

BEFORE THE CANTERBURY REGIONAL COUNCIL

IN THE MATTER OF the Resource Management Act 1991

AND

IN THE MATTER OF five resource consent applications filed by **Ngāi Tahu Forest Estates Limited** in relation to:

CRC132458 to take and divert water

CRC147370 to divert water (fish bypass)

CRC 147369 to use water for irrigation

CRC142438 to discharge water to water

CRC144606 to change the use of land which may result in the discharge of nitrogen or phosphorus

REPORT AND DECISION OF HEARING COMMISSIONERS

PAUL ROGERS and EMMA CHRISTMAS

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1 INTRODUCTION

- 1.1 Paul Rogers (Chair), Emma Christmas, and Yvette Couch-Lewis were appointed as independent hearing Commissioners by the Canterbury Regional Council (CRC) under Section 34A (1) of the Resource Management Act 1991 (RMA) to decide on three applications by Ngāi Tahu Forests Estates Ltd (NTFE). Because of a request made by NTFE as to how we should approach the three applications, we ultimately decide *five* applications. We explain this within our decision. This decision sets out our findings on the applications, focusing on the principal issues in contention and the reasons for our decision.
- 1.2 In addition to the evidence and submissions provided by NTFE and submitters at the hearing, we record that we have all read and taken full account of the application documents, including the Assessments of Environmental Effects and all of the written submissions. Although not every witness and submission is referred to in our decision, this does not mean that they have not been considered, simply that we have endeavoured to focus on key issues and, where possible, avoid repetition in our decision.
- 1.3 In accordance with Section 113(3) RMA, we have also cross-referenced and adopted parts of the Assessment of Environmental Effects, the Section 42A Officer Reports, and written evidence throughout this decision as appropriate.
- 1.4 To assist the reader, we have attached **Appendix 1**, which lists the acronyms and abbreviations used throughout this decision.

2 EXECUTIVE SUMMARY

- 2.1 NTFE seeks to take water from the Waiau River for the purpose of irrigating the block of land it owns known as the Balmoral Forest (Balmoral) over some 15 years. We more comprehensively define Balmoral within section 5 of our decision. The existing forest will be progressively cleared from Balmoral and converted into a range of farming systems.
- 2.2 While the resource consents before us relate to the taking, use, diversion, and discharge of water, along with the change of use of land, NTFE has not applied for land use consents to extend the existing Waiau canal onto Balmoral. In the future, NTFE proposes to store water on Balmoral, and consents will be required for those activities. Those activities have not been considered in this decision.
- 2.3 There are a number of different planning instruments relevant to our considerations. We think foremost among those plans is the Hurunui and Waiau River Regional Plan (HWRRP).
- 2.4 The NTFE proposal gives rise to a number of considerations¹ under the HWRRP. Of those considerations, water quality is a principal focus.
- 2.5 The key issue in understanding water quality is that there will be increased nutrient losses, particularly nitrogen and phosphorus, as a result of applying water to land. Critically, if this be the case, then we need to understand how these nutrients may affect the quality of surface water, particularly within the Hurunui River and groundwater.
- 2.6 The HWRRP sets nutrient limits in the form of concentrations and loads for the entire Hurunui catchment. We need to understand the level of 'headroom' available within the catchment. We then need to understand the level of nutrient losses that may arise from this proposal if this proposal is consented (after considering and allowing for conditions). Critically, we need to understand whether granting consent to this proposal will result in the concentrations and load limits provided for within the HWRRP being met.
- 2.7 If those concentrations and load limits are not met, then the status of the activity is non-complying. Before we can consider granting consent we must be satisfied under s104D of

¹ Including the effects of that take on fish, river birds, natural character, recreational users, water quality, periphyton, and effects on other abstractors, amongst others.

the RMA that either the effects on the environment are no more than minor or, alternatively, that the granting of consent would not be contrary to the objectives and policies of the HWRRP.

- 2.8 Despite the mitigation measures proposed by NTFE, we have reached the conclusion that granting consent to the highly developed farming proposal (which is NTFE's preference) will have unavoidable and unacceptable adverse effects on the environment. Those effects centre on nutrient losses from Balmoral and the consequent impact of those nutrient losses on the quality of surface water, particularly within the Hurunui River. Also, granting consent would be contrary to the objectives and policies within the HWRRP that relate to cumulative effects of land use on water quality and also would be contrary to the objectives and policies of higher order planning documents that relate to water quality.
- 2.9 However, in terms of NTFE's application to take, divert and discharge water from and to the Waiau River, granting those consents would be possible because the effects of that activity are acceptable and that activity is in accord with the objectives and policies relating to environmental flows, allocation of water, and efficient use of that water within the HWRRP and higher order planning documents.
- 2.10 We are therefore not able to grant consent to the preferred highly developed NTFE dairying proposal as promoted to us. However, we consider that the purpose of the RMA would still be met by granting consent to a reduced development involving dryland farming and/or a limited dairying operation with a reduced or scaled back water take and limited irrigation area on Balmoral.
- 2.11 We also note we do not accept the NTFE position that it can utilise the nutrient discharge allocation granted to HWP. This finding has a fundamental impact on the NTFE proposal.

3 DESCRIPTION OF THE NTFE PROPOSAL

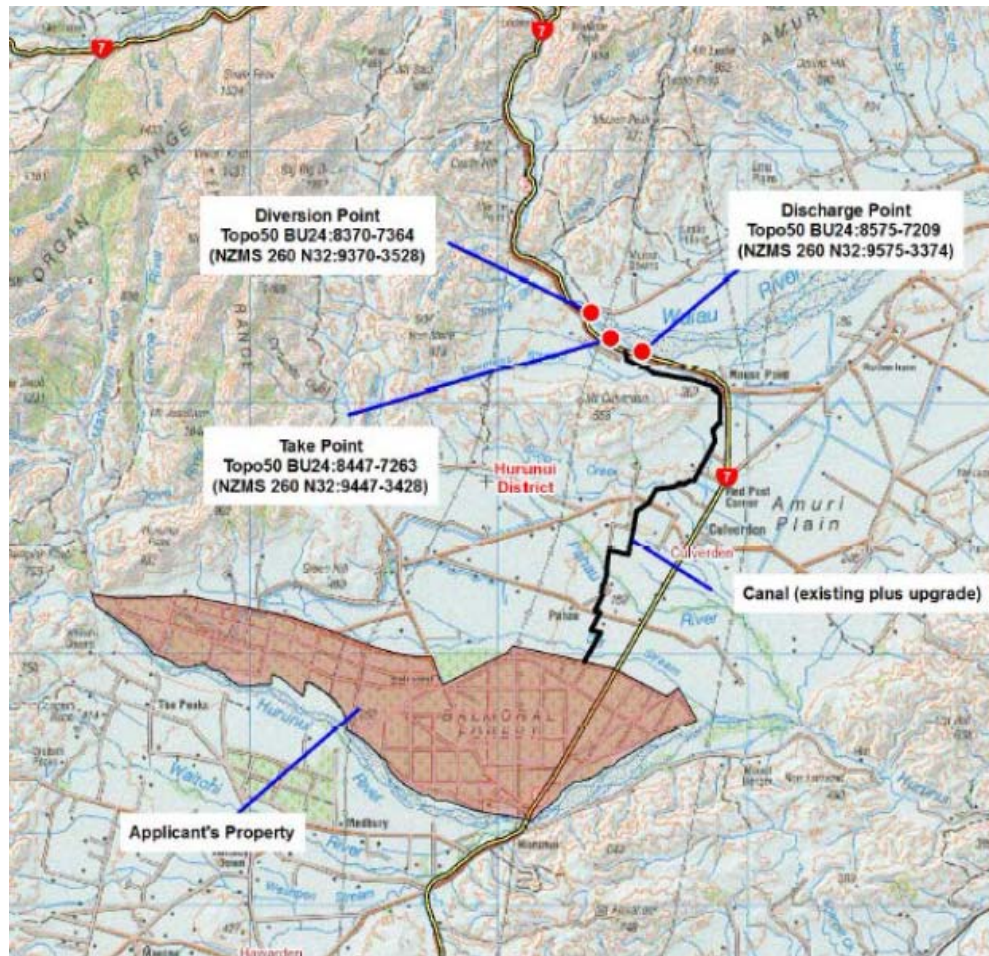
- 3.1 Balmoral comprises 8596 hectares (ha) of land owned by NTFE located in Northern Canterbury between the Waiau and the Hurunui Rivers on the Amuri Plains. Balmoral has historically been used for forestry activities. However, NTFE now wishes to convert the land to sustainable agriculture because forestry, according to NTFE, is no longer an economic use of the land.
- 3.2 NTFE has lodged three applications seeking change in land use and water takes, diversion, and discharge to enable it to use Balmoral for dairy farming, dairy support, cropping, and lamb and beef farming; with the conversion from forestry occurring over approximately 15 years.

