorporated v New Zealand King Salmon Company Limited* [2014] NZSC 38 at [80].
[5] *Environmental Defence Society Incorporated v New Zealand King Salmon Company Limited* [2014] NZSC 38 at [96].
[6] *Environmental Defence Society Incorporated v New Zealand King Salmon Company Limited* [2014] NZSC 38 at [126].
[7] *Environmental Defence Society Incorporated v New Zealand King Salmon Company Limited* [2014] NZSC 38 at [129].

infrastructure, it is necessary to consider how the objectives and policies in the Regional Policy Statement for Northland (**RPS**) should be reconciled with the NZCPS.

Position in relation to national grid

23. The NPS-ET covers the electricity transmission network, which is defined as:

> ...part of the national grid of transmission lines and cables (aerial, underground and undersea, including the high-voltage direct current link)...

24. "National grid" is separately defined as:

> means the assets used or owned by Transpower NZ Limited.

25. This demonstrates that the application of the NPS-ET is limited, and will only cover infrastructure associated with the national grid. As a result, it is necessary to separately consider the national grid from other regionally significant infrastructure, which we address separately below.

26. We consider that, consistent with the approach to interpreting conflicting policies (as set out below), a policy is only able to prevail over another where there is no way of reconciling the two together. In this case, it is necessary to consider the particular provisions affected in order to determine whether there is any way in which the policies of the NPS-ET and the NZCPS can be read together.

27. The High Court decision in *Royal Forest and Bird Protection Society of New Zealand Inc v Bay of Plenty Regional Council* makes it clear that decision makers must seek to reconcile the various higher order directions in a manner consistent with the Supreme Court's approach in *King Salmon*.

28. This case concerned policies in the Bay of Plenty Regional Coastal Environment Plan that provided for regionally significant infrastructure to be located within the CMA. Relevant to this assessment, the High Court stated in *Royal Forest and Bird*:[8]

> While the requirement to avoid adverse effects on high value areas pursuant to policies 13 and 15 in the NZCPS is not contextual, the factual question, whether any activity seeking to locate or operate in a high value area will have an adverse effect, may be contextual.

29. We note that in this case the national grid infrastructure was addressed slightly differently from other regionally significant infrastructure on the basis of the NPS-ET. The High Court (when setting out the background to the matters at issue) stated:[9]

> There is an express exception for the national grid, which is provided for in the NPSET.

30. This demonstrates that the High Court has accepted in this case that the NPS-ET provides for the national grid separately to other infrastructure. However, we note that this point was not challenged in this case, and we consider the Hearing Panel should exercise caution in directly applying this approach given that the High Court did not hear argument on this point. The High Court decision does not suggest that you do not have to reconcile higher order documents and give effect to them all.

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[8] *Royal Forest and Bird Protection Society of New Zealand Incorporated v Bay of Plenty Regional Council* [2017] NZHC 3080 at [105].
[9] *Royal Forest and Bird Protection Society of New Zealand Incorporated v Bay of Plenty Regional Council* [2017] NZHC 3080 at [13].

31. While the weight to be given to the different policy statements is ultimately a question for the Hearing Panel in the particular context, the following factors should be taken into account in terms of applying Policy 8 in the NPS-ET, as against the relevant policies in the NZCPS.

32. As set out above, Policy 8 of the NPS-ET applies to outstanding natural landscapes, areas of high natural character and areas of high recreation value and amenity. Policy 11 of the NZCPS deals with avoiding effects of activities on indigenous biological diversity, which is a largely separate topic. This allows these two policies to operate independently of each other, and for decision-makers to give effect to both policies without needing to reconcile them.

33. As assessed above in relation to the legal tests, the Supreme Court has found that policies 13 and 15 of the NZCPS provide a strong directive, being "something in the nature of a bottom line." As the Supreme Court has made clear, "give effect to" is a strong direction requiring positive implementation. The more directive a policy, the greater weight should be afforded to it.

34. Although Policy 13 of the NZCPS and Policy 8 of the NPS-ET are expressed differently, the NPS-ET policy will also apply to areas of outstanding natural character (given that an area of outstanding natural character will we expect, as a matter of course, also be considered an area of high natural character). Whilst ultimately a matter for the decision makers, we consider that the policies could be read together as follows:

    a. adverse effects must be avoided on areas of outstanding natural character;

    b. adverse effects should be sought to be avoided on areas of high natural character; and

    c. significant effects on other areas of natural character must be avoided.

35. Policy 15 of the NZCPS requires that adverse effects are avoided on outstanding natural features and outstanding natural landscapes. Given that the NPS-ET does not provide for outstanding natural features, Policy 15 of the NZCPS will be more relevant in these areas. We note that the pRPFN does not provide policies in relation to outstanding natural landscapes, but that the operation of this NZCPS policy should be carefully considered alongside the NPS-ET (particularly given that outstanding natural landscapes are protected by the Northland Regional Policy Statement), in line with the approach set out below.

Position in relation to regionally significant infrastructure

36. Given that the NPS-ET applies only to the national grid, the situation is slightly different in relation to other regionally significant infrastructure in terms of the application of the NZCPS. As the NPS-ET does not apply, the apparent tension appears to be between the RPS and the NZCPS (similarly to the *Royal Forest and Bird* case).

37. Objective 3.7 of the RPS provides:

> Recognise and promote the benefits of regionally significant infrastructure, (a physical resource), which through its use of natural and physical resources can significantly enhance Northland's economic, cultural, environmental and social wellbeing.

38. This position has been reflected in the section 42A version of the pRPFN, with the inclusion of new policy F.0.6:

> Recognise the benefits of regionally significant infrastructure and renewable energy generation and enable their effective development, operation, maintenance, repairs, upgrading and removal.

39. In this instance, it appears as though the requirement to avoid adverse effects under the NZCPS (considering the relevant policies have been expressed as being so directive that they "provide something in the nature of a bottom line"[10]) will be important, and means that in the coastal environment, specific attention needs to be given to the manner in which adverse effects on natural character and landscapes are avoided.

40. The RPS and the pRPFN have to give effect to the NZCPS and the question therefore becomes how enabling policies should be reconciled with directive 'bottom line' policies.

41. The *EDS v King Salmon* approach to this issue was as follows:[11]

> In the present case, we do not see any insurmountable conflict between policy 8 [of the NZCPS] on the one hand and policies 13(1)(a) and 15(a) on the other. Policies 13(1)(a) and 15(a) provide protections against adverse effects of development in particular limited areas of the coastal region – areas of outstanding natural character, of outstanding natural features and of outstanding natural landscapes (which, as the use of the word "outstanding" indicates, will not be the norm). Policy 8 recognises the need for sufficient provision for salmon farming in areas suitable for salmon farming, but this is against the background that salmon farming cannot occur in one of the outstanding areas if it will have an adverse effect on the outstanding qualities of the area. So interpreted, the policies do not conflict.

42. While the NZCPS does contain some enabling policies in relation to infrastructure provision (e.g. Policies 6 and 10), the *Royal Forest and Bird* High Court decision has re-emphasised the fact that enabling policies cannot be used to read down or contextualise the requirement to give effect to directive policies.

43. In order to reconcile the requirements of the NZCPS with the enabling provisions of the RPS and pRPFN, a similar approach to that of the High Court in *Royal Forest and Bird* could be taken, determining that the NZCPS prevents development in some high value areas, but that regionally significant infrastructure should be enabled in other areas:[12]

> Read carefully, and following the *King Salmon* approach, they [the objectives in the RCEP] recognise that provision needs to be made for regionally significant infrastructure, but not in all locations in the coastal marine area.

44. We note that while the cases emphasised the need to give effect to directive policies, there are a number of ways that the Hearing Panel might do this (via the objectives, policies and rules themselves (including activity status)). If you have further questions about this, please let us know.

45. For completeness, we note that the High Court in *Royal Forest and Bird* remitted the decision back to the Environment Court for consideration, and the issue was settled

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[10] *Environmental Defence Society Incorporated v New Zealand King Salmon Company Limited* [2014] NZSC 38, at [132].
[11] *Environmental Defence Society Incorporated v New Zealand King Salmon Company Limited* [2014] NZSC 38, at [131].
[12] *Royal Forest and Bird Protection Society of New Zealand Incorporated v Bay of Plenty Regional Council* [2017] NZHC 3080 at [135].

by way of consent order (amending the provisions to relate more closely to the relevant policies, but not as much as Forest and Bird sought initially).[13]

46. In light of the above discussion, to assist the Hearing Panel, we have set out below the relevant approach to interpreting policies, particularly in circumstances where they appear to conflict.

Interpretation of conflicting policies

47. The RMA establishes a hierarchy of policy and planning documents, from national instruments to regional policy statements, and regional and district plans. This 'hierarchy' is to promote sustainable management and ensure integrated management of natural and physical resources at a national, regional and local level.

48. In the context of the pRPFN, this hierarchy is implemented by the requirement for the pRPFN to "give effect to" any NZCPS and national policy statement, and any regional policy statement.[14] "Give effect to" has been held to be a strong direction that creates a firm obligation on the part of those subject to it, and it effectively means "implement".[15]

49. Because the pRPFN must give effect to all of the relevant national policy statements and the regional policy statement, a difficulty may arise where these appear to 'compete' with each other. The Council cannot avoid giving effect to one national policy statement on the basis that it is giving effect to another national policy statement.[16]

50. In respect of a perceived conflict between different provisions of one policy statement, or a conflict between provisions of multiple policy statements, the approach discussed by the Supreme Court in *King Salmon* (and as recently endorsed by the High Court in *Royal Forest and Bird Protection Society of New Zealand Inc v Bay of Plenty Regional Council*), should be applied to try and resolve the tension, as follows:[17]

    a. This requires the decision-maker to first identify those provisions that are relevant, paying careful attention to the way in which they are expressed.

    b. Provisions expressed in more directive terms will carry greater weight than those expressed in less directive terms. A requirement to give effect to a higher order document will be more prescriptive if the document to be given effect to is framed in a specific and unqualified way, compared to a policy that is worded at a higher level of abstraction. It may be that a policy is stated in such directive terms that the decision-maker has no option but to implement it.

    c. While there may be instances where particular policies in policy statements "pull in different directions", this is likely to occur infrequently, given the way that various policies are expressed, and the conclusions that can be drawn from those differences in wording. It may be that an apparent conflict

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[13] *Royal Forest and Bird Protection Society of New Zealand Incorporated v Bay of Plenty Regional Council* [2018] NZEnvC 157.
[14] RMA, s 67(3).
[15] *Environmental Defence Society Incorporated v New Zealand King Salmon Company Limited* [2014] NZSC 38 at [77].
[16] *Royal Forest and Bird Protection Society of New Zealand Incorporated v Bay of Plenty Regional Council* [2017] NZHC 3080 at [74].
[17] *Royal Forest and Bird Protection Society of New Zealand Incorporated v Bay of Plenty Regional Council* [2017] NZHC 3080 at [76], following *Environmental Defence Society v NZ King Salmon* [2014] NZSC 38 at [129]-[130].

between particular policies will dissolve if close attention is paid to the way in which the policies are expressed.

d. If the tension cannot be resolved, then recourse should be made to the higher order planning documents to see if the tension is more apparent than real.

51. Only if the conflict remains after this analysis has been undertaken is there any justification for reaching a determination which has one policy prevailing over another. The area of conflict should be kept as narrow as possible. The necessary analysis should be undertaken on the basis of the relevant policy statements, albeit informed by Part 2 of the RMA.

Wynn Williams

KTD-442371-3-40-V2:KTD

Appendix 3: Example erosion control plan

Erosion Control Plan

For Ilse Corkery

Farm location	
Farm type	**Lifestyle**
Farm size	**3.9 ha**
Soil types	**Marua clay loam (hill variant)**
Water supply	**Stream (not reticulated)**

This plan has been developed to assist the management of land practices so that they are sustainable ecologically and economically, to reduce the negative impacts on water quality. Please note, these proposed works are not compulsory.

Date: September 2018

Land Management Advisor: John Ballinger

This plan has been peer reviewed by Duncan Kervell, a member of the Northland Regional Council land management team.

Plan objective and context

This property is a 3.9 hectare lifestyle block located on steep hill country in the Whangārei Harbour catchment. This scenic property has harbour and valley views and a nice gravelly stream with good riparian cover. Unfortunately, in addition to providing good views, the steep contour and soil type have also resulted in several active slips that need to be managed.

The Whangārei Harbour catchment has been identified as a priority catchment for water quality management by Northland Regional Council's Waiora Northland Water programme. Consequently, under the Whangārei Harbour Catchment Plan and proposed Regional Plan, pastoral land use on high sediment yielding land (as defined by sediment modelling) requires an **Erosion Control Plan** from the 1st January 2025, to target active gully, earthflow and landslide erosion.

1. Property owner details

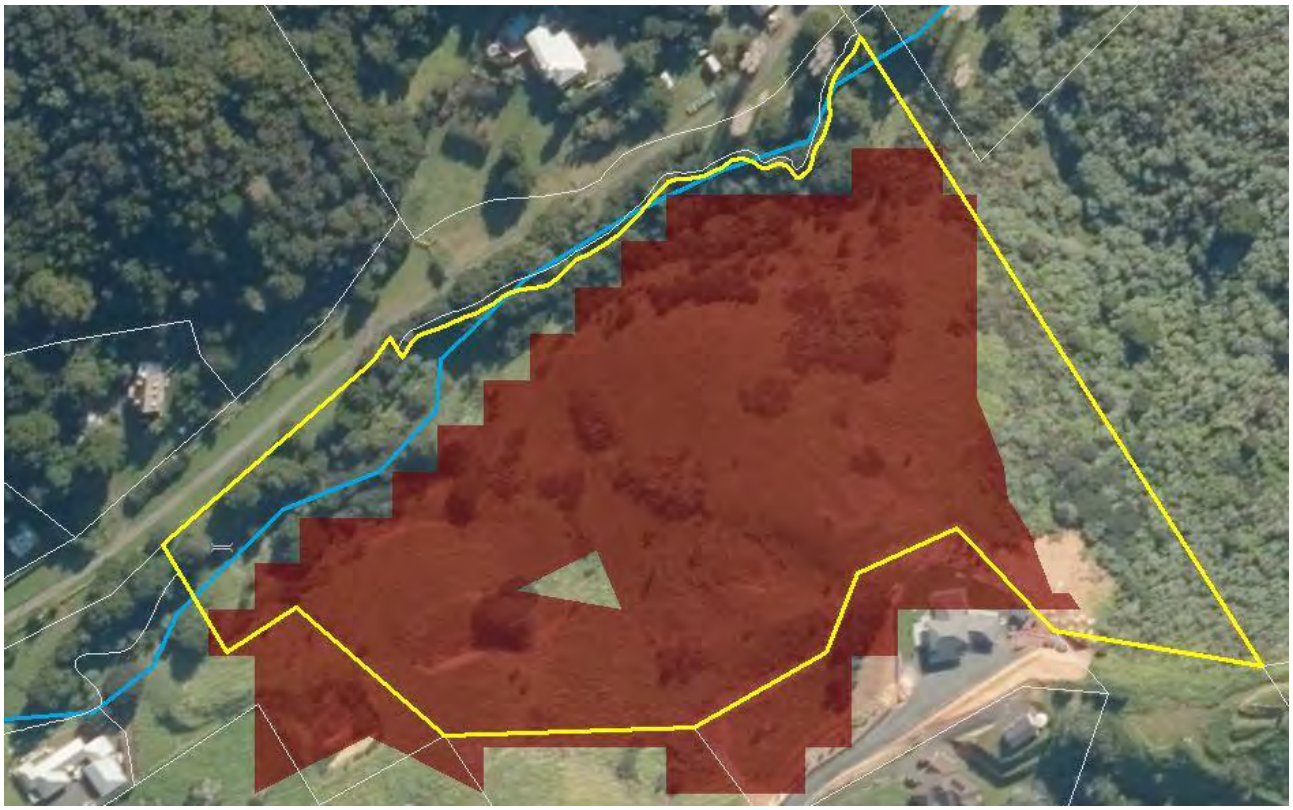
Name	**Contact details**	
	Postal address:	Email:
	Property details	
	Physical address:	Legal description:

2. Qualifications and contact details of report author

Name	**Contact details**	
John Ballinger	Physical address: Northland Regional Council, 36 Water Street, Whangārei 0148	
	Qualifications	
	2011 - MSc Physical Geography, Victoria University, Wellington 2009 - BSc Environmental Studies and Geography, Victoria University, Wellington	

3. Identification of land mapped as High Sediment Yielding Land within the property

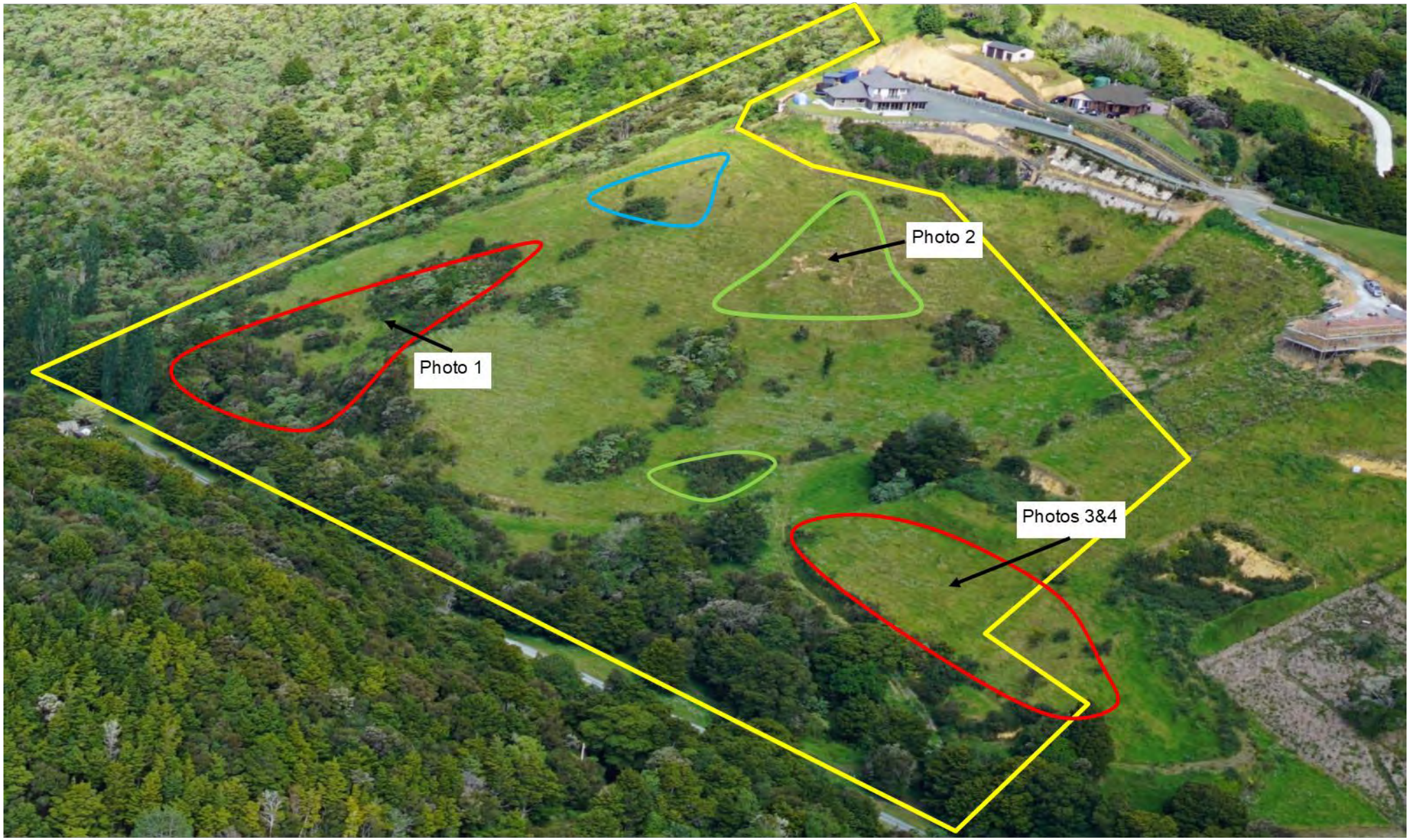
Nearly the entire property is mapped as ‘high sediment yielding land (see brown area in image below). The ‘high sediment yielding land’ layer is derived from SedNetNZ modelling. SedNetNZ is a spatially distributed, time-averaged model that routes sediment through the river network using a sediment budgeting approach. It is based on a relatively simple physical representation of hillslope and channel processes that contribute to each stream link in a river network, accounting for losses in water bodies (reservoirs, lakes), and deposition on floodplains and in the channel. SedNetNZ simulates the contribution of sheet and rill erosion, landslides, earthflows, gullies, and bank erosion, processes that collectively account for the majority of erosion and sediment generation in the New Zealand landscape. It also accounts for floodplain deposition.



4. Identification of gully, landslide and earthflow erosion within areas of the property

Due to the steep slopes on the property your soil type (Marua clay loam) is prone to **landslide erosion**, particularly during dry summers followed by high intensity rainfall events. Slips occur when clay that has washed down through the soil profile creates a slip plane. Water flowing down through the cracks removes support from the adjoining slopes, which then slump. Similarly, slips can also appear where farm tracks have cut into the toe of a slope removing its support.

With varying degrees of severity, these processes are evident in **five places** on the property (see aerial photo on following page). In addition to the slips, the entire farm is covered by terracettes (commonly called sheep tracks), which have been created by the mass movement of soil downslope through small scale soil slumping. The terracettes are exacerbated by cattle movement across the slope.



Aerial photograph showing approximate area of slips requiring planting. Priority A is coloured red, Priority B green, and Priority C blue. Prioritisation is based on the severity of the slip, how active it is, distance to the stream, and potential impact on infrastructure and site access. The Yellow line indicates the approximate property boundary.

5. Identification of measures to reduce gully, landslide and earthflow erosion and incidental sediment loss from High Sediment Yielding Land

5.1 Targeted poplar planting

A solution to control slipping is by planting poplars at 10-15m spaces across hillsides to help hold the soil together. Increase the planting density (e.g. 5-10m) on active slips. If possible, permanently exclude stock from actively eroding areas, but if this isn't practical, only graze light stock for short periods. Fencing to exclude stock from this planting for at least 2-3 years will support the long term stabilisation of the slips and ensure the survival of your poplars. However, if you don't want to fence it off, you could use tree protector sleeves on the trunks which will provide limited protection against cattle rubbing.

Poplars are extremely efficient at stabilising erosion because they establish large root systems very quickly. However, poplars need to have stock excluded for 2-3 years for the roots to become established. Temporary fencing is recommended for that period and could be removed later so stock can graze beneath the trees. Be aware that even modern varieties of poplars and willows need to be maintained so they don't become too tall and top heavy. Prune to create good form and plan in succession planting in 25 years once the trees are mature.

As part of efforts to reduce hillslope erosion in Northland, the council is offering subsidised poplar and willow poles to properties within areas of high erosion risk for soil conservation purposes. Numbers are limited, so please contact your Land Management Advisor John Ballinger if interested. A planting plan and best practice, handling and storage guide for soil conservation trees within Northland has been attached at the back of this document for future reference.

Given the high erosion risk and marginal pasture growth in some parts of the farm, you should consider retiring some areas and plant them with native or exotic trees. For your information, I have enclosed the booklet "Trees for the land – growing trees in Northland for protection, production and pleasure". Furthermore, if considering planting with native trees, then refer to the enclosed document that describes the vegetation of the closest Significant Natural Area which is the Taihu/Kohinui Stream Bush site - Q07/005[1]. By choosing native plants that grow at this site you will be planting the most ecologically appropriate vegetation for this area.

Table 1 estimates the number of poplars you require if you plant the identified slips at 10m spacing. The table also includes the number of poles required if you open plant the reminder of the property (outside of the slips) with poplars at 15m spacing.

Table 1: Number of poplars required to stabilise the site

Priority slips for planting	Approx. area (ha)	Number of poplar poles
A (x2 slips @10m spacing)	0.41	41
B (x2 slips @10m spacing)	0.18	18
C (x1 slip @10m spacing	0.09	9
Open planting (outside of active slips @15m spacing)	1.64	109
Total	**2.32**	**68 (on slips) + 109 (open planting) = 177**

[1] Department of Conservation (2005). Natural areas of Whangaruru Ecological District: Reconnaissance Survey Report for the Protected Natural Areas Programme.

This slip is a high priority for planting because the toe of the slip is being actively eroded by the stream. I recommend planting with poplars or other trees with large root networks to help stabilise the soil.

This slip has the most recent evidence of movement (note large hole in slip on right photo). When planting poplars, be sure to plant one inside the hole.

While reasonably stable, if this slope fails access will be blocked to the neighbouring property. Note that trees must be protected from stock browsing as evidenced by the dead poles that have been planted previously.

5.2 Excluding livestock from the stream

The property boundary is mostly unfenced, resulting in 'wild' cattle entering the property from the regenerating bush block to the north. The new owners have expressed a desire to graze the property with light animals (light beef breeds and sheep or goats), and plan to prioritise boundary fencing.

Keeping stock out of waterbodies ensures stock stay safe and waterbodies stay healthy. Stock in waterbodies deposit dung and urine which increases nutrient and bacteria levels in the water. Cattle accessing the water and wallowing in it causes erosion and disturbance of stream banks and beds. Stock exclusion is one of the best things you can do to improve water quality.

Sediment, faecal bacteria and phosphorus can enter waterbodies by overland flow. The use of riparian setbacks and planting both reduces overland flow of nutrients and sediment, and provides shade and habitat for aquatic life.

Wetlands and areas of native vegetation are important natural filters and habitat for plants and animals. Protecting these areas from stock access and weed growth can have significant benefits.

This streams proximity to the coast means that it should have a high biodiversity of fish life, although this is compromised somewhat by a downstream culvert that restricts fish passage. However, this culvert has been identified for remediation within the Whangārei Harbour Catchment Plan.

The following table and attached map lists the recommended fence location to improve water quality. Approximate fence length is shown on the attached map. Bear in mind that the actual 'on the ground' measurement may be greater than this due to the topography, or where the fence is actually positioned.

Table 2: Approximate fence lengths (m):

Fence priority	Fence type	Length (m)
Priority A	8 wire post and batten @ 5m spacing	309
Total		309

Once the property boundary is secure, fencing this stream will keep cattle from defecating in the water and help to maintain stream bank integrity. This will reduce soil, bacteria and nutrient losses to water. You might also consider a programme of weed control and riparian planting to further enhance water quality and biodiversity benefits.

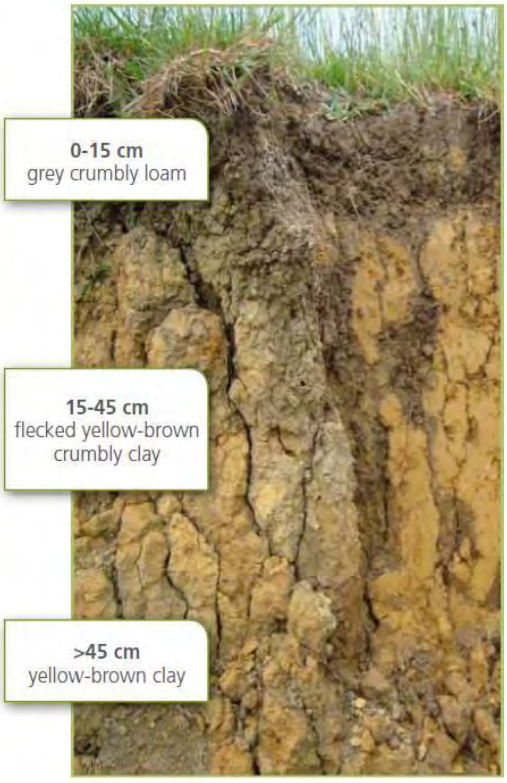
Stock exclusion rules and fencing setback distance

- There is currently no requirement to exclude livestock from the stream under NRC's Proposed Regional Plan due to the entire property being classified as hill country. However, by undertaking voluntary stock exclusion from waterbodies there will be significant benefits to water quality, livestock health and local biodiversity. Furthermore, this plan is still going through the Resource Management Act consultation process and could change when it becomes operative.
- If you exclude the livestock from the stream remember to budget for an alternative stock drinking water supply, which is typically reticulated.
- The aim of a fencing setback is to slow runoff to ensure as much harmful bacteria, nutrients and sediment as possible are filtered out before they enter the waterbody. A wider setback is needed adjacent to steeper slopes and heavier soils, as these generate fast flowing runoff. I recommend positioning the fence on the overgrown farm track at the base of the hill (see attached map)
- If you are going to plant the setback, focus on the northern and western banks to provide good summer shade. Reducing sunlight reduces weed growth and keeps water cool. This helps waterbodies remain well-oxygenated for fish and insects.

5.3 Protecting your soil resource

Northland's climate, topography, historic vegetation and complex geology have combined to form a very complex pattern of soils across the region. Knowing the capabilities and limitations of your soils is the key to sustainable production in Northland, therefore we have endeavoured to provide some basic information on your soils below.

The soil type found on most of the farm is the hill variant of **Marua clay loam (MRH)**. This soil has formed on hill country along Northland's east coast. The basement rock is greywacke, a generic name for a hard, compacted mix of sandstone and siltstone. As well as being prone to landslides after heavy rainfall, Marua clay pugs easily when wet, sealing soil surfaces.



Typical Marua clay soil profile

The Land Use Capability classification lists our most versatile soils as LUC 1 with our least versatile soils classed as LUC 8. Your soil's classification as **LUC 6e9** means its only suitable for pastoral or forestry land, with the 'e' denoting the dominant physical limitation being erosion. The '9' is the LUC Unit which simply groups land with similar potentials and management needs together.

Further information on the characteristics of your soil, including their issues and management strategies, can be found in the enclosed soil factsheet.

Increasing limitations to use ↓

LUC Class	Arable cropping suitability†	Pastoral grazing suitability	Production forestry suitability	General suitability
1	High ↓	High ↓	High ↓	Multiple use land
2				
3				
4	Low			
5	Unsuitable	Low	Low	Pastoral or forestry land
6				
7				
8		Unsuitable	Unsuitable	Conservation land

Decreasing versatility of use ↓

Increasing limitations to use and decreasing versatility of use from LUC Class 1 to LUC Class 8. The four subclass limitations are 'e' erodibility; 'w' wetness; 's' soil; and 'c' climate.

Source: Lynn IH, Manderson AK, Page MJ, Harmsworth GR, Eyles GO, Douglas GB, Mackay AD, Newsome PJF 2009. Land Use Capability Survey Handbook – a New Zealand handbook for the classification of land use 3rd ed. Hamilton, AgResearch; Lincoln, Landcare Research; Lower Hutt, GNS Science. 163p.

If you plan on grazing the property, I recommend being conservative in your stocking density. Based on the properties LUC 6e9, this land is capable of carrying 11 to 15 stock units per hectare[2]. By excluding livestock from the stream and some of the worst slips, you have approximately **2 hectares of grazing** land giving you between **22 to 30 stock units**.

You mentioned a desire to graze light beef cattle and/or sheep or goats. The following tables list the average weight and equivalent Livestock Units for sheep, goats and beef cattle[3]. Please note that one livestock unit requires approximately 520 kg good-quality pasture per year.

Sheep	**Weight at mating (kg)**	**Production Units**	**Livestock Units**
Ewe (lambs weaned)	45	90%	0.85
Ewe (lambs weaned)	55	100%	1.00
Ewe (lambs weaned)	65	130%	1.25
Hogget (pre-winter weight)	30	Slow	0.70
Hogget (pre-winter weight)	40	Medium growth-rate	1.00
Hogget (pre-winter weight)	50	Fast growth-rate	1.20
Ram	75	-	0.80

Goats (dairy)	**Weight (kg)**	**Milk yield (litres)**	**Livestock Units**
Does (grass only)	50-60	550	2.0
Does (browsing)	55	350	1.5
Goats (angoras)		**Mohair (kg)**	
Does	40	2-2.5	1.0
Buck	50	3.5	1.0
Goats (cashmere)		**Cashmere (g)**	
Does	25-35	Feral 30	0.7
Buck	30-60	Farmed 60	0.7

Beef cattle	**Weight Breeding (kg)**	**Calves Weaned**	**Livestock Units**
Cow	340-400	68%	3.70
Cow	400	83%	4.40
Cow	450	88%	5.30
Cow	500	90%	6.30
Weaners	135-270	—	3.50
Heifers, steers, bulls	200-400	Slow growing	3.70
Heifers, steers, bulls	200-465	Rapid growing	4.60
Heifers, steers, bulls	350-500	Rapid growing	4.70
Heifers, steers, bulls	600		6.00

[2] Cathcart, B (2017). Review of carrying capacities of Northland Land Use Capability units. Unpublished. AgFirst Northland.

[3] Ruralfind (2013) Livestock units. http://www.ruralfind.co.nz/about/rural-data-information/livestock-units/

6. A plan based on aerial imagery showing items (iii) to (v) above at a scale of 1:10,000 or less.

Aerial photograph showing approximate area of slips (coloured circles) requiring planting. Priority A is coloured red, Priority B green, and Priority C blue.

Appendix 1. Good practice guide to improve water quality

Addressing the management areas listed below will reduce the amount of contamination reaching our waterbodies whilst also benefitting farm production.