The preferred "highly developed" proposal

- 3.3 The NTFE change in land use application as notified was for a highly developed dairy farm proposal. This was comprised of approximately 617 ha for dryland farming and up to 7,000 ha for irrigated dairy farming, with some 979 ha of Balmoral not grazed.
- 3.4 NTFE proposed the following:
 - (a) The diversion of up to 5.2 cumecs (m^3/s) of surface water from the Waiau River from the same location as the Amuri Irrigation Company Limited (AICL) diversion on the true right bank of the river just downstream of the Leslie Hills bridge at Topo50 BU24:8370-7367 (NZMS 260 N32:9370-3531);
 - (b) The take of up to 4.2 cumecs of surface water from the same site as the existing AICL take point located at the end of the settling pond at Topo50 BU24:8447-7263 (NZMS 260 N32:9447-3428);
 - (c) One cumec of water will be diverted from the Waiau River to operate the fish exclusion barrier and fish by-pass. This will be discharged back into the Waiau River at Topo50 BU24:8515-7231 (NZMS 260 N32:9515-3396) via the existing channel. The diversion and the discharge will only occur when AICL is not exercising its

consent to operate the fish screen and fish return;

- (d) The take and use of existing "A" permit water of those permit holders between Leslie Hills Bridge and the Waiau township bridge when it is available, with the remaining take being "B" permit water. (We note that during the hearing this was amended such that only A permit water held by AICL would be taken.) Water will be conveyed to Balmoral via an expanded and extended existing AICL canal to Balmoral. ;
 - (e) The water will be used to provide reliable irrigation of 5,035 ha out of a total of 7,000 ha of NTFE's property, plus up to 500 ha of additional irrigation that landowners adjoining the canal may require;
 - (f) Water will also be used for dairy shed wash-down and stock drinking water;
 - (g) A total annual volume of 60.4 million cubic metres for Balmoral was proposed, with 59 million cubic metres for irrigation and 0.86 million cubic metres for dairy shed wash-down and stock drinking water. (We note that this was amended during the hearing to 49 Mm³ for irrigation and 765,000 m³ for dairy shed wash-down and stock drinking water); and
 - (h) A land use consent to change the current use of land, being forestry, to a use which may result in the discharge of nitrogen or phosphorus at Balmoral Forest, which is an area of 8,596 ha. NTFE propose to use approximately 617 ha for dryland farming and up to 7000 ha for irrigated dairy farming. 979 ha of Balmoral will not be grazed.
 - (i) A consent duration of 35 years has been requested.
- 3.5 The location of NTFE's site, the proposed water takes, and proposed diversion points can be seen on the map below. Subsequently, we refer to the NTFE site as "Balmoral".



- 3.6 An important part of the preferred NTFE highly developed proposal is that NTFE intend to utilise part of the nutrient discharge load (60 tonnes), which has been allocated to HWP by a recent resource consent decision – which is under appeal. In particular, NTFE propose a nutrient discharge primary limit of 115 tonnes as measured at State Highway 1 based on what was 'apportioned' to Balmoral within the HWP resource consent decision (52 tonnes) and the quantity of HWP's nutrient discharge that NTFE considers it is able to use (63 tonnes) for land within the HWP command area.
- 3.7 To reflect NTFE's approach to nutrient discharge load recorded above, NTFE has divided Balmoral into two areas, known as Area A and Area B. Area A is 2580 ha inside the HWP command area and Area B is 3881 ha outside the HWP command area. The proposal limits discharge of nitrogen from Area A to 63 tonnes per year and Area B is limited to 52 tonnes per year.
- 3.8 To convey the water to Balmoral, NTFE propose to upgrade the existing AICL canal and infrastructure. To ensure a higher reliability of supply, NTFE will in the future construct storage dams on Balmoral. We do not have a resource consent application before us to extend the AICL canal and construction of dams for water storage and other related 'infrastructure' consents. We comment later on the impact on our deliberations of not having those consents before us.
- 3.9 For the sake of clarity, we note that the proposed site of the proposed diversion and take of water is the same location as the existing AICL diversion and take point at the Leslie Hills Bridge. NTFE propose to operate its diversion and take consents in conjunction with those operated by AICL. The diversion and discharge of water to operate the fish screen will only occur when AICL are not exercising its consents to operate the fish screen. The AICL consents are CRC951339 and CRC951309.

The reduced proposal – a 'sliding scale'

3.10 Notwithstanding NTFE's clear preference for the highly develop proposal, from the commencement of the hearing it became plain to NTFE that it required greater flexibility for the proposed change in land use, particularly if we were minded not to grant a change of land use for dairy farming.

3.11 NTFE contended that we had the ability to grant consent to dryland farming for all of Balmoral in the event that we decided not to grant consent to the highly developed proposal. We note in closing Ms Appleyard had this to say:

"However NTFE considers it implicit in the application that land use on Balmoral Forest will transition from forest land to dryland farming and subsequently to irrigated farmland. Therefore just dryland conversion was an option for Balmoral Forest – as there is a possible sliding scale of development on Balmoral for which land use can be granted. This scale of development ranges from 7,000 hectares of the 8956 ha being irrigated, to none of the 7,000 ha being irrigated, but the property still being fully developed/converted from forest to pasture. It is therefore open for the Commissioners to grant land use consent for any range of land use consent along this scale."

3.12 We discuss the scope to consider to adopt this approach later in our decision under the heading of preliminary issues. However, it is appropriate to note at this point that we allowed amendment to the application to increase the area for dryland farming beyond the 617 ha originally specified in the application.

3.13 So, we are considering a proposal that provides for a range of activities on a sliding scale of development. At the fully developed end of the range the change of land use would be dairying and irrigation as originally proposed over a maximum of 7,000 ha with 617 ha for dryland farming and 979 ha ungrazed. At the lower end of development the change of land use would provide for dryland farming of either all of the Balmoral site or perhaps a portion of it, subject to stocking rates.

3.14 The majority of the decision concentrates on assessing the highly developed dairy farm proposal because this leads to the greatest level of effects and raises the greatest challenge in terms of consistency of this type of development with the objective and policies of the HWRRP. In our view, the effects of a less developed dryland farming operation will be significantly less than the effects of a full dairy development.

NTFE farming operations

3.15 Mr Jansen provided detailed evidence on NTFE's proposal and its farming experience. He demonstrated NTFE's farming experience by referring us to the Eyrewell Forest conversion. We discuss this at this part of the decision as it reflects the type of conversion and farming operation that is intended for Balmoral.

3.16 He told us that since 2007 NTFE had been converting the forest land at Eyrewell to agricultural use. Since 2011 dairy farming had taken place on Eyrewell. In the 2014/15 dairy season he told us NTFE will be operating five dairy platforms managing all replacements and wintering of stock. He also told us of the awards NTFE had received for its Eyrewell operation.

3.17 During the course of the hearing we received evidence from Eyrewell farm managers, Mr and Mrs Back and Mr Andrew Clayton. They utilised a PowerPoint presentation to provide an overview of the Eyrewell operation.

3.18 Much of what they described was contained within the environmental management strategy that was attached to Mr Jansen's evidence as Appendix 1. What we found impressive was the breadth and scope of that strategy and the farming practices applied at Eyrewell.

3.19 Environmental effects associated with the take and use of water for irrigation were a focal

point of the environmental management strategy. It was clear to us that any environmental strategy had to meet and satisfy what was described as 'Ngai Tahu Farming agricultural sustainability protocols'. Those protocols were developed not only to meet better environmental outcomes, but developed and agreed to ensure that cultural values were upheld.

- 3.20 What we thought impressive was the utilisation and application of technology. For example, irrigation was described to us as being "*active irrigation*" utilising centre pivot irrigators with variable rate of irrigation technology. Irrigation water was applied in conjunction with, and after consideration of, inputs from soil moisture sensors related to each pivot, plus imports from automated weather stations, which provided data on soil temperature and water metering.
- 3.21 Combined with this technology were management information systems. NTFE stressed it had invested in Eyrewell, and intended to invest at Balmoral in the best available technology for supporting decisions and monitoring activities. For example, milk hub dairy systems were deployed at Eyrewell. These systems, we were told, are real time measurements of an individual cow's performance: measuring weight, milk yield, mastitis levels, and food intake. All relevant data on an individual cow's performance were collected and assessed, and the cow's needs were determined after an assessment of that detail.
- 3.22 In addition, IQ Irrigation Systems were also utilised at Eyrewell and intended for Balmoral. These systems provide online control of irrigation, application rates, water metering, and effluent and liquid fertiliser application through centre pivot irrigators. In short, this ensures that appropriate amounts of water and nutrients are applied at appropriate times and in appropriate locations. Effluent and liquid fertiliser is spread throughout the farming area so as to avoid concentrated releases of effluent in any one area.
- 3.23 We were also informed that at Eyrewell pasture measurement sensors are utilised on central pivots. These sensors measure and monitor pasture rate of growth.
- 3.24 Andrew Clayton explained that all farm operational data was captured within a "NTP data warehouse". This information was combined with actual financial data, plus forecasting data. This ensured that farming operations made efficient use of the water and pasture resource, and fertilisers and the like. The forecasting data was predictive in nature, in that it signalled future yields if certain farming practices were implemented. The actual financial data acted as a measuring point to determine whether the forecasts were met or not. If the forecasts were not met, then changes could be identified and undertaken.
- 3.25 The impression we were left with was that management of the current farming operations on Eyrewell was directed at ensuring continuous improvement in performance and utilisation of the management systems we have referred to.
- 3.26 Also, we were clear that Ngai Tahu's environmental and cultural values formed a key ingredient in day-to-day management of the farming operation at Eyrewell. This approach was also to be applied at Balmoral. The farm performance drivers and the strategies deployed to meet those drivers were comprehensive.²

4 NOTIFICATION, SUBMISSIONS AND HEARING

- 4.1 CRC132458 - to divert, take and use water and CRC142438 - to discharge water to water - were publicly notified on 19 October 2013 in the Christchurch Press, and the North Canterbury News on 22 October 2013.
- 4.2 CRC144606 - to change the use of land which may result in the discharge of nitrogen or phosphorus - was publicly notified on 22 February 2014 in the Christchurch Press, and in the North Canterbury News on 25 February 2014.

² Covering issues such as herd nutrition and health, milk quality, the genetic selection and breeding strategy, soil management and fertiliser regime, minimising nutrient losses, undertaking farm environmental risk assessments, and deploying agricultural sustainability and farm operating protocols.