Livestock and water management:

- The priority is to **exclude livestock from waterbodies** by fencing and having trough water reticulated around the farm. There are not only environmental benefits from this practice but also health and production benefits for livestock due to providing better quality drinking water and use of pasture. Fenced streams and wet areas improve the ability to sub-divide and back fence.
- **Providing alternative water** in troughs reduces the desirability of riparian areas to cattle, so even when streams are not fenced, cattle do not access these areas as much. Trough water reduces the risk of animal diseases (e.g. liver fluke, leptospirosis, foot rot and giardia) by limiting access to water-born microbes. When cattle only have access to unpalatable water, their intake decreases, along with intake of dry matter, which has associated production losses. Shading water supplies improves water quality by reducing the temperature and likelihood of algal growth.
- If financial and time constraints initially restrict your ability to fence off waterbodies and have water reticulated, there are interim steps that can be undertaken. Selecting specific parts of a stream and constructing hard standing platforms where livestock can easily access water but do not pug the bank or foul the water, are steps in the right direction. Then when money and time permit, fence off the rest of the waterbody except for these access sites.
- **Provide and/or maintain trees** for stock shade and shelter as there are known production benefits when animals are not exposed to heat stress and stock generally prefer natural shade from trees over artificial shade. 25ºC is the trigger temperature for inducing heat stress in ruminants, and dark coloured, larger cows are affected more easily. Deciduous trees such as poplars and non-weedy willow varieties can be used for shade and fodder in summer, while allowing sunlight onto pasture in winter. If planting trees for shade, think about how many are required and where they are best planted. If possible, plant shade trees away from waterways, so any bare soil or effluent generated from stock congregating underneath is not washed into the waterway when it rains.

Soil and pasture management:

- Reduce and slow the rate of runoff into water by having good **pasture cover**, especially going into the wet season as this is when runoff is most considerable. As the grass shortage coincides with saturated soil levels, particular care and planning is needed. Options include decreasing livestock numbers and heavy classes of livestock, increasing rotation length and/or constructing stand off areas.
- Trees also act as **erosion control**, keeping soil in the paddock where it belongs rather than being washed away downstream. Poplars and willows are ideal for helping control soil erosion as they have extensive root systems, grow quickly and can be easily grown from poles. They do require maintenance and if planting in paddocks where cattle will be grazing they should ideally be fenced off for the first few years of establishment. If using them in sheep paddocks, a plastic sleeve should be sufficient to protect the stem.

Sediment and nutrient management:

- Create or take care of existing **wetlands** and native vegetation as they help to trap sediment and filter nutrients. Wetlands also provide habitat for native animal species. Fenced off, these areas provide an effective filtering service while also reducing the possibility of animals or vehicles getting stuck.
- **Buffer zones** of grass and vegetation along the water's edge help to reduce and slow contamination entering water. If planting riparian margins of drains within fence lines, leave the southern side clear of tall species to allow digger access for drain clearance if necessary.

- Construct and maintain **sediment traps** in runoff areas to interrupt surface flow before it enters waterbodies. Sediment traps need only be areas where water can pond with a hard rock base, then when the traps approach full capacity the sediment can be cleared with a shovel, tractor or digger bucket and re-applied to pasture as an alternate fertiliser.
- On farm races and tracks, create speed bumps or tail-offs that stop water scouring out the road and directly entering waterbodies. Capture the runoff in sediment traps or have it entering the paddock.

Management of fertiliser, irrigation, and chemical use:

- **Avoid direct application** to waterways and **saturated soil** and do not apply when heavy rain is predicted.
- Apply fertiliser when there is likely to be the most **plant uptake**, therefore getting the best use of the fertiliser.
- Ideally, **split dressings** or decrease the quantity applied to achieve better uptake and less wastage. Nutrient budgeting, soil testing and possible foliar testing may be used as an indicator to determine what action is needed.
- Do not use contaminated spray containers to mix, empty or fill in waterways.
- Spot spraying rather than broad or aerial spraying is less harmful with consideration to spray drift and creating bare earth.
- Remember to dispose of empty chemical containers according to NRC hazardous waste rules (http://www.nrc.govt.nz/Environment/Farm-Management/Agrichemical-collection/) or Agrecovery conditions (see: http://www.agrecovery.co.nz/containers/).

Fencing of flood-prone areas:

- Factor into your fence design some 'blow-out' or sacrifice areas to take the strain off the rest of the fence.
- Put the wires on the downstream side of the posts so the staples pop out rather than break the wire.
- Use un-barbed staples so they pop out more easily.
- Use the minimum number of wires that will contain your stock.
- Keep the bottom wire as high as possible to reduce flood damage and consider setting your posts deeper into the ground.
- Think about putting your fence further out from the stream, especially on erosion-prone outside bends.

Planting:

- Remove weeds in areas to be planted before you begin to plant; spot spray patches rather than blanket spraying to avoid bare patches that weeds can invade.
- Plant reasonably close together to avoid weed infestations and use larger plants if possible to avoid them being overtaken by grass & weeds.
- Release your plants regularly (at least twice a year) in the first couple of years, until they are tall enough to out-compete weeds. Using stakes (e.g. bamboo stakes dipped in white acrylic paint) to mark the position of seedlings helps you find them later.
- Mulch around young plants if possible to retain moisture and reduce weeds; use weeds that have been pulled out to help mulch around trees.

Funding information:

- You may be eligible for some financial assistance to undertake some of the suggested works through the Northland Regional Council Environment Fund. For more information see http://www.nrc.govt.nz/Your-Council/Funding-and-awards/Environment-Fund/

Appendix 2. Best Practice Planting, Handling and Storing Guidelines for Poplar and Willow Plant Material for Northland Situations

Upon receipt of poles follow these best practice guidelines for best results. Plant material should be colour coded to identify the variety of clone. If not ask your land management advisor to confirm.

Timing

Poles are normally harvested from the nursery when dormant and planted on farms in winter when soil moisture levels are high. The Northland planting season runs from June through to mid-August. This is largely linked to the plants' dormancy period with poplar and willow getting away earlier in Northland due to our warmer temperatures. Poles can be planted later, but at the landowners risk.

Type of plant material used

Typically, the main stems or leaders are used for both poplar and willow. Side branches are discouraged and cut to waste. Material should be straight, well grown and have a suitable diameter or the resulting growth will be much less vigorous and will take a lot longer to grow into useful trees.

Transportation, general handling and planting are easier if the material is straight and clean - free of any side branching.

Poles from Northland Regional Council or specialist nurseries often have two-year wood at their base and one-year-old wood at the top with live buds. If these buds are damaged then new buds will burst through the younger softer bark more easily than through older, woodier bark. In general, the younger, thicker and fresher cut the pole, then the faster it will establish.

Storage and handling

- Plant all material ASAP or within 1-2 weeks of receipt during the months June – mid August
- If dry, wait for some reasonable winter rain as it's easier to plant when soils are wet.
- It is strongly recommended that poles are soaked prior to planting for a period of up to 1-2 weeks. If left longer poles will begin to develop roots that will be lost in planting.
- Store in a cool shady area away from direct sun and wind.
- Maintain moisture levels by soaking ends in fresh water creeks or dams.
- In the absence of fresh water for soaking, lie in long wet grass.
- If these are not available, store with ends in a trough.
- Where possible, avoid storing in stagnant water.
- Do not store in the presence of stock.

Planting – spacing guidelines

Siting and spacing of plant material depends on a number of factors including slope, type and severity of erosion being controlled as well as general landforms and topography. The number of available poles is also an important factor, with poplar poles becoming increasing hard to source due to the limited number of growers both locally and nationwide.
It's better to over plant an area if there is a good supply of poles and then thin out at a later date to the desired stocking level. Some losses should be expected, but should be no greater than 25% if all best practice steps are followed.

Poplar and willow 3m poles

- Open planting to prevent erosion on moderate hill slopes, use 10-20m spacing.
- On moderately unstable slopes 8-10m spacing.
- On particularly unstable or active eroding slopes 5-6m metres apart.

- Plant to a depth of **900-1000mm of the 3m length**. Poles should be firmly planted into soil with no gaps or air pockets and should not easily work free.
- **Choose the best site for each pole** – look for depressions and low spots, small channels where water flows or pools, as these are the spots where erosion is likely to occur and where poles will thrive.
- Make sure there is sufficient soil depth, planting into hard clay or rocks may prove difficult and unsuccessful!
- Avoid dry exposed windy ridges, spurs and upper slopes.
- Pair-planting permanent watercourses in valley bottoms - each tree offset from its pair, at 10 to 12m apart, where banks are slightly erodible; 5 to 6m metres where actively eroding.

Poplar and willow stakes and wand material (1m-2.5m)

- Plant stakes at 4-5 m spacing.
- In gullies/wet areas pair plant which allows the trees root systems to overlap across the gully. This helps prevent further down-cutting of the gully bottom and slumping of the sides and head. Pair-plant active gullies at 3 to 6 metres apart.
- Exclude stock from planted areas for at least 12– 8 months to allow time for root establishment. Cattle rubbing or scratching up against poles will cause root damage and the likely death of your pole. If possible, exclude stock altogether but if this isn't practical, install a temporary single hotwire with pig tail standards or only graze light stock for short periods.

Planting methods and techniques

Each method listed below has its merits given the particular planting environment on your farm. The most important thing to consider is to ensure the pole is planted the right way up! Your nursery will either supply the butt end of poles as 'blunt' or 'pointed'. For health and safety reasons, poles are best sharpened on site as points are a hazard when transporting, but do make planting easier.

1m stakes and wands to 2.5m light poles

Either push into soft soil to 50% of total length or in more difficult situations; create a pilot hole with a suitable implement. Heavy rubber mallets are also effective if the tops are suitably woody. Tap firmly to gain a good hold or bite in the soil.

3m 'cattle' poles

Y Bar or pole rammer

The 'Y Bar' AKA 'thumpers' or pole rammers are recommended. The 'Y Bar' is a double or single handled rammer similar to a warratah or fence post rammer. NRC has a limited number of these to lend out to assist with planting. These can also be manufactured and plans can be obtained from council.

- Establish a pilot hole slightly smaller than the pole being planted (e.g. 50-60mm for a 75mm butt end).
- Place pole in chosen location butt end down, insert pole into Y bar tube.
- Thump the pole until firm at an optimum depth of 1/3 of the total length of material (e.g.1m for 3m pole); a tape measure may prove handy.
- If necessary, ram topsoil area tight, but avoid damaging the bark.
- Trim off any damaged tops once depth is reached.
- If using a sleeve, insert over pole.

Digging and post hole borers

- Create planting holes to 1/3 of the total length of material (e.g.: 1m for 3m pole).
- Back fill and ram soil firm around pole, ensuring bark is not damaged.
- If using a sleeve, insert over pole.

Crowbar method or reinforcing rod

- Create pilot hole with long crowbar by thrusting into soil and work to suitable depth, repeating the process to achieve desired results.
- Insert the pole and back fill and ram soil firm around pole, ensuring bark is not damaged.
- If using a sleeve, insert over pole.

Tree protectors sleeves

Northland Regional Council stocks and recommends Dynex tree protector sleeves. These are 1.7m solid plastic sleeves that can be fitted before or after planting. While sleeves are expensive, there are alternatives such as drain coil split down one side, and cyclone fencing rolled into a guard. Some of the benefits of Dynex sleeves are that they:

- Rotate when rubbed by stock, thereby reducing damage from rubbing.
- Help prevent possum damage by making access more difficult.
- Provide protection from sheep, goats, and to a lesser extent horses.
- Easily tear down the side perforation for easy removal as pole grows.
- Act as a second skin reducing exposure of the pole and retaining valuable moisture
- Last for up to 5 years.
- Do not require additional fixing stapling top and bottom.

Follow-up

In late spring and early summer, Northland soils tend to dry out, contract and shrink around the trunk. Consequently, poles can loosen and work free damaging the newly established roots. Extreme care must be taken in re-ramming poles during this stage of growth, as most roots develop near the soil surface in the top 200mm. Sand or fine soil can be used to fill gaps and firm up the pole again.

Poles then should also be checked regularly from around three years old to ensure the sleeves are not causing strangulation.

Maintenance

Maintenance of your poplars is necessary to ensure tree health and form, and reduce the risk of unmanageable trees in the future.

- Form-pruning to a single dominant leader is recommended at years one to three (growth dependant) to improve the final tree form.
- Around year 5, prune the lower 2 whorls of branches and then prune off a of branches every year after to a height of 6m. Pruning this way will increase light levels for pasture growth and produce trees with straight form and good timber potential.
- Remove any large, steeply angled branches as early as possible as these are likely sites for splitting.
- Prune trees in autumn to minimise epicorms re-growing on the main trunk
- If a site has initially been over planted, trees should be thinned at around 10 years (growth dependent) once root structures have expanded.
- Sleeves should split in years three to six. Remove sleeve with a sharp knife if it doesn't perforate on its own accord.

Further information

The New Zealand Poplar and Willow Research trust has produced a series of tutorial videos and guidelines explaining appropriate planting and management techniques. These videos are extremely useful and are highly recommended. Follow the link below to view: http://www.poplarandwillow.org.nz/library/filter/videos.

Appendix 4: Legal advice – S12(1)

MEMORANDUM

Date: 29 October 2018

To: **Ben Lee**

From: **Lucy de Latour, Kate Dickson**

APPLICATION OF SECTION 12(1) TO EXISTING STRUCTURES

1. There are several provisions in the proposed Regional Plan for Northland (**pRPFN**) relating to activities in the coastal marine area (**CMA**), with several specifically relating to aquaculture.

2. We understand that a concern has been raised in evidence for Aquaculture NZ that by not specifically listing matters in section 12(1) of the Resource Management Act 1991 (**RMA**) in Rule C.1.3.1 that deals with reconsenting of aquaculture activities, any existing structures would not be authorised and would thus need to be removed upon the expiry of an existing resource consent.

3. You have asked us to consider whether section 12(1) of the RMA applies to existing structures in the CMA.

Executive summary

4. Section 12(1) regulates certain activities in the CMA and provides that these activities are not able to be undertaken unless expressly allowed by a national environmental standard, a rule in a regional coastal plan (as well as a rule in a proposed regional coastal plan) or resource consent.

5. Section 12(1)(b) specifically regulates the erection, reconstruction, placement, alteration, extension, removal and demolition of structures that are fixed in, on, under or over the foreshore and seabed. Section 12(1) does not directly regulate the use of existing structures.

6. Other parts of section 12(1) will also be relevant when a structure is erected or placed on the foreshore and seabed, such as those controls relating to the disturbance of seabed in a manner likely to have an adverse effect on the seabed, plants or animals and their habitat and historic heritage (sections 12(1)(c), (e) and (g)).

7. Section 12(2) separately regulates the occupation of the common marine and coastal area. The case law is clear that occupation is a separate activity to those covered by section 12(1).

8. Section 12(3) provides that any other activity in the CMA may be carried out unless it contravenes a national environmental standard, a rule in a regional coastal plan, or rule in a proposed regional coastal plan.

9. In this case, there are no relevant national environmental standards. Given that the use of a structure is not regulated by section 12(1) and the fact the use of an existing structure is considered to be allowed (unless it contravenes the pRPFN) by section

12(3), then we do not consider that Rule C.1.3.1 in relation to the reconsenting of aquaculture activities needs to refer to activities under section 12(1) to the extent that the rule seeks to regulate the ongoing use of structures within the CMA. The occupation associated with the existing structures will be separately regulated under section 12(2).

10. However, if the Council intends that upon the reconsenting of existing aquaculture activities that structures might be replaced, altered, removed or demolished, then the Council should include the other section 12(1) matters in the list of activities that the rule regulates. Notably the current matters of control in Rule C.1.3.1 include the integrity of the structure and the need to upgrade, replace or remove any derelict or disused structures.

11. If the Council does not include these other section 12(1) activities within Rule C.1.3.1 then the matters of control in Rule C.1.3.1 may be rendered ineffective as the reconstruction and any erection or placement of a structure associated with replacing a structure is likely to be classified as an innominate activity and will require consent as a discretionary activity.[1] To the extent that replacing a structure will result in disturbance, or damage on the foreshore and seabed then the other section 12(1)(c), (e) and (g) activities should also be included in the rule.

12. Our detailed advice follows.

Section 12

13. Section 12(1) of the RMA provides for certain activities that cannot be done in the CMA, unless they are expressly allowed by a national environmental standard, a rule in a regional coastal plan (including a proposed regional coastal plan), or a resource consent. This includes section 12(1)(b), which provides:

> (b) Erect, reconstruct, place, alter, extend, remove, or demolish any structure or any part of a structure that is fixed in, on, under, or over any foreshore or seabed;

14. Notably section 12(1)(b) does not directly regulate the ongoing use of structures in the CMA.

15. Other activities in subsection (1) could also be triggered by various aquaculture activities, such as sections 12(1)(c), (e) and (g), which regulate the disturbance of seabed in a manner likely to have an adverse effect on the seabed, plants or animals and their habitat and historic heritage.[2]

16. It is clear that section 12(1) will be be triggered by various aquaculture activities, including the placement or erection of structures associated with aquaculture. What is not clear is whether permission is also required under this section in relation to the use of a structure that is already in place.

17. Section 12(2) separately regulates the occupation of space in the common marine and coastal area. This subsection provides that a person cannot occupy any part of the common marine and coastal area unless they are expressly allowed by a national environmental standard, a rule in a regional coastal plan, or a resource consent.

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[1] While the pRPFN has a range of rules regulating the replacement of structures in the CMA, the aquaculture section of the pRPFN provides that the rules in 'C1.1 General Structures' do not apply to aquaculture activities.

[2] We note that the lawful harvesting of any animals is exempted from these subsections.

18. Section 12(3) provides a more permissive, reverse presumption. It states that without limiting subsection (1), no person can carry out an activity in, on, under, or over the CMA in a manner that contravenes a national environmental standard, rule in a regional coastal plan (including a proposed regional coastal plan) or resource consent. As a result, it is the specific activities in section 12(1) that are more strictly controlled, and an activity that is not listed in section 12(1) can be carried out as long as it does not contravene a rule in the regional coastal plan (and proposed regional coastal plan).

19. Given the separate framework provided by section 12 in relation to the activities listed in subsection (1) and occupation as provided by subsection (2), it is necessary to examine how the courts have considered the relationship between the two, and what consents are required for the use of existing structures in the CMA.

Is consent required under section 12(1) to use an existing structure?

20. Several cases have confirmed (although not necessarily within an aquaculture context) that activities in relation to subsections (1) and (2) are two separate activities, and separate permissions are required for each contravention of section 12.

21. There is a long line of case law which suggests that the occupation of the CMA and the activities regulated by subsection (1) are two different activities and should therefore be consented separately.[3] The grant of a permit under subsection (1) does not imply the right to occupy under subsection (2).[4]

22. Although it is recognised that authorisation under subsection (2) is only for the occupation itself and it does not authorise other activities,[5] in this case it is the occupation of the common marine and coastal area associated with existing structures that the Council is primarily seeking to regulate.

23. The High Court has also accepted that where an activity is not specifically regulated by section 12(1), it may be allowed (subject to the provision in the regional coastal plan) by section 12(3).[6] This appears to be the situation in relation to the use of existing structures where no replacement or alteration is proposed, as this would not offend section 12(1)(b).

24. On this basis, it could be considered that as (1)(b) is specific in that it regulates the construction and alteration of structures, but not the use. Further, the occupation of space of the structure is a separate activity requiring consent under section 12(2), and the use of the existing structure (if not regulated elsewhere in the pRPFN) is an activity that is allowed by section 12(3). Therefore, in our opinion consent would not be required under (1)(b) to use an existing structure in the CMA provided that the pRPFN does not separately regulate this activity under section 12(3).

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[3] *Ngati Kahu Ki Whangaroa Co-Op Society Ltd v Northland Regional Council* [2001] NZRMA 299 (EnvC); *Hume v Auckland Regional Council* (2002) 8 ELRNZ 211, [2002] 3 NZLR 363, [2002] NZRMA 422 (CA).

[4] *Hume v Auckland Regional Council* (2002) 8 ELRNZ 211, [2002] 3 NZLR 363, [2002] NZRMA 422 (CA).

[5] *Port Otago v Hall* [1998] 2 NZLR 152, [1998] NZRMA 199, at 9.

[6] *Vining v Nelson City Council* HC Nelson CP23/99, 16 November 2000.

25. It is also worth noting the decision of the Environment Court in *Port Gore Marine Farms v Marlborough District Council,*[7] in which the Court was required to consider whether the resource consents for three mussel farms should be renewed or not. This decision stated that:[8]

> … there are potentially three sets of activities for which the proposed mussel farms may need consents:
>
> (1) to occupy the farm areas for the purpose of marine farming;
>
> (2) for construction **and use** of structures (the submerged farms) under section 12 of the RMA;
>
> (3) for managing, in the coastal marine area, the effects on fishing and fisheries resources of aquaculture activities (the farming of greenshell mussels) under section 30(2) of the RMA.
>
> The first and second categories are straight-forward: the applications are required for activities to which section 12(1) and (2) of the RMA apply, i.e. activities including erection **and use** of structures (e.g. lines, buoys etc), associated disturbance of the seabed (e.g. installing anchors), and associated occupation of water space.
>
> [emphasis added].

26. By referring to both the construction and use of structures, this decision appears to suggest that consent is required under section 12(1) to use the structures. However, in this case the farms were being reconsented but as partly submerged mussel farms rather than the standard surface mussel farms, so new structures would be required. This could explain the requirement to obtain consent for this, as "use" is not otherwise mentioned in section 12(1)(b), and it is unclear where any potential requirement to obtain consent for the use of a structure would be sourced.

Practical issues relating to Rule C.1.3.1

27. Despite our opinion above that consent is not required for the use of existing structures in the CMA under section 12(1), a practical issue arises in relation to the intention of Rule C.1.3.1.

28. The matters of control of Rule C.1.3.1 include activities which could require the replacement or reconstruction of structures. The matters of control include:

> (6) Integrity of the structure
>
> …
>
> (8) The need to upgrade, replace or remove any derelict or disused structures.

29. Given that section 12(1)(b) explicitly regulates the reconstruction, alteration, removal and demolition of structures, it appears that this rule is still seeking to control these activities in some way.

30. If the intention of this rule is to provide for a consent for the operation of aquaculture activities, including the upgrade of facilities, then it may be necessary to explicitly address section 12(1)(b) matters in order to be able to provide for the repair and replacement of structures and other associated facilities (such as buoys) within the scope of any consent granted under the rule.

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[7] *Port Gore Marine Farms v Marlborough District Council* [2012] NZEnvC 72.

[8] *Port Gore Marine Farms v Marlborough District Council* [2012] NZEnvC 72, at [98].

31. If section 12(1) is not referred to when the activity is reconsented, then there is a potential it will not fall within the activities regulated by the rule and future maintenance that may be required upon reconsenting will require a separate resource consent as an innominate activity.[9]

32. Although there is an exception in some of the section 12(1) matters for the lawful harvesting of any plant or animal, disturbance of the seabed and associated effects are also likely to occur as a result of any replacement or repair of existing structures. To the extent that replacing a structure will result in disturbance, or damage on the foreshore and seabed then the other section 12(1)(c), (e) and (g) activities should also be included in the rule.

Conclusion

33. In light of the above discussion and the case law confirming that occupation of the space in the common marine and coastal area and the actual activity of marine farming are separate activities, we consider that consent is not required under section 12(1) for the use of an existing structure when reconsenting an aquaculture activity. The use of an existing structure would fall under section 12(3), meaning that it cannot be done in a manner that contravenes a regional plan, but if it the pRPFN does not regulate the ongoing use of the structure then the activity will not contravene section 12(3).

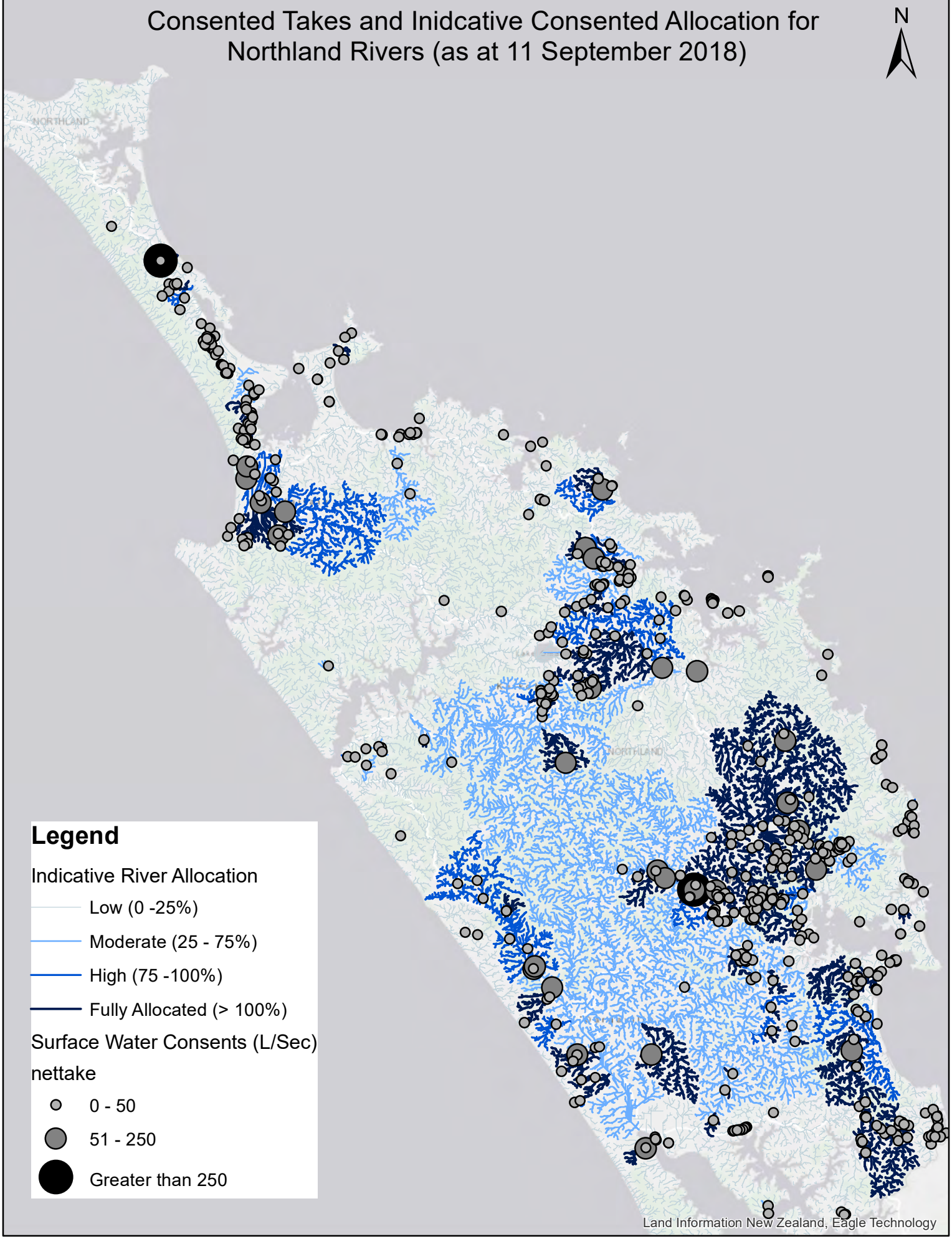
34. However, if the intention of Rule C.1.3.1 is to provide for all activities related to the aquaculture activity (including reconstruction and replacement of structures upon reconsenting), then for practical reasons it may be necessary to refer to the other section 12(1) matters within the activities that the rule covers, to ensure that future upgrading and maintenance activities are explicitly regulated by the rule too.

Wynn Williams

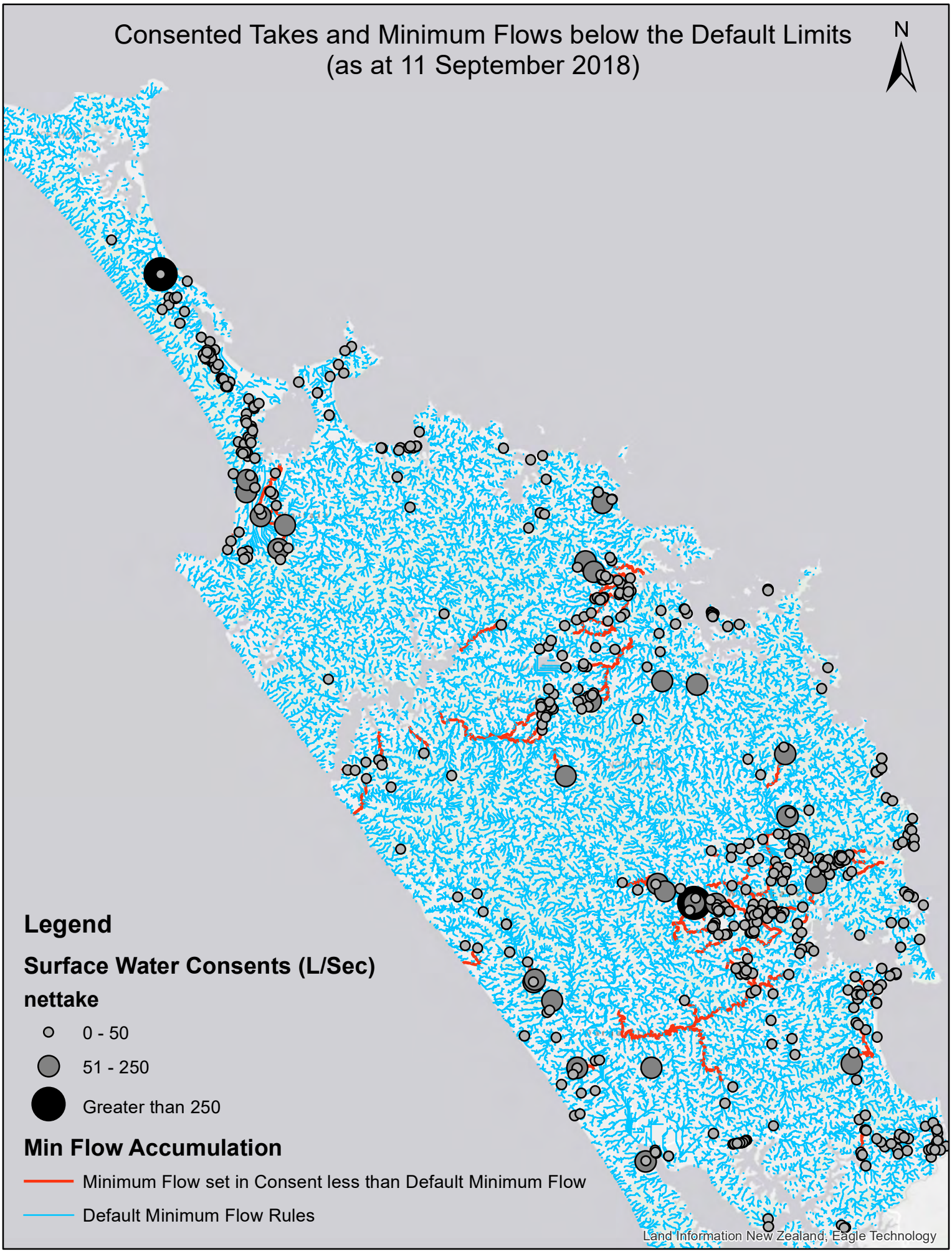
[9] While the pRPFN has a range of rules regulating the replacement of structures in the CMA, the aquaculture section of the pRPFN provides that the rules in 'C1.1 General Structures' do not apply to aquaculture activities.