- 4.3 A total of 102 submissions were received in respect of all three applications, with one submission in support, 53 in opposition and eight submissions in neither support nor opposition. The applications also received seven late submissions, of which six were granted a waiver of time on request.³ The seventh late submission was from Leslie Shand, whom the Commissioner requested appear on the first day of the hearing to be heard as to why the submission was late.⁴ On commencing the hearing NTFE withdrew any opposition to Leslie Shand's late submission. Consequently, her submission was allowed to be heard.
- 4.4 The hearing on all applications began on 5 May 2014 at 9.00 am and ran until 8 May 2014 in the Fern Room, The Atrium, at the Hagley Netball Courts. The hearing resumed at the same location in the week beginning 19 May 2014 through to Thursday 22 May. We reconvened on Friday 30 May at the same venue to hear the reply for NTFE.
- 4.5 At the reconvened hearing we received (presented as part of the reply) further expert evidence. We had directed that those materials be circulated to submitters before the right of reply was exercised. Unfortunately, that did not occur. Some submitters complained that this additional evidence exceeded the scope of matters in reply. Those submitters also provided to us a written response to what they saw was new evidence presented to us by NTFE experts.
- 4.6 We allowed the submitters' response. We also received a supplementary section 42A report. We allowed all parties until 27 June 2014 to address any of these final exchanges. We formally closed the hearing on Monday, 30 June 2014.
- 4.7 We attach as **Appendix 2** a list of persons, and their relevant organisations, who appeared before us at this hearing.
- 4.8 We record at this point NTFE requested that we issue separate consents for the divert, take, and use of water. These activities were notified together as one consent application, CRC132458. We address this request subsequently.

5 THE EXISTING ENVIRONMENT AND SITE VISIT

The existing environment

- 5.1 NTFE provided a full site description at sections 2.5 and 2.6 on page 9 and at section 5.1 on page 22 of the water take and use applications; and at sections 2.1 and 2.2 of the discharge application at page 4; and sections 2.1 and 2.2 of the land use application at page 6.
- 5.2 In relation to the Hurunui River, the mainstem from the AICL take point on the Hurunui River through to the mouth is of interest to us. Ms Burbidge in her s 42A report provided a description⁵ of the key features of the environment on the Hurunui River between the Hawarden Gorge and the mouth. She noted this stretch has a moderate to high recreational value for angling, moderate values for picnicking and jet-boating, and low values for camping, swimming, canoeing, rafting, hunting, and trail-biking.
- 5.3 It has, she says, low visual amenity value with the exception of the Hawarden Gorge and as the river travels through the Lowry Peaks Gorge. The river is a statutory acknowledgment area under the Ngāi Tahu Claims Settlement Act 1988. The Hurunui River adjacent to Balmoral is classified as an Alpine Upland River under the NRRP.
- 5.4 The Hurunui River between Hawarden Gorge and the mouth is a native bird habitat, a site of special wildlife significance, land of national significance, and contains wetlands of representative importance. Additionally, it is a salmonid habitat, provides habitat for longfin eel, torrentfish, koaro, Canterbury galaxias, upland bully, Chinook salmon, and brown trout.

³ 2nd minute of Commissioner Rogers dated 17 April 2014.

⁴ Ibid.

⁵ Daly A, 2004, Inventory of instream values for rivers and lakes of Canterbury New Zealand: A desktop review. Environment Canterbury. Report U04/13.

- 5.5 The Hurunui River is also used for human drinking water, with the Balmoral Recreation Area sourcing water from a well near the SH7 Bridge.
- 5.6 Balmoral is located adjacent to the Hurunui River. There are a number of river terraces located on the property. NTFE will provide a significant buffer distance between the site and the Hurunui River.
- 5.7 The Hurunui River has a number of tributaries which are referred to in our decision. The Mandamus River joins the Hurunui River immediately upstream of Balmoral, and the Waitohi River enters the Hurunui where SH7 crosses the river. Immediately below Balmoral a number of tributaries that drain the Amuri Plain enter the river. These include Dry Stream, the Pahau River and St Leonard's Drain. Water quality monitoring takes place primarily at the Mandamus confluence and at SH1.
- 5.8 Dr Kilroy summarised the water quality within the catchment. Water quality at Mandamus is good, with low nutrient concentrations. Progressing down the catchment the concentrations of nutrients increases. Nitrogen concentrations in particular increase 22 times, making the river at SH1 relatively high in nitrogen compared to other New Zealand rivers. Approximately half of the nitrogen input for the catchment comes from the Amuri Plain which is highly developed and irrigated. This nutrient load enters the river below Balmoral via the tributaries draining the Plain.
- 5.9 The river at SH1 has a relatively low phosphorous concentration compared to other New Zealand rivers. About 50% of the phosphorous input derives from the catchment above Mandamus, with about one third entering from the Amuri Plains tributaries.
- 5.10 We heard evidence from Mr Peter Callander about the depth and direction of groundwater flow beneath the site. There are relatively few wells on the property, but based on interpolated groundwater contours, groundwater beneath the site is relatively shallow, being between 5 m and 15 m below the surface. In Mr Callander's view, groundwater flows across the site, in an approximately west to east direction. It enters the river to the east of the site, generally between SH7 and the Dry Stream confluence.
- 5.11 Ms Marta Scott, ECan Groundwater Data Analyst, was generally in agreement with this description of groundwater movement, however commented that due to a lack of data from the site itself, an assessment of flow direction at a local scale could not be made.
- 5.12 While we accept there is a lack of groundwater data from the site, the description of the groundwater system proposed by Mr Callander appears reasonable, and given the lack of strong evidence for an alternative, we accept this description.
- 5.13 The Waiau River is described by Ms Burbidge as having moderate to high recreational values for jet boating and low visual amenity, with the exception of the Parnassus Gorge. It provides native bird habitat and is a wetland of representative importance and a site of special wildlife significance. It provides habitat for salmonids and native fish.
- 5.14 The point of take is located at the Leslie Hills Road Bridge, upstream of Mouse Point. ECan's flow measuring site is located upstream of the intake at Marble Point.

Site visit

- 5.15 The hearing panel conducted a site visit on 9 May 2014, accompanied by Edwin Jansen for Ngāi Tahu.
- 5.16 Prior to the site visit, the hearing panel asked submitters and NTFE for specific views or sites that should be included in the site visit. We received responses from NTFE, Whitewater New Zealand, and Fish & Game.
- 5.17 During the site visit we had plans detailing Balmoral, including pivot layout and maps of the general area, plus the listing of points of interest as identified by Whitewater New Zealand and Fish & Game.

- 5.18 We left Christchurch by helicopter and flew over the top of NTFE's Eyrewell property referred to earlier, located adjacent to the Waimakariri River. Then we continued to the AICL intake point on the Hurunui. We landed at the AICL structure, which we closely inspected with particular attention to the fish screens in place, gates, discharges, and sediment pools. We did this because the intake on the Waiau is similar in construction and operation.
- 5.19 From the AICL intake we drove from the Hurunui River and up the river terraces adjoining Balmoral to view the terraces and the deforesting activities occurring on Balmoral. Returning to the helicopter, we flew over Balmoral and followed the route of the Waiau River canal through to the take point for the NTFE proposal on the Waiau River, located on the Rutherfords' property.
- 5.20 We then flew down the Waiau River until it intersected with the Lowry Peaks range. We then flew across to the Hurunui River, following it downstream to its mouth.
- 5.21 We returned following the Hurunui River to Balmoral at SH7 and took a closer look at the recreation/camping ground and the surrounding well sites. We sighted the areas on the Hurunui that were identified by Whitewater New Zealand and Fish & Game.
- 5.22 We then left the application site, and flew back to Christchurch.

6 PLANNING FRAMEWORK

- 6.1 Overall, we found a good deal of consistency between NTFE and the Principal Section 42A Reporting officer, Adele Burbidge, as to the identification of the relevant planning framework. However, there were differences between NTFE (primarily, Dr Brent Cowie and Ms Appleyard) and Ms Burbidge relating to the application of the plans and their provisions to this application.
- 6.2 In this section, so as to provide some context to what follows, we identify what we considered are the relevant Policy Statements, Regulations, Standards, and Plans. Where appropriate in this part of the decision we will resolve the differences between Dr Cowie and Ms Appleyard for NTFE and Ms Burbidge - relating primarily to status of the activities. However, in the main, discussion about the provisions of the Plans and how the NTFE proposal sits alongside them comes later in this decision.

National Policy Statement Freshwater Management 2011 (NPS)

- 6.3 The NPS sets out objectives and policies to manage water in an integrated and sustainable way, while providing for economic growth within set limits.
- 6.4 The NPS addresses water quality, water quantity, integrated management, tangata whenua⁶ roles and interests, and finally implementation. As we read the NPS, it directs regional councils to primarily ensure that regional plans meet the objectives set within the NPS.
- 6.5 We note that Mr Anderson (legal counsel for Forest and Bird, a submitter in opposition to the NTFE application) contended that granting consent to the NTFE proposal would not be consistent with the NPS. He also developed arguments based on his interpretation and application of the recent Supreme Court decision in *Environmental Defence Society v The New Zealand King Salmon Co Ltd.*⁷ We discuss these submission points and others made by Mr Anderson later in this decision.
- 6.6 On the other hand, Dr Cowie contended that the operative HWRRP implicitly gives effect to the requirements of the NPS to set long-term objectives and limits for both water quality and environmental flows in the Waiau and Hurunui Rivers. He also considered granting the NTFE proposal was consistent with the relevant provisions of the Freshwater NPS, in particular Objective A1. Mr Anderson disagreed. We will discuss this disagreement later.

⁶ (Noun) local people, hosts, indigenous people of the land. <http://www.maoridictionary.co.nz/>

⁷ (2014) NZSC 38.

National environmental standards and regulations

The Resource Management (National Environmental Standards for Sources of Human Drinking Water) Regulations 2007 (NES Drinking Water)

- 6.7 The issue here was whether or not there were any drinking-water supply wells that would be affected by the NTFE proposal in a manner relevant to the regulations. Ms Burbidge considered that the drinking-water well located within the Balmoral recreation area met the criteria provided for within Section 11 of the Standard.
- 6.8 Dr Brent Cowie for NTFE did not agree. He considered that Section 11 requires that the well serve at least 25 people for at least 60 days per year. While he acknowledged that the Balmoral recreation reserve was well utilised by persons during holiday periods, he doubted that this heavy usage would carry on outside holidays. In any event, if the NTFE proposal is consented, NTFE proposed to monitor water quality in that well and to provide an alternative water source should nitrate-nitrogen or *E. coli* contamination occur. They considered this satisfies the Regulations. We agree. We have included a condition to this effect.⁸
- 6.9 Dr Alistair Humphrey provided evidence in support of a submission by Community and Public Health (being a division of the Canterbury District Health Board) in relation to community drinking-water supplies, which he considered may be affected by the land use changes proposed by in NTFE. He also referred to the Drinking Water Standards for New Zealand. He considered it would be very difficult for the relevant communities to demonstrate that they are effectively managing all public health risks as required by the Standards. We will return to this issue later when we discuss effects of the NTFE proposal.

Resource Management (Measurement and Reporting Water Takes) Regulations 2010

- 6.10 In short, these Regulations require measurement of takes that exceed 5 L per second. NTFE has proposed conditions to measure the instantaneous and total annual take from the Waiau River and the volume of water used annually for each use (mainly irrigation, stock water, and dairy shed wash down purposes). NTFE considers that it will comply with the Regulations with these conditions in place. We agree.

Canterbury Regional Policy Statement

- 6.11 The Canterbury Regional Policy Statement (the RPS) became operative on 15 January 2013. Chapter 7 is the relevant chapter. That chapter contains objectives and policies relevant to both the taking of water from the Waiau River and the related proposed change of land use, which is a key part of the NTFE proposal.
- 6.12 Dr Cowie for NTFE identified Objectives 7.2.1, 7.2.2, 7.2.4, and Policy 7.3.4 as relevant to the take and use of water. The key point he made was that all of the matters covered in the objective and policies referred to are embodied into the operative HWRRP. He demonstrated this by referring to the overlap between the objective and policy base of the HWRRP and the RPS. We agree with him.

Natural Resources Regional Plan (NRRP)

- 6.13 Dr Cowie and Ms Appleyard (legal counsel for NTFE) submitted that the NRRP was of no relevance to the NTFE proposal. This was because none of the applications were lodged under the NRRP. Ms Burbidge in her principal report acknowledges that because the change of land use consent was lodged under the operative HWRRP there is no need to assess the change of land use activity against the NRRP. We agree with that.
- 6.14 In terms of the take from the Waiau River, this application was lodged when the HWRRP was a proposed plan. Ms Burbidge concludes that it is appropriate to consider the allocation regime provided for in the NRRP. However, the NRRP does not contain a specific allocation regime for the Hurunui and Waiau catchments. Rather, it has a generic approach

⁸ Condition 23 of CRC 144606.

to allocation established pursuant to Policy WQN 13.1.

- 6.15 In the end, because the proposed HWRRP contains a specific flow and allocation regime for the Waiau River, Ms Burbidge concluded it was more appropriate that we consider this part of the NTFE proposal, i.e., the water take, against the proposed HWRRP rather than the NRRP. We agree that the NRRP is not relevant to our considerations for any part of NTFE proposal, except in relation to the activity status of those applications lodged while it was operative.

Proposed Hurunui and Waiau River Regional Plan Decisions version and Operative version

- 6.16 Due to the timing of lodgement of applications, various versions of the HWRRP are, in a technical sense, relevant.
- 6.17 However, primarily because classification or status of the various activities did not change under various versions of the HWRRP, it is accepted by Ms Burbidge and NTFE that the HWRRP operative version is the most important plan we need consider. The HWRRP is the most relevant plan in relation to the application to take and use water, the applications to divert and discharge water to water, and finally the change of land use application.
- 6.18 We accept NTFE's submission that for the purpose of assessing activity status we need to assess the NTFE proposal against the version of the HWRRP rules that applied at the time each application was made. We apply this approach in our next section when we consider activity status. To determine activity status we refer to the HWRRP rules that applied at the time the application was lodged. By the use of footnotes we identify the current relevant rules in the operative HWRRP. We also agree that in terms of objectives and policies, it is the version of those objectives and policies as contained in the operative HWRRP that are relevant to our considerations.

Activity status

- 6.19 There were different points of view between NTFE and Ms Burbidge about the status of the various activities under the operative HWRRP. Over the course of the hearing and within legal submissions, evidence, and supplementary reports from Ms Burbidge, arguments and reasons were advanced by both NTFE and the reporting officers around the status issue.

Change of land use

- 6.20 Starting with the proposed change of land use, Ms Appleyard submitted that the word "*and*" within Condition (b) of Rule 10.2 should be given a conjunctive use. In context of Condition (b) this means only one of the load limits at State Highway 1 of either dissolved inorganic nitrogen or dissolved reactive phosphorus would need to be met. She submitted because only the dissolved reactive phosphorus is being breached at State Highway 1, that the condition can be met and the activity is not a non-complying activity, rather it is a permitted one.
- 6.21 Ms Burbidge does not accept that the word "*and*" should be treated as an "*or*", particularly when the context of the HWRRP is considered. She says the clear intent of the HWRRP is to provide that if either the phosphorus and nitrogen limits are exceeded the activity status becomes non-complying. Any other result, she said, would lead to a perverse outcome given the intent of the HWRRP.
- 6.22 Toward the conclusion of hearing evidence we sought a legal opinion from Ms Dysart of CRC on the interpretation of Rule 10.2 and the word "*and*" as it appears within that rule. A copy of that legal opinion was provided to all participants for their consideration and response.
- 6.23 Ms Dysart reaches the conclusion that the limits for each nutrient within the HWRRP are a matter of concern. The opinion notes limits for each have been set to achieve the objectives of the HWRRP. Further, nitrogen and phosphorus levels are independently controlled because they have both different, as well as synergistic, effects.

- 6.24 Importantly, Ms Dysart’s opinion considers the consequences given the water quality objectives expressed within the HWRRP if NTFE’s submissions on Rule 10.2(b) (on the word “and”) are accepted. If an activity that would exceed one of the nutrient load limits were to be a permitted activity, then that activity has the potential to exacerbate the exceedance of a catchment nutrient load limit. Furthermore, no conditions could be attached to such a permitted activity. Conversely if “and” is to be read as “or” and consent is required, then conditions can be attached tailored for the location and specifics of the activity.
- 6.25 In her memoranda in response dated 27 June 2014, Ms Appleyard did not agree with Ms Dysart’s legal opinion. She rejected it on the basis that the objectives and policies within the HWRRP are not sufficient or direct enough to read in an interpretation of a rule that is simply not available on the plain ordinary meaning of the words in that rule. She also contended that Ms Dysart had not demonstrated that applying NTFE’s interpretation would reach the very high test of being an “*absurd*” interpretation as required by the relevant case law.
- 6.26 Ms Appleyard also critiqued the HWRRP decision and referred to various paragraphs in support of the argument that the decision-maker’s intention was that non-complying activity status was only triggered when both limits nitrogen and phosphorous were exceeded, not just one.
- 6.27 In our view, the conjunctive interpretation leads to an outcome which cuts directly across what we see as the purpose of the HWRRP. We agree with Ms Dysart’s legal opinion when she reflects that such an interpretation does not implement the policies or achieve the objectives of the HWRRP.
- 6.28 In the context of interpreting and applying the HWRRP, we think this then leads to an “*absurd*” outcome of the kind referred to by the House of Lords in *Federal Steam Navigation Co Limited v The Department of Trade and Industry*.⁹
- 6.29 We observe that NTFE’s legal submissions note that Policy 5.3B HWRRP provides for a land use change only when that change will not result in a breach of the water quality limits set out in Policies 5.3 and 5.3 A and will not breach the nitrogen load limits set in Schedule 1. We saw this as acknowledging that while the wording of Rule 10.2(b) was not ideal, there was a clear objective and policy position that required very careful consideration of both nitrogen and phosphorus.
- 6.30 For the reasons advanced, we prefer the views expressed by Ms Burbidge in her section 42A report and the views expressed by Ms Dysart in her legal opinion dated 10 June 2014. This results in our finding that the word “and” as it appears in Rule 10.2(b) is to be read and applied as an “or”.
- 6.31 Consequently, it is our view that if either the nutrient discharge loading or the dissolved reactive phosphorus loading in the Hurunui catchment has reached its limit under Schedule 1, then the change in land use activity is classed as non-complying, which is the status we give to the change in land use application by NTFE.
- 6.32 We acknowledge the legal opinion provided to us by Mr Anderson, legal counsel for Forest & Bird. His reasoning is similar to that relied upon by Ms Dysart. Given the conclusions we have already reached on this point, we need not take his opinion any further.
- 6.33 We conclude then that the change in the land use (s 9) on Balmoral Forest is non-complying pursuant to Rule 11.1 A of the HWRRP.