Appendix 5: Allocation map September 2018

Consented Takes and Inidcative Consented Allocation for Northland Rivers (as at 11 September 2018)

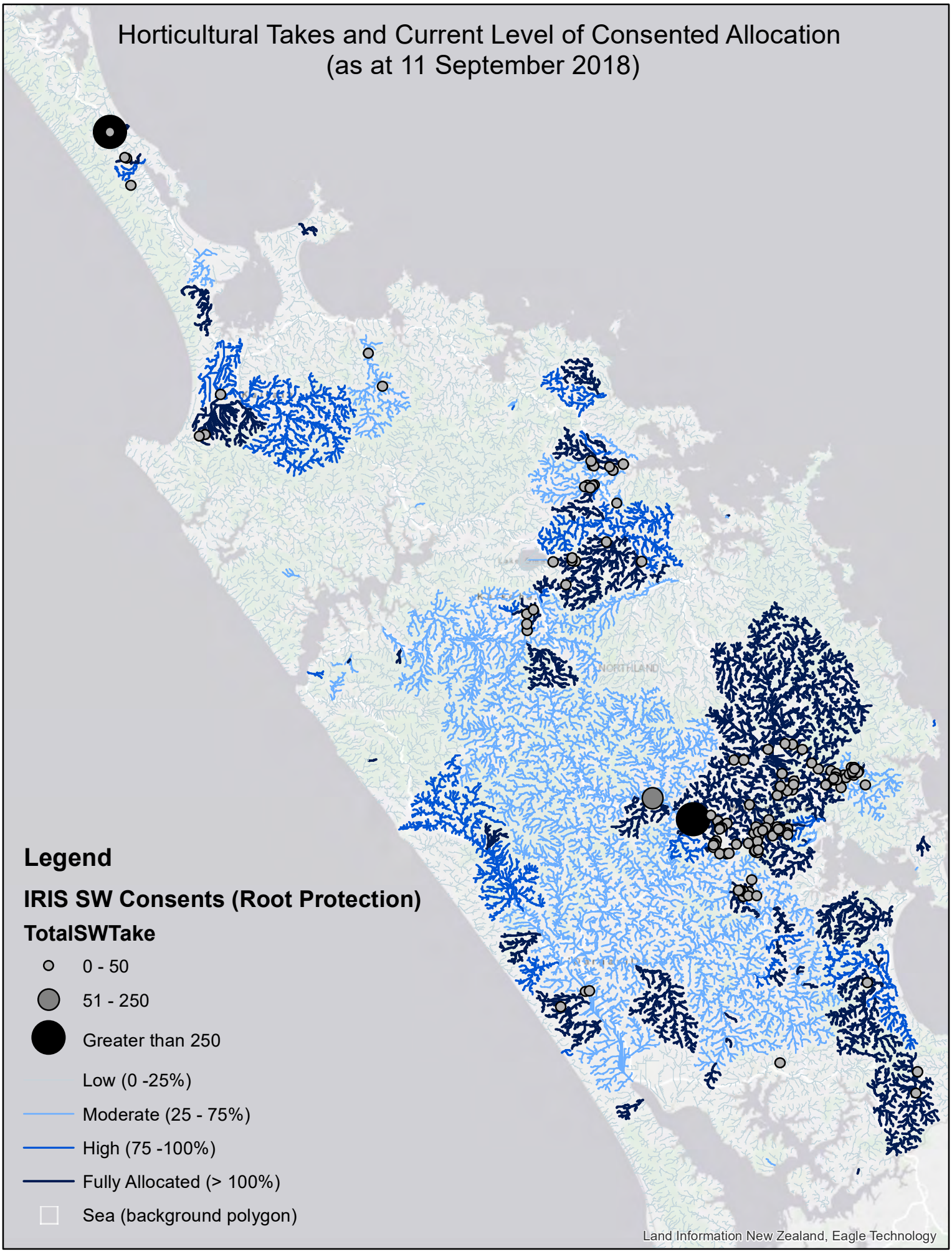


Appendix 6: Minimum flow map September 2018


Consented Takes and Minimum Flows below the Default Limits
(as at 11 September 2018)
N
Legend
Surface Water Consents (L/Sec)
nettake
0 - 50
51 - 250
Greater than 250
Min Flow Accumulation
Minimum Flow set in Consent less than Default Minimum Flow
Default Minimum Flow Rules
Land Information New Zealand, Eagle Technology

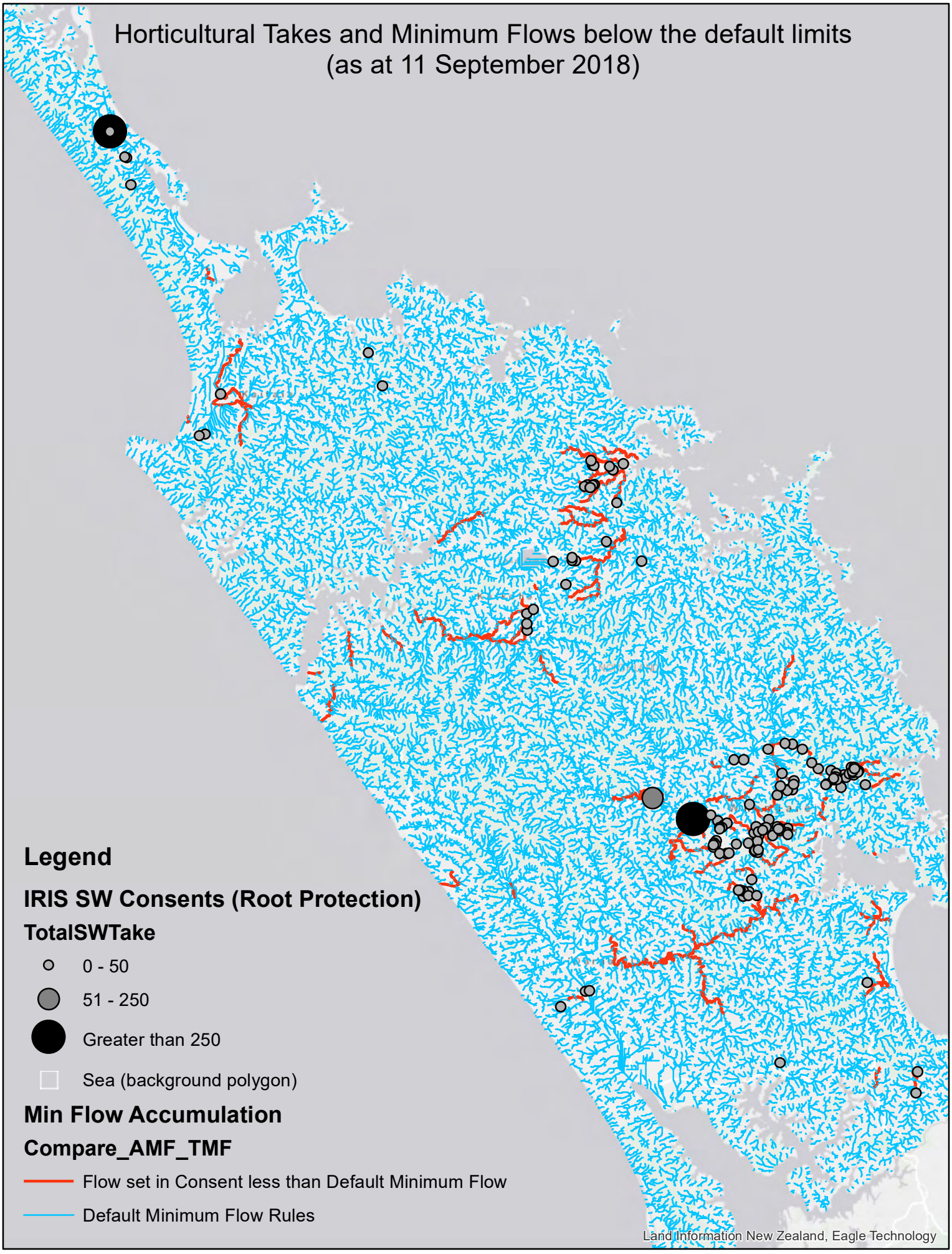
Appendix 7: Horticulture takes in moderately to fully allocated catchments September 2018

Horticultural Takes and Current Level of Consented Allocation (as at 11 September 2018)



Appendix 8: Horticulture takes from rivers where minimum flows have been set below default minimum flows

Horticultural Takes and Minimum Flows below the default limits (as at 11 September 2018)



Appendix 9: Feedback by Fonterra to the Hearing Panel on FEPs

Proposed Plan for Northland

This note responds to a request from the hearing panel for comments on how farm environment plans (FEPs) might be incorporated in to the Plan.

It has been prepared by Richard Allen, Fonterra Environmental Policy Manager, and reviewed by Gerard Willis, independent planning consultant (Enfocus Ltd).

Attached documents:

1. Generic Fonterra FEP
2. Checklist FEP content

General comments:

Fonterra is strongly supportive of the use of tailored FEPs as a method to ensure all dairy farmers are applying good management practices within reasonable transition timeframes. As presented in evidence to the Hearing Panel Fonterra has invested in systems and support capacity to ensure that nationally, all supplying farmers are operating under such an FEP by 2025 at the latest.

While we did not directly propose inclusion of FEPs in to the Plan, we are not opposed to the consideration of a regulatory FEP requirement in the Proposed Regional Plan for Northland. Fonterra is, however, very concerned to avoid the introduction of a less than robust FEP in to a rule framework. By that I mean a framework where an FEP effectively replaces having any bottom line rules and where a wide discretion in deciding how a high risk activity might be managed is left with the farm planner. While identification and efficient management of farm specific issues does require a tailored response (and therefore some degree of discretion), this response should always be guided by clear bottom lines or reference to agreed good management practices. In my opinion there is a clear risk of a perverse outcome if the introduction of a regulatory FEP undermines an existing industry programme that is more rigorous and seeks more aspirational outcomes.

We are acutely aware of the risk that FEPs could be rolled out widely, at significant cost to farmers, but be ineffective at driving true behaviour change. To manage this risk Fonterra has developed 'principles' for our FEPs to ensure that they are optimised as a change management tool. Our principles are generally consistent with the FEP requirements and rule frameworks that appear in the Southland and Waikato proposed regional plans.

Additionally, we note that the administrative burden on Northland Regional Council (NRC) from a land use consent regime (if that was to be considered) would be significant, and would be a cost passed on to farmers. Given this we wonder if FEPs might better be considered in methods and policies of the pRPN as an approach that might be applied through future FMU level rules to more sensitive catchments, where that is found to be appropriate.

Despite the above comment, if a practical, robust and enforceable FEP was to be included as a condition of the permitted rule for the use of land for farming, Fonterra would likely support this in principle provided:

- There were appropriate transition times;
- There was a default to a restricted discretionary activity (RDA) rule where a farm was not able to meet the permitted activity conditions;

- That such an FEP did not replace the regional council's ability to manage high risk activities through specific conditions in other rules or resource consent.

Suggested FEP principles for Northland:

- FEPs are delivered / approved by appropriately qualified people (we are supportive of the Certified Farm Environment Planner approach in the Proposed Plan Change 1 to the Waikato Regional Plan)
- The Plan should identify all significant risk areas, for all of the relevant contaminants - at a minimum these include sediment, E. coli, nitrogen and phosphorus), and have a timebound action – within the life of the Regional Plan – that will address the risk to a level consistent with recognised GMP for that issue. (We agree with Beef and Lamb that the Good Farming Practice Guidelines make a sensible starting point for FEP action guidance and we already reference these guidelines wherever relevant in our FEPs).
- The tailored actions for the management of risk areas / critical source areas in an FEP are backed up by appropriate regulatory minimum standards for high risk activities (eg effluent management / discharge rules, stock exclusion rules, land preparation / cultivation rules, land clearance rules)
- FEPs are flexible enough to allow for the updating of actions by a certified person, but robust / certain enough to ensure breaches of minimum standards in the regional plan (at the very least) remain enforceable by the regional council.
- The Farm Planner discretion should be limited, with a clear and detailed schedule in the Plan setting out FEP requirements. (We would recommend some alignment with the FEP schedules in the Proposed Waikato and Southland Plans as a starting point).
- Regulatory FEPS should be subject to third party audit, managed by the regulator, with council retaining an ability to remove certification of a CFEP for work that does not meet the FEP schedule or is inconsistent with the Certification agreement.

Rule Framework:

If the Panel is minded to add an FEP requirement into the Plan, the following basic rule framework to manage farming as a land use should be adopted. (Note we have provided a basic framework at this point but would be open to engaging a planner to draft more detailed provisions if that would be of use to the Panel).

We are also open to working with the regional council and other parties to refine the details of a Schedule describing the Farm Environment Plan if that would assist the Panel.

- **Permitted activity rule A:**
  Small low risk properties: Properties of less than 20ha, that do not carry out any higher risk activities (e.g. feedlotting, dairy, high stocking rate calf rearing) are permitted activities with no FEP requirement.

- **Permitted activity rule B:**

All farming properties above 20ha (or less than 20ha but carrying out a high risk activity): Land use for farming is permitted until the date at which an FEP is required, but subject to the specific minimum standard rules (e.g. effluent, stock exclusion earthworks, cultivation, land clearance)

- **Permitted activity rule C:**
  All farming properties above 20ha (or less than 20ha but carrying out a high risk activity): Land use for farming is permitted from the date an FEP is required, subject to having an FEP in place that is consistent with Schedule X and the minimum standards set out in other rules in the regional plan; **and;** the timebound actions described in the FEP are being implemented.

- **Restricted discretionary activity rule D:**
  Properties not meeting the conditions of permitted activity rules A, B or C above: Land Use for farming where a property is not operating under a Schedule X compliant FEP, including implementing the timebound actions described in the FEP, by (FEP required date) is a Restricted Discretionary Activity.

- **Schedule X – Contents of an FEP:** Is a detailed schedule along the lines of the schedules in the Proposed Waikato Plan Change 1 (Schedule 1) and Proposed Southland Water and Land Plan (Appendix N).

  See as an example FEP Schedule (pSWLP) appended below, noting that we believe the pRPN schedule would need to be tailored to the Northland situation – in particular the nutrient management Overseer provisions and the Nitrogen reference point approach would not be appropriate in the Northland Plan.

1 – Proposed Southland Water and Land Plan:

Appendix N – Farm Environmental Management Plan Requirements

Part A – Farm Environmental Management Plans

A Farm Environmental Management Plan (FEMP) can be based on either of:

1. the material set out in Part B below; or

2. industry prepared FEMP templates and guidance material, with Southland-specific supplementary material added where relevant, so that it includes the material set out in Part B below.

Part B – Farm Environmental Management Plan Content

1. A written FEMP that is:

(a) prepared and retained, identifying the matters set out in clauses 2 to 5 below; and

(b) reviewed at least once every 12 months by the landholding owner or their agent and the outcome of the review documented; and

(c) provided to the Southland Regional Council upon request.

2. The FEMP contains the following landholding details:

(a) physical address; and

(b) description of the landholding ownership and the owner's contact details; and

(c) legal description(s) of the landholding; and

(d) a list of all resource consents held for the landholding and their expiry dates.

3. The FEMP contains a map(s) or aerial photograph(s) of the landholding at a scale that clearly shows the locations of:

(a) the boundaries; and

(b) the physiographic zones (and variants where applicable) and soil types (or Topoclimate South soil maps); and

(c) all lakes, rivers, streams, ponds, artificial watercourses, modified watercourses and natural wetlands; and

(d) all existing and proposed riparian vegetation and fences (or other stock exclusion methods) adjacent to waterbodies; and

(e) places where stock access or cross water bodies (including bridges, culverts and fords); and

(f) all known subsurface drainage system(s) and the locations of the drain outlets; and

(g) all land that may be cultivated and land to be cultivated over the next 12-month period; and

(h) all land that may be intensively winter grazed and the land to be planted for winter grazing for the next period 1 May to 30 September; and

(i) for land to be cultivated or intensively winter grazed:

(i) critical source areas; and

(ii) intended setbacks from any lake, river (excluding ephemeral rivers), artificial watercourses, modified watercourse or natural wetland; and

(iii) land with a slope greater than 20 degrees.

4. Nutrient Budget

For all landholdings over 20ha, the FEMP contains a nutrient budget (which includes nutrient losses to the environment) calculated using the latest version of the OVERSEER model in accordance with the latest version of the OVERSEER Best Practice Data Input Standards (or an Proposed Southland Water and Land Plan (Decisions Version, 4 April 2018) Page 188

alternative model approved by the Chief Executive of Southland Regional Council), and which is repeated:

(a) where a material change in land use associated with the farming activity occurs (including a change in crop area, crop rotation length, type of crops grown, stocking rate or stock type) at the end of the year in which the change occurs, and also every three years after the change occurs; and

(b) each time the nutrient budget is repeated all the input data used to prepare it shall be reviewed by or on behalf of the landholding owner, for the purposes of ensuring the nutrient budget accurately reflects the farming system. A record of the input data review shall be kept by the landholding owner.

5. Good Management Practices

The FEMP contains a good management practices section which identifies:

(a) the good management practices implemented since 3 June 2016; and

(b) the good management practices which will be undertaken over the coming 12-month period. These must include practices for:

(i) the reduction of sediment and nutrient losses from critical source areas, particularly those associated with overland flow;

(ii) cultivation (including practices such as contour ploughing, strip cultivation or direct drilling);

(iii) the use of land for intensive winter grazing (including those practices specified in Rule 20(a)(iii);

(iv) riparian areas (including those from which stock are excluded under Rule 70) and the type of riparian vegetation to be planted, how it will be maintained and how weeds will be controlled;

(v) minimising of the discharge of contaminants to surface water or groundwater, with particular reference to the contaminant pathways identified for the landholding.

Examples of general good management practices are provided on the Southland Regional Council, DairyNZ and Beef and Lamb New Zealand websites and in the document38 titled "Industry-agreed Good Management Practices relating to water quality, Version 2, 18 September 2015".

Appendix 10: Memo to NRC from NIWA

Memo

From	**Cathy Kilroy, Fleur Matheson**
To	Ben Tait Northland Regional Council
Date	12 October 2018
Subject	Review of technical evidence: setting periphyton and nutrient limits for controlling nuisance periphyton

Background

Northland Regional Council's Proposed Regional Plan (PRPN, Northland Regional Council 2017a) has been open for consultation since September 2017. A submission on the PRPN has been received from Kathryn McArthur, on behalf of the Department of Conservation (McArthur 2018). The submission focuses on freshwater quality and suggests that numeric limits for (a) periphyton biomass and cover and (b) nutrient concentrations in rivers and streams are included in the PRPN to protect ecosystem health.

The proposed plan currently includes no such numeric limits except that Policy D.4.1 specifies limits for nitrate-nitrogen (NO_3-N) and ammoniacal nitrogen (NH_4-N)[1]. Policy D.4.1 notes: "*These standards will be replaced with numeric freshwater quality objectives in accordance with the regional council's programme for implementing the National Policy Statement for Freshwater Management*." Section 4.3 (Activities not assessed) of the Section 32 report (Northland Regional Council 2017b) provided justification for not including numeric limits for periphyton or nutrient concentrations (other than those noted above).