Take, use, divert and discharge of water

- 6.34 We now turn to the proposed take, use, diversion, and discharge of water to and from the Waiau River. In her original report Ms Burbidge was of the view that this activity was non-complying for the following reasons:

⁹ [1974] 1 WLR 505 (HL).

- (a) The allocated water from the B permit allocation block would result in less than six cumecs of water being taken below Stanton (Condition (b) of Rule 2.3).
 - (b) Fish would not be prevented from entering the diversion intake (Condition (f)¹⁰ of Rule 2.3)
 - (c) The annual volume proposed did not meet Condition (h)¹¹ of Rule 2.3.
- 6.35 In relation to her concern that there would be less than six cumecs of water available to be taken below Stanton, Ms Burbidge subsequently confirmed she was in error on this point. We accept that Dr Cowie and Ms Appleyard are correct on this point.
- 6.36 In relation to the fish screen, it was accepted by NTFE that the existing fish screen does not meet the now relevant standards. Dr Cowie and Ms Appleyard sought to style the circumstance as a 'technical non-compliance'. They suggested that this concern would be addressed by NTFE as soon as the take exceeded 1000 L per second. However, we agree with Ms Burbidge that when water is taken, irrespective of the volume of water taken, if Condition (f)¹² as it then was of Rule 2.3 cannot be met, then the status of the activity is non-complying under Rule 4.2 of the HWRRP.
- 6.37 Finally, in relation to the issue of annual volume and efficient and reasonable use of the water, we have considered Condition (h) (as it then was).¹³ Ms Burbidge contends that the 59 Mm³ is greater than required for a reasonable use in nine out of ten years. She relied upon the evidence of Mr Borrie for this view and she maintained that position consistently throughout.
- 6.38 Ms Appleyard for NTFE argued that the efficient and reasonable use of water needs to be considered after proper regard has been given to whether or not storage of water is proposed. It was her view (based on the evidence of Mr Andrew Brough) that the proposed annual volume was reasonable in the circumstances, particularly when considering the need for storage. Therefore, she said, the annual volume should not be considered to be in breach of Condition (h).
- 6.39 However, Mr Brough subsequently undertook further MATLAB modelling to address both the annual volume issue and also to address a concern raised by HWP regarding the daily application rate of water, where HWP considered it should not exceed 0.64 L/s rather than 0.8 L/s previously relied on by NTFE. Mr Brough in his supplementary evidence referred us to an annual volume condition setting an annual volume for irrigation at 49 Mm³. He considered that this was sufficiently close to Mr Borrie's calculation of 46.7 Mm³ to satisfy Condition (h).
- 6.40 While we accept that the difference in calculations between Mr Brough and Mr Borrie reduced as the hearing progressed, we remain of the view that Mr Borrie's calculation is the more accurate and appropriate, leading to the conclusion that the status of the activity is non-complying.
- 6.41 We conclude that the take, use, divert and discharge of water in relation to the Waiau River fails to meet Conditions (f) and (h) of Rule 2.3. Therefore, under Rule 4.2 the status of these activities becomes non-complying.

Bundling of consents

- 6.42 NTFE resists the standard approach to bundling. That approach provides that where multiple consent applications are in play, they are bundled and assessed based on the most stringent activity status. NTFE says to do so would skew consideration of the entire NTFE proposal inappropriately.

¹⁰ now condition (e).

¹¹ now condition (g).

¹² now condition (e).

¹³ now condition (g).

- 6.43 NTFE consider the consents should be bundled in a different way. It submits that the land use and use of water on Balmoral Forest should be bundled together as non-complying activities under Rule 11.1 A (if we do not accept NTFE argument about the interpretation of the word "and" as it appears in Rule 10.2 of the HWRRP). Also, the applications to divert and take and discharge Waiau River water should be bundled together and treated as restricted discretionary activities under Rule 2.3 of the HWRRP.
- 6.44 However, given the finding we have made about both the change of land use consents and the Waiau River consents - mainly that we conclude they are non-complying - then there is little benefit in adopting the bundling approach that Ms Appleyard proposes. We have therefore proceeded to approach all of the consents before us on the basis that the appropriate status or classification is non-complying.

7 STATUTORY CONSIDERATIONS

Sections 9, 13, 14 and 15 RMA – duties and restrictions

- 7.1 Part 3 RMA sets out duties and restrictions on activities, including the following sections that are particularly relevant to these applications:
- 7.2 **Section 9** - restrictions on the use of land. This includes activities such as applying water as irrigation water onto land.
- 7.3 **Section 14** – restrictions on the damming, diverting, taking and using of water. This includes activities such as taking water from rivers and lakes for use in irrigation.
- 7.4 **Section 15** – restrictions on the discharge of contaminants into the environment. This includes activities such as discharging surplus irrigation water back into rivers and lakes.
- 7.5 The general principle under all of the above sections is that consent is required for these activities unless the activity is expressly permitted by a relevant regional plan or valid resource consent.¹⁴ The activities that are the subject of these applications do not meet these exceptions, and resource consent is therefore required pursuant to Sections 9, 14 and 15 RMA.

Sections 104, 104B and 104D RMA – consideration of applications

- 7.6 Section 104(1) RMA sets out the matters we must have regard to in our consideration of the applications. The relevant matters are as follows:

- "(a) any actual and potential effects on the environment of allowing the activity; and*
- (b) any relevant provisions of –*
 - (i) a national environmental standard:*
 - (ii) other regulations:*
 - (iii) a national policy statement:*
 - (iv) a New Zealand coastal policy statement:*
 - (v) a regional policy statement or proposed regional policy statement:*
 - (vi) a plan or proposed plan; and*
- (c) any other matter the consent authority considers relevant and reasonably necessary to determine the application.*

¹⁴ There are some exceptions to this, such as taking water for stock water and domestic use under s 14(3)(b). The issue of stock water is discussed later in this decision.

- 7.7 The balance of s 104 RMA contains a range of other matters that may also be relevant to our consideration, including the following (among others):
- (a) Section 104(2) – Provides us with the discretion to disregard an adverse effect on the environment if the plan permits an activity with that effect (the permitted baseline).
 - (b) Sections 104(6) and (7) – Provides that we may decline a consent on the grounds of inadequate information, taking into account any requests for further information that have been made.
- 7.8 We note Section 104(1) RMA provides that the matters therein listed are subject to Part 2 RMA, which includes Sections 5 through to 8, inclusive. We consider Part 2 RMA matters subsequently.
- 7.9 For non-complying activities, the same requirements of s 104(1) apply. In addition, s 104D RMA contains particular restrictions for non-complying activities and provides:
- "(1) Despite any decision made for the purpose of [section 95A(2)(a) in relation to adverse effects], a consent authority may grant a resource consent for a Non-Complying Activity only if it is satisfied that either –*
- (a) the adverse effects of the activity on the environment (other than any effect to which [section 104(3)(a)(ii)] applies) will be **minor** [emphasis added]; or*
 - (b) the application is for an activity that will not be **contrary** [emphasis added] to the objectives and policies of –*
 - (i) the relevant plan, if there is a plan but no proposed plan in respect of the activity; or*
 - (ii) the relevant proposed plan, if there is a proposed plan but no relevant plan in respect of the activity; or*
 - (iii) both the relevant plan and the relevant proposed plan, if there is both a plan and proposed plan in respect of the activity.*
- (2) To avoid doubt, section 104(2) applies to the determination of an application for a Non-Complying Activity."*
- 7.10 In considering whether an effect on the environment is "*minor*", minor means lesser or comparatively small in size or importance, and the judgement is to be made considering the adverse effects as a whole. In relation to the second jurisdictional hurdle, the word "*contrary*" is given a meaning of more than just non-complying, but opposed to in nature, different to, or opposite. We are required to consider whether the proposed activity would be contrary (in that sense) to the objectives and policies of the HWRRP in an overall consideration of the purpose and scheme of the plan.
- 7.11 Based on the above, the process we will follow when considering a non-complying activity is to:
- (a) identify the relevant s 104 matters;
 - (b) consider whether the jurisdictional hurdles in s 104D are met having regard to the relevant, and rejecting irrelevant, matters under s 104; and
 - (c) if either one of the jurisdictional hurdles is passed, weigh the relevant matters under s 104 and Part 2 as part of the overall discretion whether or not to grant consent under s 104B.
- 7.12 In accordance with s 104B, after considering such applications we may grant or decline consent. We must exercise that discretion having proper regard to the purpose of the RMA,

which requires a balancing exercise of the various elements identified in the course of the hearing – particularly under s 104 and Part 2 RMA. If we grant the application, we may impose conditions under s 108.

- 7.13 Mr Anderson, in his legal submissions for the Royal New Zealand Forest and Bird Protection Society Incorporated (Forest & Bird) and in reliance on the recent Supreme Court decision *Environmental Defence Society v The New Zealand King Salmon Company Limited*¹⁵, submitted there was now to be a new approach to the assessment of plan documents and a move away from what has become known as an 'overall broad judgement approach'.
- 7.14 He refined his submissions to focus on s 104(1)(b) RMA. In that, where objectives and policies that are directive are in play then a decision-maker has no choice but to implement them. As we understood it, Mr Anderson said this Supreme Court decision was to the effect that such directive objectives and policies could not be diluted or off-set by the 'overall broad judgement approach'.
- 7.15 Ms Appleyard within her reply sought to distinguish the *King Salmon* decision. Firstly, she submitted its application was restricted to its facts and planning context. The decision related to a plan change and the interpretation of the New Zealand Coastal Policy Statement. The second distinguishing point was the New Zealand Coastal Policy Statement contained directive "avoid" policies which were, she said, much more directive than the objectives and policies of the relevant HWRRP. The HWRRP policies sought an outcome of protection but did provide also for expansion of irrigation *only* when certain outcomes relating to nutrients could be met.
- 7.16 In our view, *King Salmon* could very well be restricted in its application to its own particular set of facts, including the planning context, namely a plan change in which *King Salmon* was determined. *King Salmon* is we think a timely reminder that objectives and policies should be applied in any given factual context after carefully considering the words used in those objectives and policies and the intended outcomes emerging from those words. In particular, if a policy is directive, then in our view, it should not be 'watered down' by the misapplication of a balancing exercise. This is because objectives and policies in plans which have been arrived at after a hearing process that enables all interested parties to present their views for consideration reflecting the environmental outcomes sought by them. So, a directive policy should be given full force and effect.
- 7.17 This is the approach we will apply when considering and applying the objectives and policies, in particular of the HWRRP. So, for the reasons given, to the extent it may be relevant, we think we are acting in accord with the *King Salmon* decision when we identify the most relevant objectives and policies and give them a weighting driven by the factual context of the application before us.
- 7.18 It is clear from the above that all relevant issues must be considered when deciding whether or not to grant consent. This includes all potential effects on the environment and consideration of the relevant provisions of the various planning instruments discussed further below. Our consideration is not limited by the reason why consent is required (i.e. the particular rule which triggers consent). However, this may be of some relevance in evaluating the significance of the different issues arising from a particular proposal.

Section 105 RMA – discharges

- 7.19 In addition to the matters specified in s 104 RMA, for the application for a discharge permit we must also have regard to the following matters under s 105(1) RMA:
- (a) The nature of the discharge and the sensitivity of the receiving environment to adverse effects;
 - (b) NTFE's reasons for the proposed choice; and
 - (c) Any possible alternative methods of discharge, including discharge into any other

¹⁵ [2014] NZSC 40.

receiving environments.

- 7.20 We have had regard to these matters when we consider the discharge application, which we do within our Section 12: Instream values of the Waiau River.
- 7.21 The discharge is water into water, and therefore it is unlikely that any additional contaminants will enter the diverted water. Ms Burbidge considers that NTFE's proposal is appropriate for the receiving environment. The method of discharge reduces potential effects on the Waiau River by utilising existing infrastructure. We observe the discharge will be no more than what is currently authorised by the discharge permit held by AICL, as the two consents will not operate concurrently.

Section 107 RMA

- 7.22 Section 107 RMA is also relevant to the discharge consent. This section sets out a number of restrictions on the granting of certain discharge permits. In summary form, the effects of the discharge should not give rise to a range of effects in the receiving waters.¹⁶
- 7.23 The discharge of bypass water is simply water that is diverted from the river. Therefore, in our view, none of the circumstances listed in sub-sections (c) – (g) will arise in relation to the discharge of fish bypass water.

Part 2 matters RMA

- 7.24 Section 104(1) RMA states that our consideration of the applications is subject to Part 2 RMA, which covers ss 5 – 8, inclusive. We record that our approach is that ss 6, 7 and 8 contribute to, and will inform, our evaluation under s 5 RMA.
- 7.25 The overall purpose RMA is "*to promote the sustainable management of natural and physical resources*". In turn, "*sustainable management*" means:
- "... managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety while –*
- (a) Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*
 - (b) Safeguarding the life-supporting capacity of air, water, soil and ecosystems; and*
 - (c) Avoiding, remedying, or mitigating any adverse effects of activities on the environment".*
- 7.26 Sections 6 identifies the following matters of national importance that we must "*recognise and provide for*" when making our decision:
- "(a) The preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use and development.*
 - (b) The protection of outstanding natural features and landscapes from inappropriate subdivision, use and development;*
 - (c) The protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna;*
 - (d) The maintenance and enhancement of public access to and along the coastal marine area, lakes and rivers;*

¹⁶ Including such matters as: the production of conspicuous oil or grease films, changes in colour or visual clarity, emission of objectionable odour, rendering fresh water unsuitable for farm animal consumption, and any significant adverse effects on aquatic life.

- (e) *The relationship of Māori and their culture and traditions with their ancestral lands, water, sites, wāhi tapu, and other taonga;*
- (f) *The protection of historic heritage from inappropriate subdivision, use and development.*

7.27 Section 7 list the following other matters that we shall “*have particular regard to*”:

- (a) *Kaitiakitanga:*
- (aa) *The ethic of stewardship:*
- (b) *The efficient use and development of natural and physical resources:*
- (ba) *The efficiency of the end use of energy:*
- (c) *The maintenance and enhancement of amenity values:*
- (d) *Intrinsic values of ecosystems:*
- (e) *Repealed.*
- (f) *Maintenance and enhancement of the quality of the environment:*
- (g) *Any finite characteristics of natural and physical resources:*
- (h) *The protection of the habitat of trout and salmon:*
- (i) *The effects of climate change:*
- (j) *The benefits to be derived from the use and development of renewable energy.*

7.28 Finally, section 8 requires that we shall take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi).

7.29 We have carefully considered the purpose and principles of the RMA as part of our evaluation of the NTFE proposal and return to the relevant provisions at the end of this decision.

8 PROCEDURAL AND PRELIMINARY ISSUES

Late submissions

8.1 While late submissions are typically a procedural matter, we have already dealt with them earlier in our decision.

Potential conflict of interest

8.2 On 12 May 2014, the hearing panel was alerted to a perceived potential conflict of interest issue by Mr Hamblett, a submitter, regarding Commissioner Ms Couch-Lewis’s involvement with this hearing. Subsequently, Forest & Bird, Fish & Game, Whitewater New Zealand, and (later) Rosalie Snoyink, all raised concerns about Commissioner Couch-Lewis’s independence.

8.3 On the first day of the hearing the Commissioner panel were introduced to the participants present. Brief background details were provided to the hearing participants. Relevantly for Commissioner Couch-Lewis, participants were informed she was of Ngāi Tahu, residing at Rāpaki.

8.4 Also, Ms Appleyard, in her opening submissions, provided an overview of Te Runanga O Ngāi Tahu and its subsidiaries. She explained that NTFE is a subsidiary of Ngāi Tahu

Property Limited (NTPL). NTPL is a wholly owned subsidiary of Ngāi Tahu Holdings Corporation, which in turn holds and manages commercial investments for the benefit of Te Runanga O Ngāi Tahu.

- 8.5 Te Runanga O Ngāi Tahu is the governing tribal Council established by statute and is recognised as the representative of Ngāi Tahu Whanui. Commissioner Couch-Lewis is a member of Ngāi Tahu Whanui.
- 8.6 Submitters initially raised queries seeking more information relating to Commissioner Couch-Lewis and her relationship with Ngāi Tahu and, in turn, a better understanding of the linkage, if any, between NTFE and Commissioner Couch-Lewis as a Ngāi Tahu member. Their concern evolved into a question as to whether or not Commissioner Couch-Lewis, through her relationship and/or membership of Ngāi Tahu, would receive any benefit, direct or indirect, as a result of NTFE gaining consent and thereafter successfully operating.
- 8.7 Some information about Commissioner Couch-Lewis and her role within Ngāi Tahu, along with information about the operations of Ngāi Tahu, was gathered and distributed by the Chair in the form of a memo to the submitters who were expressing concern. After that information was provided, the hearings panel asked the submitters as to whether or not they still held concerns about this matter of potential conflict. They confirmed they did. The submitters were provided with an opportunity to clearly articulate those concerns to us. NTFE and any other participants were also invited to raise any concerns or to be heard on this issue of potential conflict.
- 8.8 NTFE made it plain that it would abide the decision of the panel on this issue of conflict. The submitters were duly heard. Essentially, because Commissioner Couch-Lewis was a member of Ngāi Tahu and because NTFE was part of the commercial arm of Ngāi Tahu, the submitters considered that there was a real possibility of conflict and bias.
- 8.9 The hearings panel had already been considering this very important issue as information came to hand. After hearing from the submitter group, the hearings panel adjourned to consider the position.
- 8.10 Utilising the standpoint of the well-informed lay observer and after considering the information that been gathered and the views expressed by the submitters, the hearings panel reached the view that a well-informed lay observer might reasonably apprehend that because of the connections we have referred to, Commissioner Couch-Lewis may be seen as not being able to bring an impartial mind to the resolution of this application before us. There was a very real risk if Commissioner Couch-Lewis remained on the hearings panel that a perception of bias could exist.
- 8.11 Taking into account all of the matters raised by the submitter group and paying careful attention to the importance of ensuring the hearings process is conducted in a manner which is fair and reasonable to all participants and that protects the integrity of the process, the decision was made to direct Commissioner Couch-Lewis to stand down from the hearings panel. She did so.
- 8.12 The remaining Commissioners, Paul Rogers (as Chair) and Emma Christmas, wish to stress this unfortunate event had nothing to do with the conduct of Commissioner Couch-Lewis either in preparation for, or during the course of, the hearing. In our view, she displayed a very strong skill set and conducted herself in an exemplary way. She certainly impressed us with her skill set in relation to tikanga Māori matters.
- 8.13 Before we decided to continue with the hearing we also determined that we had before us sufficient expert evidence to assist us in considering any matters related to tikanga Māori. Principally because we had expert evidence from Gina Solomon representing Te Runanga O Kaikoura, we considered it appropriate to proceed.

Scope of the application

- 8.14 On the first day of the hearing a question arose as to whether or not NTFE had applied to change land use on the proposed site irrespective of whether the proposed site was

irrigated. This turned upon an interpretation of the land use application and public notification.