Northland Regional Council has requested from NIWA a "*technical review on Kathryn's commentary and recommendations on including numeric periphyton objectives in the proposed plan (for chl-a biomass and cover) and recommended numeric annual average DIN and DRP objectives/standards for the purposes of meeting numeric periphyton objectives*".

Scope of review

From discussions with Northland Regional Council leading up the to the request, the most important requirement was interpreted as a technical review of Paragraphs 88 to 98 in McArthur (2018), which includes recommended numeric goals for DIN and DRP "to assist in meeting numeric periphyton goals …. for Northland". We also include a review of paragraphs 65 to 72, which cover numeric goals for periphyton cover and biomass. The scope of the review is limited to a technical commentary on these portions of the McArthur (2018) evidence. The scope does not include any review of or commentary on the PRPN or the Section 32 report.

The review includes comments on use of technical terminology (i.e., minor comments) as well as on broader concepts. Comments are presented as numbered paragraphs for ease of reference. References to paragraphs in McArthur (2018) are shown in bold type. Key statements are underlined.

Review of paragraphs 65 to 71: Trophic state: periphyton biomass and cover

1. **Paragraphs 65 to 71** of McArthur (2018) set out justification for inclusion in the PRPN of numeric goals for periphyton biomass and cover in Northland rivers, and present recommendations for goals.

[1] The limits for NO_3-N and NH_4-N in the PRPN are the same as those specified in the National Policy Statement for Freshwater Management (NPS-FM) for protection of aquatic ecosystems from the toxic effects of elevated concentrations of these nutrients. For NO_3-N, the limits are those placing sites in Band A, and apply to all sites. For NH_4-N, the limits are those placing "outstanding" rivers in Band A, and all other rivers in "Band B".

2. In **paragraph 65**, technically, chlorophyll *a* is a measure of biomass, not the other way around. Biomass is defined as the quantity of organisms in an area or volume. For periphyton (which comprises mainly algae), measuring chlorophyll *a* is a convenient way to represent living biomass because all algae contain chlorophyll *a*.

3. We agree that there are advantages and disadvantages to the use of both chlorophyll *a* and visual estimates of cover as measures of periphyton in rivers (**paragraphs 66, 67 and 68**). As noted in **paragraph 65**, the two measures are complementary. Kilroy et al. (2013) found strong relationships between cover and chlorophyll *a* in three Canterbury rivers. These relationships appear to work best at the within-river scale and are unlikely to be transferable from region to region (e.g., Kilroy et al. 2017, Kilroy et al. 2018, Greenfield 2016). Refer to MfE (2018a) for guidance on the use of visual assessment methods in assessment of river status against the NPS-FM periphyton attribute.

4. We agree that weighted composite cover (WCC) is a useful measure of the combined effect on ecosystems (noted in **paragraph 70**) of thick periphyton cover of both major types (mats and filaments, as defined by Biggs 2000a). Nevertheless, it is still necessary to estimate cover on the stream bed of mats and filaments separately in order to calculate WCC. Therefore, the advantage of using WCC implied in **paragraph 69** (that separate visual estimates of cover by mats and filaments are not needed) is not valid. In practice, WCC is an additional (and complementary) rather than an alternative measure and is especially useful when periphyton comprises mixed mats and filaments.

5. It is not clear from **paragraph 71** and **Table 2** whether numeric limits (goals) for both biomass and periphyton WCC are being recommended. Both are useful (subject to the commentary above that percentage cover by mats and filaments separately will also be available).

6. In principle, we agree that setting numeric limits is appropriate, and that the limits should apply to only hard bottomed streams (**paragraph 71**).

7. "Periphyton biomass mg/m^{2}" should be worded as Periphyton chlorophyll *a* (mg/m^{2}).

8. We note that the biomass (i.e., chlorophyll *a*) goals in **Table 2** are the same as those used in the periphyton attribute of the NPS-FM as thresholds separating Bands A, B, C and D, but no metric is defined in Table 2. As presented, the goals are hard maxima, and any exceedance will breach the goal. The NPS-FM requires monthly sampling and its metric provides for an average of one annual exceedance of the chlorophyll *a* threshold, calculated over a three-year period, or two annual exceedances for streams in the productive class[2]. Another way of describing this metric is exceedance of the threshold for no more than 8% or the time (or 17% for streams in the productive class). The threshold then becomes the 92nd (or 83rd) percentile of chlorophyll *a* (calculated from at least 3 years of data). The NPS-FM metric acknowledges that occasional high periphyton biomass can arise (e.g., in unusually long periods of low flows), and these occasional blooms have only a temporary effect.[3] Any numeric periphyton objective should include a clearly defined metric. We suggest that the NPS-FM metric for periphyton is appropriate for setting regional limits (and note that other regional councils have adopted a similar metric – e.g., Environment Canterbury, over 12 samples).

[2] Streams in the productive class are those belonging to defined combinations of REC climate and geology classes that are known to be associated with naturally high productivity (i.e., nutrient availability). Refer to Snelder et al. (2013) for details.

[3] "… natural variability in the frequency of floods, and therefore biomass accrual period, means that some naturally occurring excursions beyond each threshold can be expected occasionally, even in relatively non-enriched systems. Streams and rivers are resilient and ecological health will usually recover quickly from such excursions if they are infrequent and of a short duration." (Snelder et al. 2013)

9. Restricting applicability of the periphyton goals to hard-bottomed rivers is generally appropriate. We note that the issue of hard and soft-bottomed streams is discussed in the Section 32 report.

General comments and conclusions

10. **Paragraphs 65 to 71** suggest that the PRPN should include numeric limits for periphyton in hard-bottomed streams. We agree with this suggestion in principle. We also agree that the limits should be based on the national thresholds for periphyton (as chlorophyll *a*) in the NPS-FM. However, our understanding from NRC's implementation programme for the NPS-FM[4], is that setting of numeric freshwater objectives for rivers is already scheduled, with a commitment to amend the PRNP in 2021 by including chlorophyll *a* objectives and associated numeric nutrient criteria (see below). In view of the fact that NRC are still in the process of collecting, evaluating and analysing periphyton and nutrient data in the region to assess current state and relationships, the delay signalled in the Section 32 report is justified.
11. It is important to note that the numeric thresholds for periphyton chlorophyll *a* set in the NPS-FM, and also in Matheson et al. (2012) using WCC, are effects-based. In other words, the thresholds were derived from general relationships between chlorophyll *a* or periphyton cover, and river ecosystem health indicators (in particular, indices based on macroinvertebrate community composition). Therefore, the thresholds are expected to be largely independent of region.
12. Derivation of WCC requires estimates of percentage cover of the stream bed by both filaments and mats. This provides options for setting limits for cover by filamentous algae (for recreational values, for example).

Review of paragraphs 88 to 98: Nutrients: DIN and DRP

1. **Paragraphs 88 to 98** set out justification for inclusion of numeric goals for DIN and DRP "to assist in meeting numeric periphyton goals in the PRPN for Northland", with recommendations for the numeric goals (expressed as annual mean values).
2. **Paragraph 88** should state that elevated NO3-N and NH4-N concentrations can have direct toxic effects on macroinvertebrates (Camargo and Alonso 2006). This is implied in **paragraph 89** (sentence beginning "nitrate and ammonia can be toxic ….''). It would be clearer to have all discussion of toxic effects in one place, also noting the toxic effects are being managed at a national level through the Nitrate (toxicity) and Ammonia (toxicity) attributes in the NPS-FM (and also in the PRPN).
3. **Paragraphs 89 and 90** provide reasonable background to DIN and DRP sources. It is probably also worth noting that DRP interacts strongly with inorganic particles and can become alternately available and unavailable for biological uptake depending on the chemical conditions of the surrounding medium. For example, low DO (anoxia) at the streambed can lead to release of soluble P from sediments (Withers and Jarvie 2008, Wood et al. 2015). Consequently, it can be challenging to detect relationships between DRP in the water column and periphyton biomass.
4. The fact that periphyton can potentially influence instream DIN and DRP concentrations though instream uptake is important (**paragraphs 89 and 90**). Instream uptake complicates development of relationships between DIN or DRP and periphyton, especially in summer. For this reason, links

[4] https://www.nrc.govt.nz/media/9590/northlandregionalcouncilsprogrammeforimplementingthenationalpolicystatementforfreshwatermanagementmarch2018.pdf

between periphyton and DIN or DRP (from which nutrient limits can be derived) usually emerge only using data averaged over at least a year, and preferably longer.

5. For example, the empirical relationships developed by Biggs (2000b) took this approach. Biggs (2000b) was able to explain a high proportion of variability in chlorophyll *a* (across the dataset tested) from nutrient concentrations and flows (converted to accrual period – the time between floods available for periphyton to accumulate). However, the Biggs (2000b) relationships are restricted to a subset of river types (Matheson et al. 2012), are limited to rivers with DIN < 0.3 mg/L, and consequently have performed poorly when applied to regional datasets for predicting chlorophyll *a* (e.g., Kilroy et al. 2017, 2018). Biggs (2000b) acknowledged that regional-scale relationships would need to be developed.

6. As noted in **paragraph 91**, the Note added to the periphyton objective in the 2017 updated version of the NPS-FM now obliges Regional Councils to "*at least set appropriate instream concentrations and exceedance criteria limits*" for DIN and DRP for the specific purpose of achieving appropriate periphyton objectives within their freshwater management units. The Note also takes account of nutrient inputs to sensitive downstream environments.

7. The Ministry for the Environment has acknowledged the potential complexity of the process for setting appropriate instream concentrations and exceedance criteria limits for managing periphyton. The Ministry has therefore published guidance for Regional Councils on how the Note could be implemented (MfE 2018b), including detailed guidance on the option of developing an empirical model specific to a region, using long-term data (summarised in Figure 2 in MfE (2018b)).

8. Recent work on long time series periphyton data indicates that a statistical approach based on regression techniques applied at a regional scale can yield robust empirically-based predictive models (e.g., Kilroy et al. (2017, 2018))[5]. The resultant models always included additional explanatory variables (e.g., water temperature, conductivity) and may operate on subsets of stream or river sites (e.g., unshaded sites, Kilroy et al. 2017; sites that are sensitive to flow variability, Kilroy et al. 2018).

9. Important findings from the analyses underpinning updated regional models for Canterbury rivers include: (a) refining the definition of flood size that typically removes periphyton[6] can improve model performance; and (b) water conductivity can be a stronger predictor of peak periphyton biomass than either flows or nutrients (DIN or DRP).

10. In **paragraphs 92 and 93**, McArthur (2018) maintains that variables other than nutrient concentrations and flows (e.g., light, temperature) have "limited effects on periphyton growth". This may be true in some cases, but recent analyses – as discussed in paragraphs 8 and 9 above – have highlighted that inclusion of variables other than nutrient concentrations and models can greatly improve their predictive performance.

11. Furthermore, the most robust relationships for predicting peak chlorophyll *a* at a site (represented as the 92nd percentile of chlorophyll *a*) required at least three years of data (Kilroy et al. 2018), or were specific within a year, depending on hydrological conditions (Kilroy et al. 2017).

12. We agree with McArthur (2018) that "Setting appropriate numerical nutrient goals is not a precise science" (**paragraph 97**). Nevertheless, in our view, setting limits based on reliable relationships is

[5] This was the approach used by Biggs (2000).

[6] The flow magnitude that typically removes periphyton is often assumed to be about 3 x median flow. The 3 x median flow threshold was based on work by Clausen and Biggs (1997). Biggs (2000) based calculations of accrual period on the frequency of floods exceeding 3 x median, as did Depree and Walter (2016).

more defensible and understandable, than selecting limits based only on "experience" (**paragraph 98** and **Table 7** in McArthur 2018).

13. At the beginning of 2018, Northland Regional Council had accumulated three years of monthly data at >30 sites across the region, fulfilling the data collection steps set out in Figure 2 in MfE (2018b). Consequently, there are now sufficient data to begin the process of developing regional relationships between periphyton, flows, nutrients and other environmental variables, as recommended in MfE (2018b).
14. We suggest that numeric nutrient limits are not defined until the results of those analyses are available (i.e., following the process suggested in MfE 2018b). We think this is preferable to selecting more or less arbitrary limits now (as in **Table 7**), and then having to change them once more defensible limits are identified from the more robust process identified in MfE (2018b).

General comments and conclusions

15. McArthur (2018) has suggested numeric goals for DIN and DRP for the management of nuisance periphyton in Northland rivers in two FMU types (Outstanding rivers/Hill country rivers and Lowland rivers) (Table 7). The numeric values are justified on the basis of "experience".
16. The demonstrated complexity of relationships between periphyton biomass and environmental variables means that such experience-based goals are not easily defensible.
17. The recently released "Draft technical guide to the Periphyton Attribute Note" (MfE 2018b) contains a step-by-step process specifically aimed at assisting Regional Councils set "appropriate instream concentrations and exceedance criteria for nitrogen and phosphorus to achieve periphyton objectives, while ensuring the outcomes sought for sensitive downstream environments are also achieved."
18. The process set out in MfE (2018b) includes "process steps recommended if development of a regional model is considered the best option for deriving robust nutrient criteria".
19. Northland Regional Council has already initiated model development by collecting appropriate data. We suggest it could be specified in the PRPN that a regional model is being developed to determine robust DIN and DRP limits for the management of nuisance periphyton in Northland.

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Appendix 11: Commentary on coastal sediment standards

COMMENTARY ON COASTAL SEDIMENT STANDARDS

RICHARD GRIFFTHS
NRC COASTAL SCIENTIST

1.0 Purpose and scope of statement

1.1 This written statement has been prepared on request by Ben Tait, Policy Specialist, to provide comment on the coastal sediment standards in the Proposed Regional Plan for Northland.

1.2 Specifically, I was asked to provide comment on the appropriateness of the ANZECC 2000 and Canadian Environmental Quality Guidelines, when setting coastal sediment standards for Northland.

1.3 I am a Coastal Scientist, with Northland Regional Council (Council). I have been employed by Council since January 2008. I am responsible for Council's coastal state of the environment monitoring programmes, including water quality programmes in Whangārei Harbour, Bay of Islands, Kaipara Harbour and Mangawhai Harbour, and sediment monitoring programmes in Whangārei Harbour and Bay of Islands. I have also implemented an estuarine monitoring programme to assess the ecosystem health of Northland's estuaries. I am responsible for Council's investigation of sediment accumulation rates in Northland estuaries. I also carry out consent compliance monitoring and investigate coastal incidents.

1.4 I have previously worked for Auckland University Services, where I conducted estuary monitoring programmes for Auckland Regional Council (now Auckland Council) and undertook shellfish stock assessments for the Ministry of Fisheries (now Ministry of Primary industries).

1.5 I have previously worked in inshore fisheries management in the UK, and in London as an environmental consultant.

1.6 I hold a Masters degree in Marine Environmental Protection, from the University of Wales, Bangor, UK.

2.0 Introduction

2.1 Metal contaminants can have lethal and sub-lethal effects on marine organisms. Although plants and animals can usually regulate metal contaminants within a certain range, metals that cannot be excreted remain within the organisms and accumulate over time. As metals accumulate in an organism they can interfere with biological processes. The contaminants can also move progressively up the food chain as organisms are consumed by other animals and humans so this can ultimately pose a risk to human health. In a contaminated environment the species diversity and species richness may decrease as the community becomes dominated by a smaller number of more tolerant species which are able to survive and reproduce in these conditions. Metal contaminants are generally not subject to bacterial attack or other breakdown so are permanent additions to the marine environment.

3.0 International sediment guidelines

3.1 The National Oceanic and Atmospheric Administration (NOAA) have developed effects range low (ERL) and effects range median (ERM) concentrations for toxicants in marine and estuarine sediments (Long *et al.* 1995). The concentrations were derived from a database of toxicity tests where effects on test species have been observed. The data was ranked from the lowest concentration to the highest. The ERL corresponds to the 10th percentile of concentrations that generated an effect. The ERL indicates the concentration below which adverse effects are unlikely to be observed. The ERM corresponds to the 50th percentile of concentrations that generated an effect. The ERM indicates concentrations above which adverse effects are expected to occur more frequently.

3.2 The ANZECC 2000 guidelines for sediment have been adapted from Long *et al.* (1995) and include trigger values for a range of metals, metalloids, organometallic and organic sediment contaminants. The ANZECC 2000 ISQG-Low trigger values and ISQG-High trigger correspond to the ERL and ERM used in the NOAA listings.

3.3 The Canadian Environmental Quality Guidelines also include standards for sediment toxicants (Canadian Council of Ministers of the Environment 2007) which were derived from a biological effects database. These guidelines include a threshold effects level (TEL) and a probable effects level (PEL). The procedure for deriving these guidelines involved both an effects data set and a no effects data base. The TEL values were derived by calculating the mean of the 15th percentile of the effects data set and the 50th percentile of the no effect data set. The PEL values were derived by calculating the mean of the 50th percentile of the effects data set and the 85th percentile of the no effects data set.

3.4 The two values define three ranges: (1) the minimal effect range within which adverse effects rarely occur (that is, fewer than 25% adverse effects occur below TEL); (2) the possible effect range (the range between TEL and PEL); and (3) the probable effect range within which adverse biological effects frequently occur (that is, more than a 50% chance of adverse effects occur above PEL). The Canadian TELs are more conservative than the ANZECC 2000 guidelines ISQG-Low trigger values (Table 1) which reflects the use of both the no effects data set in and the effects data set to calculate the TELs.

4.0 Ecological community responses

4.1 Hewitt et al. (2009) conducted research on stormwater contamination (copper, lead and zinc) and intertidal ecology communities in the Auckland Region. This research derived guidelines for copper, zinc and lead from field based species sensitivity distributions that predicted a 50% decrease in abundance of 5% of the taxa. Values at which 5% of the taxa would be affected were predicted to occur somewhere between concentrations of 6.5 - 9.3mg/kg for copper, 18.8 - 19.4 mg/kg for lead and 114 - 118 mg/kg for zinc.

4.2 Furthermore their multivariate model demonstrated considerable changes in the ecological community below even these derived guideline values.

4.3 This research suggests that ecological community responses may well occur below both the ANZECC ISQG-Low trigger values and the Canadian TELs.

5.0 Background sediment metal concentrations in Northland

5.1 Background concentrations of metal contaminants are very low in Northland. Council has collected metal sediment data from 114 sites as part of a number of state of the environment monitoring programmes throughout Northland. The 80th percentiles were calculated from Council's sediment data for Tidal Creek, Estuarine, Open Coast and Hātea River waters. The 80th percentiles of all metal contaminants were below the ANZECC 2000 ISQG-Low trigger values and the Canadian TELs (Table 1 and 2) in Tidal Creek, Estuarine and Open Coast zones. In the Hātea River, the 80th percentiles for copper, lead and zinc were above the Canadian TELs but below the ANZECC 2000 ISQG-low trigger values. However, sediment concentrations at two sites in the Hātea River did exceed the ANZECC 2000 ISQG-Low trigger values (Griffiths, 2014). The 80th percentiles for chromium, nickel and cadmium were below both the Canadian TELs and the ANZECC 2000 ISQG-Low trigger values (Tables 1 and 2).

Table 1: ANZECC 2000 guidelines, NOAA and Canadian sediment guidelines for selected metal contaminants.

	ANZECC 2000 guidelines		NOAA		Canadian guidelines	
	ISQG -Low	ISQG -High	ERL	ERM	TEL	PEL
Copper (mg/kg)	65	270	34	270	18.7	108
Lead (mg/kg)	50	220	46.7	218	30.2	112
Zinc (mg/kg)	200	410	150	410	124	271
Chromium (mg/kg)	80	370	81	370	52.3	160
Nickel (mg/kg)	21	52	20.9	51.6	15.9	42.8
Cadmium (mg/kg)	1.5	10	1.2	9.6	0.68	4.21

Table 2: 80th percentiles derived from reference data for sediment metal.

Ecosystem condition	Condition 1 & 2	Condition 1 & 2	Condition 1 & 2	Condition 3
Zone	Tidal creek	Estuarine	Open coast	Hātea River
Copper (mg/kg)	17.0	10.0	2.2	47.6
Lead (mg/kg)	9.8	7.1	3.7	27.4
Zinc (mg/kg)	67.0	48.0	17.6	172
Chromium (mg/kg)	16.0	16.0	10.0	22.8
Nickel (mg/kg)	9.5	8.3	4.7	12.8
Cadmium (mg/kg)	0.09	0.09	0.09	0.16

6.0 Recommendation

6.1 For Northland coastal waters, I recommended that the Canadian TELs be adopted for Tidal Creeks, Estuaries and Open Coast zones. Sediment concentrations in Northland are generally well below these values. Indigenous ecological communities and the constituent fauna and flora that make up these communities will be adapted to these local ambient conditions. Furthermore, research by Hewitt *et al*. (2009) has found community responses in New Zealand intertidal communities below both the ANZECC 2000 ISQG-Low trigger values and the Canadian TELs.

6.2 If the ANZECC ISQG-Low concentrations were adopted it may in effect permit a deterioration in the quality of Northland's coastal water resources. Section 69 of the RMA states that Regional Councils shall not set a standard in a plan which results, or may result, in a reduction of the quality of the water in any waters at the time of the public notification of the proposed plan.

6.3 The ANZECC 2000 ISQG-Low trigger values were proposed for the Hātea River, because several sites in the Hātea River have metal concentrations that already exceed the Canadian TELs and at some sites the ANZECC ISQG-Low trigger values (Griffiths, 2014). Metal contaminants are not subject to bacterial attack or breakdown so are essentially permanent additions to the marine environments. The legacy of historical activities therefore means it will be difficult for levels at these sites to reduce significantly in the short-term.

7.0 Standards vs guidelines

7.1 Both the ANZECC 2000 and Canadian TEL are presented as guidelines. The ANZECC 2000 guideline document emphasises a number of issues and uncertainties with the methodology used to derive the values and states that the trigger values should not be used as pass or fail values but should instead be used as triggers to prompt further action and investigation.

7.2 However, given that the background concentrations of sediment metals in Northland are below the Canadian TEL, and that Hewitt *et al.* (2009) have identified ecological community responses below the Canadian TEL in the Auckland Region, I feel it is justified to utilise the values in the Canadian TELs as 'standards'.

7.3 The current plan utilised some of the ANZECC 1992 guidelines for metals as 'standards' and this has not presented any problems.

7.4 From a consenting and compliance perspective the use of the term 'guidelines' presents a number of difficulties and uncertainties. In contrast, the term 'standards' provides clarity and certainty to resource users, consent officers, compliance officers, and the wider community about what standards are required for activities in the coastal marine area.

7.5 For example, applicants for resource consents may face significant unwarranted effort and costs if they or Council are required to determine specific standards for their activity, using for example local effects based experiments or whole effluent toxicity (WET) tests.

7.6 Similarly, when Council are tasked with assessing whether an activity is complaint with the Regional Plan or a resource consent, the use of the term 'guideline', provides significant uncertainty. Council may have to undertake further investigation of what impact the activity is having on the local ecology before taking any enforcement action. Again this would require time consuming and expensive local effects based experiments or whole effluent toxicity (WET) tests. Investigations of this nature for each activity would place a huge cost and burden on resource users and Council.

8.0 Total metal concentration versus

8.1 The CCME (1999) guideline document states:

'Canadian ISQGs are recommended for total concentrations of chemicals in freshwater and marine surficial sediments (i.e., top 5 cm), as quantified by standardized analytical protocols for each chemical. For the analytical quantification of metals in sediments, the choice of digestion method is dependent on the intended use of the results (e.g., for quantification of the bioavailable fraction or for geochemical evaluation). Because ISQGs are intended to be used for evaluating the potential for biological effects, "near-total" trace metal extraction methods that remove the biologically available fraction of metals and not residual metals (i.e., those metals held within the lattice framework of the sediment) are recommended for determining sediment metal concentrations. A strong extraction method using hydrofluoric acid would remove both the bioavailable and residual fractions of metals in the sediment. Therefore in this chapter, the concentration of "total" metal refers to the concentration of metal recovered using a near-total (mild digestion; e.g., aqua regia, nitric acid, or hydrochloric acid) method.'

8.2 Standard metal preparation for metal analysis of sediment samples collected by Northland Regional Council is US EPA 200.8 digest for 'total recoverable' metals in solids (1:1 Nitric:Hydrochloric Acid). This is equivalent to the requirement/recommendation in the Canadian guideline document (CCME 1999) that sediment be analysed for the bioavailable fraction.

8.3 Both Watercare Laboratory Services and Hill Laboratories, the two main laboratory service providers in New Zealand, perform this preparation (total recoverable) on sediment samples. The 'total digest' method requires hydrofluoric acid, which is hazardous and very hard on laboratory instruments. It is likely that most, if not all, sediment samples collected in New Zealand use the 'total recoverable' preparation method i.e. the bioavailable fraction.

8.4 As 'total recoverable' is the only preparation method performed by Council's laboratory service provider, all sediment samples are and will continue to be analysed using the same method (i.e., the bioavailable fraction). Therefore, the same preparation method will be used for samples collected form the Hātea River and the other three management units (Tidal Creeks, Estuaries and Open Coast). I do not feel that it is necessary to add this technical detail in the proposed Regional Plan.

8.5 If it is desirable to add this technical detail, I propose that the following text apply to the entire table of coastal sediment standards: ‘Total recoverable metal by dry weight (mg/kg)’.

Richard Griffiths
BSc, MSc

25th October 2018

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Appendix 12: Simon Hunt - Evidence

BEFORE THE	NORTHLAND REGIONAL COUNCIL PROPOSED REGIONAL PLAN INDEPENDENT HEARINGS PANEL
IN THE MATTER	of the Resource Management Act 1991
AND	
IN THE MATTER	response to the Hearing of the Proposed Regional Plan for Northland

STATEMENT OF EVEINCE BY SIMON DONALD HUNT FOR NORTHLAND REGIONAL COUNCIL

30 October 2018

BRIEF OF EVIDENCE OF SIMON DONALD HUNT

Introduction and Qualifications

1. My full name is Simon Donald Hunt, I am an environmental scientist and I reside in Auckland.

2. I am a Technical Director and co-founder of EHS Support New Zealand Ltd (EHS Support), an environmental consulting and contracting company I formed (jointly with two other senior practitioners) in May 2018. I undertake management and technical work for EHS Support throughout New Zealand and provide technical support to EHS Support LLC (our USA affiliate) with international operations in Australia and the USA.

3. I hold a BSc (Hons) in Geography and Geology majoring in Geology from the College of St Paul and St Mary in the United Kingdom (UK), graduating in 1985, and an MSc and Diploma of Imperial College in Environmental Technology from Imperial College, University of London in the UK, graduating in 1988.

4. I am member of the Geological Society, London; a Chartered Geologist (awarded in 2000), a Chartered Environmental Practitioner – Contaminated Land Specialist (CEnvP-CS awarded in 2016) and have previously been a registered independent Resource Management Commissioner. I have held a board position with the Australasian Land and Groundwater Association for the last 5 years and have previously been deputy chair of the Waste Management Institute of New Zealand (WasteMINZ) Contaminated Land Sector Group. I am currently the New Zealand registrar for the CEnvP-CS and have held this role since 2016.

5. I have over 30 years of environmental management experience, principally focussed on assessment, remediation and management of contaminated sites. This experience has been gained in industry (approximately 10 years working for an international oil company – Chevron/Caltex) and as an environmental consultant (20 years). I have undertaken contaminated land work in multiple countries, including the UK, New Zealand, Australia, Philippines, Thailand, Malaysia, Singapore, South Africa, Holland, Northern Ireland, China, Fiji and Antarctica.

6. Between 1997 and 2006 I was employed by Chevron New Zealand (Chevron – trading as Caltex New Zealand) and held various health, environmental and safety (HES) roles conducted work for the Chevron in New Zealand, South East Asia and South Africa. During my tenure at Chevron, I worked on various international initiatives – developing international contaminated land management procedures, provided training for staff and contractors in environmental site assessment and risk assessment worked with a small global team to develop an international liability management company. In addition, I was involved with the development of international safe work practices and environmental procedures. My other Chevron duties included support buying and selling of businesses and assets, surrendering leases, implementing HES management systems and auditing, construction and demolition of facilities, and managing the New Zealand contaminated land liability/portfolio.

7. While at Chevron I acted as a technical expert for significant/sensitive contamination issues in South East Asia. Key projects performed included dealing with a significant petrol loss in Manila that had resulted in fatalities, major loss of petrol from a large bulk tank on the Batangas Refinery (loss comprising many 1,000's of litres), Philippines that had entered a surface watercourse, and the contamination of a shallow potable drinking water supply aquifer from a service station in Manila.

8. In the last 30 years I have successfully undertaken site assessment and remediation work on many 100's of sites globally for various industry, commercial and government agency clients.

9. The bulk of my contaminated land experience has focussed on contamination associated with industrial activity - oil storage and manufacturing, chemical manufacturing, gasworks, waste disposal etc. I have extensive experience dealing with Light Non-Aqueous Phase Liquids (LNAPL – such as petrol, diesel, white spirit, jet fuel etc.) and Dense Non-Aqueous Phase Liquids (DNAPL – coal tars, bitumen, chlorinated solvents etc.).

10. I have been intimately involved in the development of central and local government contaminated site policy and guidance in New Zealand, and in particular:

(1) Contaminated site policy development for Wellington, Otago and Northland Regional Councils.

(2) Steering committee member developing the Ministry for the Environment (MfE) Contaminated Land Management Guideline 5 – Site Investigation and Analysis of Soils[1].

(3) Preparation of sections of the MfE Guidelines for Assessing and Managing Contaminated Gasworks Sites in New Zealand[2]. Workshopped and provided oversight on the deployment of the MfE Guidelines for Assessing and Managing Petroleum Hydrocarbon Industry Sites in New Zealand[3]. Preparation of guideline sections relating to LNAPL. Under contract to MfE, I managed the development of a New Zealand guidance document on the natural attenuation of petroleum hydrocarbon contaminated groundwater and use of bioaccessability in human health risk assessment.

(4) Retained as 1 of 2 national peer reviewers of MfE's 2006/7 national contaminated site policy[4] and industry member of MfE's Contaminated Site's Policy Reference Group for the development of the National Environmental Standard (NES) for Assessing and Managing Contaminants in Soil to Protect Human Health (NES-CS)[5]. Member of the WasteMINZ committee developing an accreditation system for contaminated land professionals required by the NES.

11. I routinely provide expert opinion/technical support to large scale insurance claims and expert evidence in legal cases, examples include:

(1) Expert opinion and review of contaminated land issues associated with the jet fuel loss from the Refinery to Auckland Pipeline in 2017.

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[1]Ministry for the Environment, 2004. *Contaminated Land Management Guidelines 5. Site Investigation and Analysis of Soils.*
[2]Ministry for the Environment, 1997. *Guidelines for the Management of Contaminated Gasworks Sites in New Zealand.*
[3]Ministry for the Environment, 1999. *Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand.*
[4]Ministry for the Environment, 2006. *Working Towards a Comprehensive Policy Framework for Managing Contaminated Land in New Zealand. A Discussion Paper.*
[5] Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011.

(2) Gave evidence in the High Court in support Mobil Oil New Zealand Ltd regarding contamination and historic oil company operating practices on the Western Reclamation in Auckland.

12. Since 1992 I have been actively presenting at national and international conferences on various issues associated with contaminated land management and have co-authored several published papers.

13. I consider the matters on which I express an opinion are within my field of expertise and consider myself as a Suitably Qualified and Experienced Practitioner (SQEP). I have read the Environment Court Code of Conduct[6] and understand the duty that this place upon me as an expert witness, and I agree to be bound by the code.

14. In preparing my expert opinion I have been assisted by several EHS Support staff based in New Zealand and the USA.

Scope of Evidence

15. I have been retained by Northland Regional Council to provide technical support on contaminated land management issues to the Council Officers involved in developing the Section C.6.8 - Contaminated Land Rules set out in the Proposed Regional Plan for Northland September 2017 and 26 June 2018 revision[7] (hereafter referred to as the Plan).

16. My technical support has comprised of discussions with Council officers during development of the contaminated land rules, review of initial/draft rules and supporting documentation developed by Council officers, review of submissions on the Plan and the section 42A hearing report[8], and review of evidence submitted at the Hearing on the Plan for Northland in August 2018. I have reviewed the evidence submitted by Mr Graeme Proffitt and Mr David Le Marquand representing the oil industry and Ms Sharon Tenger

[6] Environment Court Practice Note. 2014 *Part (7) Expert Witnesses*.

[7] Proposed Regional Plan for Northland. September 2017 and 26 June 2018.

[8] Northland Regional Council. 3 July 2018. *Contaminated Land. Recommendations in response to submissions on the Proposed Regional Plan for Northland. Section 42A Hearing Report.*

representing Soil and Rock Consultants. I have also listened to the audio delivery of Mr Proffitt's and Mr Le Marquand's evidence.

17. My evidence addresses various technical and management issues raised Mr Proffitt, Mr Le Marquand and Ms Tenger in their evidence and at the hearing, in particular:

(1) Need for a policy statement on contaminated land management.

(2) Preparation and sign-off of contaminated land reports.

(3) Use of lines of evidence in the management of contaminated sites.

(4) Management of LNAPL and the proposed rules.

(5) Management of DNAPL and the proposed rules.

(6) Rules relating to Per and Polyfluoroalkyl Substances.

(7) Use of sediment quality guidelines

Statement on the Council's Contaminated Land Management Approach

18. While there may not be scope within process followed to prepare the Plan, the C.6.8 Contaminated Land rules and consultation, if possible I would recommend that the rules be supported by an upfront section (or similar) on the operational philosophy behind the rules and how the Council propose to manage contaminated site issues once the Plan becomes operable.