- 8.15 Dr Cowie contended it was clear from both the application and the public notification that the NTFE proposal was to use Balmoral for approximately 617 ha of dryland farming and up to 7000 ha of irrigated dairy farming. So he contended it was clear that less than 7000 ha may be irrigated. He noted the land use had been sought for all of Balmoral (some 8596 ha) on the basis that land use change, whatever that may be, would encompass all of Balmoral and not just the area that NTFE sought to irrigate.
- 8.16 Dr Cowie contended that because the assessments assumed full development of Balmoral as a dairying proposal, it naturally followed that if less development such as dryland farming occurred there would be fewer potential effects. In support of this argument Dr Cowie referred us to page 10 of the AEE for the land use change consent. There he noted that the assessment of effects included, but was not limited to, assessing effects if less development were undertaken by utilisation of lower stocking rates and other options. In this way, he said, the application provided for a range of development options: from limited development (such as conversion to dryland farming) right through to fully developed dairying operations over all of the irrigable area of Balmoral.
- 8.17 Ms Burbidge within her supplementary s 42A report made comment on Ms Appleyard's submissions and Dr Cowie's evidence. Specifically, she addressed the concern that if consent could not be granted to irrigate the entire 7000 ha, did the application seek as an alternative conversion of a reduced development to dryland farming?
- 8.18 It was Ms Burbidge's view the application did not specifically request conversion to dryland farming if consent cannot be granted for the irrigation of the full 7000 ha.
- 8.19 However, Ms Burbidge did acknowledge that there was evidence available to us to consider the effects of granting a reduced development to dryland farming as opposed to the full irrigation development. She referred to what became known as the 'revised table' in Mr Jansen's evidence.
- 8.20 In considering that evidence, Ms Burbidge provided her clear view that the effects of granting dryland farming (as opposed to full irrigation development) would be less.
- 8.21 Regarding scope, Ms Appleyard accepted that it was not necessarily explicit within the application that NTFE was seeking the alternative pathway of a grant of consent for a dryland conversion of Balmoral Forest only if consent to irrigate was declined.
- 8.22 Ms Appleyard elaborated on this point by submitting that it was implicit in the application that land use on Balmoral Forest will transition from forest land to dryland farming (and subsequently) to irrigated farmland. It was her view therefore that just dryland conversion was an option for Balmoral forest. She contended the application provided for a sliding scale of development on Balmoral for which land use consent can be granted. In a similar fashion to what Dr Cowie said, she contended that the scale of development ranges from a fully developed 7000 ha irrigated dairy operation, to none of the 7000 ha being irrigated, but Balmoral still being developed albeit at a reduced level of development involving conversion from forestry to pasture for dryland farming.
- 8.23 Ms Appleyard reminded us that NTFE requires land use consent even for conversion from forest to dryland farming, given that that change would trigger the change of land use provisions within the HWRRP.
- 8.24 Ms Appleyard referred us to what she described as well-established case law to the effect that amendments to resource consent applications are permissible provided they are within the scope defined by the original location. She set out for us the tests contained within that case law. In short, modification will be allowed dependent on whether or not it results in the application being materially or significantly different in its scope or ambit from that which was originally applied for and notified. This involves analysis of the facts specific to the case and would include consideration of the environmental impacts of the proposed amendments. Finally, we must consider whether or not there is any prejudice to parties

and the general public as a result of the modification.

- 8.25 When reading and considering the application, the AEE and the notification in combination, dryland farming as an alternative to full dairy conversion over the entire site is not explicitly stated. Rather on the face of the application there is a limit to dryland farming of 617 ha. So, on the face of it, seeking land use consent to change from forestry to dryland farming (over either the entire site or that part of it for which irrigation consent is not available) is not clearly raised within the application.
- 8.26 However, we do agree an amendment to the application is available to NTFE to provide for a range of development, with 7000 ha of irrigated land for dairy farming being at the top end or highly developed end of the range, with dryland farming being at the lesser or reduced development end of the range.
- 8.27 If the application is to be amended in this way, we agree with the opinion of Dr Cowie that there would be no prejudice to submitters. We agree also with the submissions of Ms Appleyard in that regard. We accept that submitters have concerns about the large scale nature of NTFE's proposed dairy farming operation on the site. If this is correct, then we agree it is difficult to see how *reducing* the scale of the operation would result in new submitters. Thus we accept there is no prejudice to any party from the amendment to the application.
- 8.28 To conclude on this point, while the application as drafted is unclear in providing for a sliding scale of development, we agree it is open to NTFE to amend the application in the manner they have. We are comfortable considering the application as amended to provide for a range of activities on Balmoral, the higher end of which would be irrigation and dairying on 7000 ha (which we will call the highly developed proposal) and at the lower end (which we will call the reduced development) would be extensive dryland farming.
- 8.29 During the course of the hearing we reminded NTFE that notwithstanding we accepted that we could consider a reduced proposal as described above, we needed greater detail supporting the effects assessment of the nutrient discharge outputs of any such proposal. This evidence was provided to us toward the end of the hearing through the supplementary evidence of Mr Jansen and Ms Appleyard's reply. This evidence took the form of a table that provided a possible dryland farming system of beef finishing and dairy support and detailing the nutrient output for this system.
- 8.30 We understand from Ms Appleyard's reply that the example given of a possible dryland farming system was simply an example. We note her example is of a fairly intensive dryland farming operation, and we bear in mind that the range of potential land uses we are considering will include lesser developed dryland farming systems that produce lower nutrient loads.

Separate consents

- 8.31 In her opening submissions, Ms Appleyard explained the NTFE proposal will be a long term project, with gradual conversion of the forest to irrigated agriculture over 15 years. By 2030 the forest will be completely removed and the land within the proposed site will be converted to some form of agricultural use.
- 8.32 More specifically, the proposed site is some 8596 ha in area. NTFE propose to progressively convert 7,000 ha of the Balmoral Forest to irrigated dairy farming: comprising 4,500 ha of irrigated dairy platform and 2,500 ha dedicated to irrigated dairy support. Of those 7,000 ha, 5,035 ha is proposed to be irrigated from the Waiau River take (CRC132458) with the balance most likely being irrigated by water taken from the Hurunui River by way of a run-of-river take through consents held by Hurunui Water Project (HWP) and/or AICL. The remaining 1,596 ha will not be irrigated, but will be used for a mixture of uses, including dry land farming, riparian margins, housing, and roads.
- 8.33 Both in Ms Appleyard's opening submissions and Mr Jansen's evidence it was made clear to us that NTFE is seeking a use of water consent that relates to the entire 7,000 ha of irrigated land, and change of land use over the entire 8,596 ha, despite the take water

consent only being for sufficient water to irrigate 5,035 ha. We were told the reasoning for this was because the land is proposed to be irrigated from the various sources.

- 8.34 For these reasons then, NTFE seeks a use of water consent that is entirely separate from the take consent, so as to ensure that water from other sources can be used on the land without the need to obtain another use of water permit.
- 8.35 Because of the findings we subsequently make, the rationale that NTFE has presented to support separate consents is, at least in part, no longer relevant. We have decided to follow the standard approach where we have linked the take of water to its use. We do not think we have a choice because Policy 8.1 HWRRP directs us to link the water take to a specified use. This requires identification of the site on which the specified use or activity will occur. We have provided for this outcome within the conditions.
- 8.36 However, we are prepared to issue a separate consent to use water for irrigation, primarily for ease of detailing the conditions that relate to each activity. The consent identifier number for that activity will be CRC147369. We are also prepared to issue a separate consent to divert water for the fish bypass. The consent identifier number for that activity is CRC147370. .

Change in applicant

- 8.37 We record that Miss Appleyard explained that NTFE is the applicant. However, on 1 July 2013 Ngai Tahu Farming Limited (NT Farming) was formed, incorporating the assets of the Eyrewell and Balmoral properties. Therefore, Ms Appleyard requested that if resource consents are to be granted they are granted in the name of NT Farming Limited. We acknowledge that request and will, as relevant, comply with it.

Other consents – infrastructure consents

- 8.38 In describing the NTFE proposal, Ms Appleyard noted NTFE require a number of generally ancillary or 'minor' resource consents. These included consents to construct the new canals to convey water from the existing AICL canal to Balmoral, to upgrade the existing AICL canals, and discharge water from the canal in an emergency. She noted that these separate resource consent applications have been lodged with CRC and the Hurunui District Council. Mr Jansen elaborated on these consents further in his evidence. We were also told that there will be subsequent applications for resource consent to store water on Balmoral.
- 8.39 It was NTFE's position that there was no good reason why we could not consider and determine the consent applications before us separately to the infrastructure consents, which are undergoing a separate consent process.
- 8.40 Submitters LM & G Rutherford through legal counsel, Mr van der Wal, expressed the view that the current applications were inextricably linked with the land use application for the canal works. He argued that, to a degree, the effects of the applications before us and the land use consent for canal works that were not before us were interdependent, as were the effects of those applications on the Rutherfords.
- 8.41 The Rutherfords own land on which the AICL settling pond and some 2 km of the canal conveying water from where the take point on the Waiau River is located. Indeed, an occupied dwelling is only some 20 metres from the canal.
- 8.42 Given the existence of that dwelling, two effects of particular concern to the Rutherfords are increasing vehicular traffic and accessing the canal along the western and northern boundary of the Rutherford property, which is only 20 m from the dwelling. Further concerns relate to visible changes to the canal or the flow and volume of water within the canal, structural integrity, and the frequency with which the canal will be accessed by construction or maintenance workers. The Rutherfords also noted that NTFE was considering ways of increasing the flow in the canal without undertaking any physical modifications to the canal or settling pond.