19. This would assist all stakeholders using the C.6.8 rules with a greater level of clarity and insight on the interpretation and application of the rules. This would allow for issues such as the following to be explained in more detail:

(1) What is meant by and how the term "demonstrates" (as detailed in the opening line of rule C.6.8.2 (2) should be complied with and the level of information needed to demonstrate compliance.

(2) The need for the SQEP to identify the contaminants of concern for the site being assessed, which will require a robust preliminary site investigation. This will avoid unnecessary time and effort (and expense) chasing contaminants that are not related to the history of the site being assessed. At the same time, it will be incumbent on the SQEP to ensure that appropriate guidance is used for contaminants of concern not addressed by the rule, for example emerging contaminants of concern (such as PFAS that is discussed further below) and the use of the MfE Contaminated Land Management Guidelines No. 2 Hierarchy and Application in New Zealand of Environmental Guidelines[9].

20. The upfront section would also provide opportunity for the Council to explain the relationship between the contaminated land rules in the Plan and the rules relating to the management of contaminated land (including the NES-CS) that are stewarded by territorial local authorities (TLAs). The rules within the Plan have deliberately not referenced soil contaminant concentrations as these are typically dealt with through the NES-CS which is administered by the TLAs.

Preparation and Sign-Off of Contaminated Land Reports

21. I agree with the comments made that the qualifications and experience of a contaminated land SQEP should be defined in the Plan. The requirements set out in the NES-CS Users Guide[10] should be adopted and contaminated land reports should be signed off by a SQEP. This requires (as a minimum) a SQEP to be a:

(a) Senior or principal scientist/engineer.

(b) Relevant tertiary qualification.

(c) At least 10 years contaminated land experience.

22. This definition still creates confusion and uncertainty for regulators assessing whether a practitioner signing off on contaminated land work has the required level of experience

[9]Ministry for the Environment. 2011. *Contaminated Land Management Guidelines No. 2 Hierarchy and Application in New Zealand of Environmental Guidelines.*

[10]Ministry for the Environment. 2011. *Users Guide: National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health.*

without vetting the practitioners (or similar). I would therefore recommend that this definition also include a professional certification to ensure that practitioner signing off on a contaminated site operates ethically and within their area of technical expertise. The CEnvP-CS was specifically developed by the New Zealand Australian contaminated land industry (regulators, practitioners and industry) to provide a greater level of certainty on the quality of the contaminated land work being undertaken and provides a professional measure of competence.

23. Since the introduction of the CEnvP-CS certification several regulatory agencies are using this chartered status in their rules to ensure practitioners with a measured level of competence are signing off on contaminated land reports. For example, New South Wales (NSW) EPA has recently mandated that all contaminated land reports need to be signed off by a practitioner certified through the CEnvP-CS and Marlborough District Council has adopted a similar approach.

24. I therefore recommend that the SQEP definition in Section B be updated to include the minimum requirements described above and for the SQEP to have a professional certification, which ideally should be CEnvP-CS (or similar chartered status).

Use of Lines of Evidence in the Management of Contaminated Sites

25. Contaminated land projects are typically complex; even small projects require a range of technical disciplines to identify potential risks (which could comprise a mix of health, environmental and commercial/financial implications) and establish the most appropriate strategy to manage the contamination site/issues.

26. Contaminated site assessment and remediation work typically use a "lines of evidence" (referred to as weight of evidence in recent updated MfE guidance for contaminated sites[11]) approach to demonstrate and communicate that an appropriate level of assessment work has been performed, that the risks are fully understood/characterised and verify performance of remedial/management work. Use and application of professional judgement is needed throughout this process. The use of accepted lines of evidence assists

[11]Ministry for the Environment. *Contaminated Land Management Guidelines 1 and 5 – Reporting on Contaminated Sites in New Zealand (revised draft 2016) and Site Investigation and Analysis of Soils (revised draft 2016).*

in ensuring consistency between practitioners and that key project risks, constraints and uncertainty are identified and their significance adequately assessed.

27. I concur with Mr Proffitt's statement(s) that lines of evidence are needed to assess the more complex project sites and contaminated site issues (such as LNAPL and DNAPL issues), particularly when there are greater levels of uncertainty with the data being assessed. However, a lines of evidence approach for permitted activity criteria poses a challenge because the effects need to be no more than minor and the method by which compliance is assessed needs to be simple and measurable. For these reasons Council officers have developed permitted activity rules that meet these criteria (as far as practicable).

28. If a lines of evidence/weight of evidence approach is to be included in the Plan, it will be necessary to provide a definition in Section B of the Proposed Plan and where possible direct/inform practitioners of the lines of evidence required particularly for permitted activities. The use of lines of evidence could be described in the upfront section to the rules described above.

Management of LNAPL and the Proposed Rules

29. Rule C.6.8.2 (3) aims to provide an objective and measurable method to define whether leaving LNAPL on a site does not pose a risk (coupled with Rule C.6.8.2 (5)) subject to other criteria defined in the contaminated rules (namely vapour and groundwater contamination – Rules C.6.8.2 (2)) and should be granted permitted activity status or not. LNAPL transmissivity provides responsible parties assessing site contamination against the rules and council officers determining compliance with the rules with a simple method by which a level of certainty can be applied to granting permitted activity to a plume of LNAPL.

30. Mr Proffitt has commented on the basic science of LNAPL formation and mobility and I do not need to elaborate further on this.

31. The rule asks the responsible party to establish whether the LNAPL plume is stable or is there the potential for LNAPL to migrate and pose a risk. Aged LNAPL plumes that have been in place for many years are often in equilibrium with the groundwater system, while sites impacted by a recent LNAPL releases are more likely to have mobile LNAPL. Aged

LNAPL plumes may become mobile through changing conditions, such as changes in the groundwater regime (e.g. through groundwater abstraction) or through changes in the site geology (such as the construction of service trenches).

32. Mr Proffitt is incorrect in his statements on the background and origin of LNAPL transmissivity and that it relates to solely to recoverability. Historically LNAPL thickness was used by regulators to determine both whether LNAPL was potentially mobile or recoverable. In the 1990s the oil industry internationally spent many years advocating that LNAPL thickness was a poor indicator of mobility/recoverability and facilitating the development of guidance that utilised direct measurements of mobility. The science behind LNAPL mobility was principally generated through a collaborative effort between the major/international oil companies, industry bodies (such as the American Petroleum Institute) and regulators in the USA during the late 1990s and early/mid 2000s. I was working internationally for Chevron during this period and worked with Chevron technical specialists who were intimately involved with LNAPL mobility development work and witnessed the development work. The success of this collaboration has been adoption of LNAPL transmissivity as a regulatory tool in the USA and other jurisdictions, plus development of guidance and standards on LNAPL transmissivity. Certainly, LNAPL transmissivity assists in establishing the likelihood of whether LNAPL in a geologic formation is recoverable from a remediation perspective. However, more importantly the LNAPL transmissivity value is used to establish when no-further regulatory action is required and that LNAPL does not pose a risk (subject to other criteria). LNAPL transmissivity can be considered as and is used as a Tier 1 risk screening value, much in the same way that the soil guideline values used by the NES-CS[12] present conservative health risk criteria for contaminants in soil below which the contaminants do not pose a risk (subject to certain criteria).

33. LNAPL transmissivity is routinely used in the USA to establish when no further regulatory action is required and is used in a similar manner in Australia to justify that a LNAPL plume has achieved "clean up to the extent practicable" (CUTEP for example in Victoria and South Australia) and can be managed and left in place. It also provides the responsible party with

[12]Ministry for the Environment. 2011. *National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health.*

a level of certainty that the liability from the LNAPL is acceptable to the regulators. I have successfully used LNAPL transmissivity as justification to New Zealand clients and regulators to leave LNAPL plumes in place and manage the contamination through institutional controls.

34. I do not necessarily agree with Mr Proffitt's comment that a SQEP should be able to define the lines of evidence needed to determine if LNAPL is mobile. Not all SQEPs are able to make this determination (because there expertise may not include LNAPL related projects) and there is a lack of guidance in New Zealand on LNAPL management and mobility. The local guidance that does exist is contained within MfE guidance that was issued in 1999 (Section 4.1.1)[13], was written by me and is a little out of date (relative to current science and understanding). Consequently, SQEPs will have to look to other overseas guidance to define the lines of evidence needed to define LNAPL mobility. It is therefore important for the Council to assist SQEPs in this process and define minimum assessment requirements (particularly in the context of permitted activity rules).

35. One of the key reasons why a measurable definition of LNAPL mobility was suggested as a permitted activity was because of the problems legacy Auckland Regional Council and the oil industry had in the mid-2000s when the original Auckland Regional Plan was being developed and a subjective (written) definition of mobile LNAPL was proposed. This situation created a significant amount of angst and frustration for both the oil industry and the regulator, in part because of a mis-understanding of the science of LNAPL mobility and because a subjective definition had been suggested. I personally ran several workshops for legacy Auckland Regional Council staff on LNAPL mobility to assist in their upskilling and understanding of the science behind LNAPL mobility.

36. Mr Proffitt has suggested that a lines of evidence approach be adopted for the management of LNAPL. While I agree this is a logical approach, but as discussed above for a permitted activity, it is imperative that objective and measurable definitions are used (as far as is practical) to define when LNAPL is mobile, to screen LNAPL plumes from a regulatory context and either allow the LNAPL plume to be a permitted activity or require

[13] Ministry for the Environment. 2011.*Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand.*

it to be regulated through a resource consent. An alternative objective measure of LNAPL mobility could be the requirement for eight quarterly groundwater monitoring rounds (perhaps including groundwater sampling and testing) to verify that the LNAPL plume is stable and not mobile/migrating. In terms of monitoring this would be deemed best practice in the USA and the need for detailed monitoring of LNAPL plumes was highlighted in the draft New Zealand Natural Attenuation Handbook for the Management of Petroleum Hydrocarbon Contaminated Groundwater[14]. Long term monitoring often places a time and cost burden on the responsible party and assumes an adequate number of groundwater monitoring wells have been installed to verify LNAPL mobility.

37. I have every confidence the major oil companies, who Mr Proffitt represented at the hearing, undertake robust investigations of LNAPL impacted sites and use appropriate lines of evidence to establish whether LNAPL is mobile and does not pose a risk. However, in recent years there has been an increase in the number of smaller operators owning/running re-fuelling sites who do not have the technical understanding and/or financial willingness to fund investigations of LNAPL impacted sites. Often these smaller operators retain environmental specialists based on cost, not experience, who are not SQEPs and/or who are not sufficiently competent to undertake LNAPL assessments, thus creating problems for the responsible party and the regulator. Having an objective measure of LNAPL mobility for permitted activity rules which screen sites for resource consents provides a certainty for all stakeholders and results in better human health and environmental outcomes.

38. The way in which the permitted activity LNAPL mobility rule C.6.8.2 (3) is currently written requires the responsible party to demonstrate a lack of mobility through the measurement of transmissivity. To allow for more flexibility in the rule, while retaining the intent of using measurable criteria, the rule could be re-written as follows – "Demonstrate that LNAPL is not mobile through a lines of evidence approach using either a LNAPL transmissivity of less than 0.07 square meters per day or through eight quarterly monitoring rounds in source and sentinel groundwater monitoring wells to verify that the LNAPL has not migrated". The various rules set out in C.6.8.2 (2) and (5) will also assist managing the risk from LNAPL.

[14]Ministry for the Environment. August 2001. *Draft Natural Attenuation Handbook for the Management of Petroleum Hydrocarbon Contaminated Groundwater.*

Management of DNAPL and the Proposed Rules

39. DNAPL impacted sites, particularly those impacted with chlorinated solvents, are typically complex to assess and manage – in part because DNAPLs can migrate laterally and vertically. These sites often require a significant amount of assessment work to fully characterise the impacts (requiring groundwater monitoring wells to be installed at multiple levels within underlying aquifer(s)) and to build a robust conceptual site model that enables a suitable strategy to manage the contamination to be developed.

40. I concur with Mr Proffitt's comment that rules C.6.8.2 (2) contain groundwater and soil gas thresholds for contaminants typical of DNAPLs found in New Zealand. However, the reason rule C.6.8.2 (4) was written, and to a lesser extent rule C.6.8.2 (5), was to ensure that responsible parties for sites potentially impacted with DNAPLs undertake a sufficient amount of investigation and assessment work to verify whether mobile and separate phase DNAPL is not present on a site and verify the findings against the permitted activity criteria. For a permitted activity there is a need to have a high level of certainty that there are not significant issues of concern associated with these contaminants.

41. The presence of DNAPL on site acts as an on-going source for groundwater and vapour contamination and so it is imperative for all stakeholders to have knowledge of the status of the source(s). In this situation a lines of evidence approach will be needed to verify compliance with rule C.6.8.2 (4) and could leverage the lines of evidence presented in the Assessment and Delineation of DNAPL Source Zones at Hazardous Waste Sites, Kueper and Davies. 2009[15]. This will enable a robust conceptual site model to be developed that will allow the risks posed by the contamination to be appropriately managed. Reliance on downgradient groundwater and soil gas monitoring (which is likely to occur at the site boundary – as would be captured by rule C.6.8.2 (2)) will not necessarily drive/force the level of rigour that is needed to fully assess DNAPL sites. DNAPL impacted sites require proactive management, particularly where sensitive receptors exist (such as neighbours at risk from vapour intrusion or groundwater abstraction), and to place sole reliance on down

[15]US Environmental Protection Agency. *2009. Ground Water Issue. (EPA/600/R-09/119). Kueper. B and Davies. K.*

gradient site boundary groundwater and vapour monitoring (or 50 m from the source (which the rules allow for), when the source may not be that well known) to verify that there is not a significant on-site or off-site issue is in appropriate for a permitted activity.

42. I would recommend that to assist responsible parties to better interpret and apply the rule that it be re-written as follows – "verify using acknowledged lines of evidence that dense non-aqueous phase liquids are not mobile and in free phase form".

Rules Relating to Per and Polyfluoroalkyl Substances

43. I concur with Mr Proffitt's comment that PFAS is "currently flavour of the month". While there may be scepticism among some New Zealand based practitioners as to the level of attention being given to PFAS; not all senior practitioners hold such a view. In part the scepticism appears due to the level of attention PFAS is receiving (and the commercial/financial issues associated with this contaminant) in Australia, the USA and Europe, but this is also very much a function of the late action taken by central and local government agencies. Government agencies, like industry, tend to be reactive rather than proactive, hence there is always an issue of concern that gains prominence. In recent times in New Zealand issues such as asbestos (following the Christchurch earthquake), health and safety (following Pike River) and methamphetamine have all gained prominence at times for justifiable reasons.

44. When the contaminated land rules were initially prepared by the Council officers in early 2017 the PFAS issue had not come to prominence in New Zealand. Hence inclusion of this emerging contaminant in the rules as a "place holder" to give the Council officers the ability to regulate if need be. Since initial drafting of the Plan a significant amount of work has been undertaken by various government agencies over the last 18 months to deal to PFAS issues (as described by Mr Proffitt). On the basis that central government is very close to issuing guidance on the management of PFAS it seems sensible to defer to this guidance once issued. To ensure PFAS can be captured in the interim and depending on the scope of the impending central government guidance, I would recommend that the thresholds for PFAS be deleted from the permitted activity rule and the discharge of these contaminants be managed as a discretionary activity. This would allow any new Ministry for the

Environment guidance or relevant international guidance to be taken into account as outlined in MfE's Contaminated Land Management Guidelines No. 2 Hierarchy and Application in New Zealand of Environmental Guidelines, 2011[16].

Use of Sediment Quality Guidelines

45. The Soil and Rock Consultants evidence, prepared by Ms Tenger and dated 14 August 2018, requests inclusion of sediment quality (as detailed in the Australian and New Zealand Guidelines for Fresh and Marine Waters. Australian and New Zealand Conservation Council. 2000[17]) within the list of permitted activity criteria. I would not recommend sediment quality be added to the current list of permitted activity criteria (as a media that could be impacted from a contaminated site) because rarely do sediment issues arise from contaminated land. In that impacted sediment from contaminated sites generally arises through stormwater run-off and there are existing rules within the Plan that regulate stormwater run-off. In rare circumstances sediment could be impacted through groundwater discharges into a surface water course.

46. Should sediment be identified as an issue of concern at a site, the practitioner undertaking the investigation work can use the MfE Contaminated Land Management Guidelines No.2. Hierarchy and Application in New Zealand of Environmental Guidelines[18] as the basis for selecting the assessment criteria for potentially impacted sediment.

Simon D Hunt - 30 October 2018

[16]Ministry for the Environment. 2011. *Contaminated Land Management Guidelines No. 2 Hierarchy and Application in New Zealand of Environmental Guidelines.*

[17]Australian and New Zealand Conservation Council. 2000. *Australian and New Zealand Guidelines for Fresh and Marine Waters.*

[18]Ministry for the Environment. 2011. Contaminated Land Management Guidelines No. 2 *Hierarchy and Application in New Zealand of Environmental Guidelines.*