- 8.43 Mr van der Wal submitted that it was inappropriate to separate the effects of changes to the canal and settling pond from the changes to flows, volumes, and levels in the canal and settling pond. He questioned whether or not we could understand to an appropriate level the effects of the NTFE proposal before us.
- 8.44 To overcome these issues Mr van der Wal suggested NTFE provide a binding acknowledgement that if the consents before us were granted, then that fact would not play any role in justifying the adverse effects of the land use to change the canal and settling pond or any changes to accommodate extra flows, levels, and rates. The binding acknowledgment, he said, should also cover the point that NTFE accepts the risk that it cannot exercise the consents before us because it is unable to obtain the land use consents to modify the canal or settling pond.
- 8.45 Finally, Mr van der Wal raised the issue of access. He said currently access to the Rutherford property is provided to AICL pursuant to an easement. He contended that the easement would not accommodate any increased water flows, upgrades, or modification to the canal and settling pond to accommodate those flows, or the exercise of access rights by any other party other than AICL.
- 8.46 Mr van der Wal submitted that this access circumstance was a relevant consideration for us under Part 2 RMA. He contended that NTFE's claims about the benefits that would eventuate if consents were granted are not correct because those benefits would not be realised without NTFE first obtaining necessary access rights to the Rutherfords' property. He seemed to be signalling, although did not definitely say so, that the Rutherfords may not grant access. The highest he put it, at least as we understood it, was that the Rutherfords had the legal ability to withhold permission to gain access to the canal and settling pond.
- 8.47 Ms Appleyard in her reply firstly addressed the Rutherfords' concerns about any effects that could arise from any change, primarily in the water level in the canals, and in relation to other activities that may occur in or around the Rutherford property. She observed the 'water level' type of effect would be negligible simply because the take from the Waiau River would be taken over a period of time and not in one day, so any differences in water volumes or levels would be negligible.
- 8.48 Next, the matters of access to the Rutherford property and whether or not NTFE has any rights to convey water across the Rutherford property was, she said, not a matter that would or could concern us. So, she did not agree with Mr van der Wal that because access rights to NTFE had not been obtained, then benefits under Part 2 RMA could not be brought into play in our considerations.
- 8.49 She also acknowledged NTFE accepted that any risk that arises from lack of property access was a matter for it alone, and was not a relevant fact justifying decline of consent.
- 8.50 In our view, Ms Appleyard is correct in relation to the property access issue. We agree with her it is not a matter relevant to Part 2 or any other part of our considerations.
- 8.51 As to the effects impacting on the canal and settling pond, they are matters which will be considered when the consents relating to those activities, which are now in process, are decided. Insofar as those effects are relevant to our consideration, we agree, given our understanding of the NTFE proposal, the water related effects would be, or are likely to be, negligible. Other effects relating to persons visiting the site and/or any alterations to the canals or settling ponds could, in any event, only occur if an access agreement is in place.
- 8.52 In her supplementary s 42A report under the heading "Civil Works Applications", Ms Burbidge gave us her opinion on the relevance or otherwise of what we have termed 'infrastructure consents'.
- 8.53 She considered the approach that NTFE was taking, i.e., seeking consents for different parts of the project at different times (in other words, a staged approach) was appropriate. The reason for this was because the cost required to proceed with detailed design and consenting of the civil or infrastructure works applications was significant. Also, there were

concerns about the certainty of obtaining consent for the water takes. The take and use of water is a contentious part of the project. Recognising that, she said, NTFE was taking a pragmatic approach of first seeking to secure the take and use consents before expending money on detailed design and consenting of the infrastructure consents.

- 8.54 She noted that this approach was consistent and considered to be reasonable with other large applications such as the Hunter Downs Project. She noted a preference to have all applications heard together, but considered NTFE's staged approach was appropriate in this case.
- 8.55 Allowing for our consideration and findings we have made in respect of the Rutherford submissions and evidence, we reach the overall view on the infrastructure consents that we do not need to have these consents before us to properly understand the issues raised by the applications currently under consideration by us. We agree with Ms Appleyard on this point.
- 8.56 For the reasons advanced by Ms Burbidge, we also agree with her that the staged approach promoted by NTFE to this project is both reasonable and consistent with other large applications.

Relevance of HWP resource consents

- 8.57 NTFE is advancing its application during a time when the consenting environment is evolving. At the time these applications were made the HWRRP was in a proposed state. All appeals to the HWRRP been resolved and it is now operative. Overall, we agree with Ms Appleyard and Ms Burbidge that the evolution of the HWRRP during the course of processing these applications does not have a material effect upon them.
- 8.58 What is of greater moment is the HWP consent. Given the fact that the HWP consent is under appeal, how does that circumstance impact on our assessment, particularly in the context of reaching a finding about the existing environment so as to enable us to assess the effects of the NTFE proposal?
- 8.59 The HWP proposal is a large-scale application that has been granted consent by three independent hearings Commissioners. It has been appealed. That decision is significant in this case in relation to nutrient management and water quality. Because it is subject to appeal, clearly that consent cannot yet be exercised and it has not reached a commencement point as described within Section 116(1)(b) RMA.
- 8.60 Within her principal s 42A report, Ms Burbidge agreed with NTFE's position (as expressed within its application) that there was a high level of uncertainty in relation to the HWP consents, not only in relation to the effect of the appeal of those consents, but whether or not those consents would be exercised.
- 8.61 However, Ms Burbidge maintained that for NTFE's consents to be granted before resolution of the HWP appeals, NTFE would need to show that in addition to (or, in other words, allowing for) the HWP proposal, the effects of NTFE's proposed activity would need to be acceptable. She said she could not ignore the potential for the HWP consents to be fully exercised. Therefore, in her view, it is appropriate that the existing environment should include the HWP consents on the basis that they were to be fully exercised in their current form. Indeed, the specialist s 42A reporting officers assessed this application as though the HWP consents in the full *were* included within the existing environment.
- 8.62 Ms Appleyard took a different view. After referring to case law in her opening submissions, she said we should take a "*real world*" approach to interpreting and considering the make-up of the existing environment. It was her view that the existing environment included the HWP consent, but only up to the first waypoint of 15,500 ha, in conjunction with existing irrigators in the catchment.
- 8.63 She contended there was some degree of uncertainty as to whether or not HWP would ever irrigate the full command area of 58,500 ha and to the extent which land will be converted to irrigation in the Hurunui catchment. She further relied on her interpretation of

the HWP consent decision, suggesting that there was certainty for 15,500 ha (or stage I), but thereafter, because of the interplay of review conditions, it was less certain that stage II would, or could, occur.

- 8.64 Ms Appleyard also made the point that because the appeals had not yet been resolved, there remained uncertainty over the precise terms of the consent that might be available to HWP following resolution of all appeals.
- 8.65 Mr Chapman on behalf of HWP took (as to be expected) a contrary position to that of Ms Appleyard. He reminded us there is only one appeal on the HWP decision, which was lodged by AICL. He noted NTFE had joined as a section 274 party to that appeal. In his language, he told us that the issue raised on appeal is one of "*slicing and dicing*" the headroom in the Hurunui River for nutrients. He expressed confidence that it was only a matter of time before the appeal would be resolved and a consent, free of appeal, would issue to HWP.
- 8.66 In addressing us on the existing environment, Mr Chapman strongly rejected Ms Appleyard's application of a "*real world*" approach, particularly when that resulted in considering only 15,500 ha of the HWP command area as part of the existing environment. Rather, he submitted that Ms Appleyard's application of a "*real world*" approach was wrong, and that the proper approach was for us to conclude that the full 58,500 ha provided for under the HWP consent as forming part of the existing environment.
- 8.67 We agree with Mr Chapman that the HWP decision is clear that the full area of 58,500 ha has obtained consent. The reviews are, as he said, to check the NTFE proposal is producing effects in line with the evidence presented in support of the applications.
- 8.68 He did not inform us of any circumstance that would realistically support the view that HWP will *not* proceed to implement its resource consent to the full extent allowed under that consent. It was his view that the idea that only 15,500 ha of the HWP consent should be seen as part of the existing environment was artificial.
- 8.69 He acknowledged the existence of the reviews within the HWP decision and conditions. However, his key point was that no additional consent is required at those points.
- 8.70 The review paragraphs record the intention that reviews provide for uncertainties about annual volumes of water and the mitigation of nutrient losses, he said. More specifically, they record that some of the uncertainties may be addressed by advances occurring over time in science and understanding, and in monitoring and mitigating nutrient losses, rather than recording that the full consent would not be given effect to.
- 8.71 On this point we note that other than pointing to the terms of the HWP consent under appeal, Ms Appleyard did not lead any evidence in support of her "*real world*" approach.
- 8.72 By implication, Ms Appleyard drew attention to the point that it would be sometime in the future that the HWP consents were fully implemented. Mr Chapman responded on that point noting that the fact that one irrigation project may take a greater part of time to develop over another was not a relevant factor. He simply noted and agreed that HWP is a staged development because of its size and cost.
- 8.73 HWP holds consent but subject to appeal. We understood that HWP were confident that the appeal would be resolved without the need for a court hearing. In any event, we did not think the submissions advanced by Ms Appleyard on this point (given the lack of evidence to support them) provided us with a basis to reach the view that the HWP consent for the full area of 58,500 ha should not form part of the existing environment, but that some lesser area, 15,500 ha, should be included.
- 8.74 In our view, based on the evidence and submissions, we have no basis upon which to "*redefine*" (as Mr Chapman put it) the HWP consent in the way proposed by NTFE. Therefore, we have considered that the full area of 58,500 ha for the full HWP consent should be part of the existing environment.

8.75 Additional reasons for this finding follow in the Priority section below.

Priority

8.76 Mr Chapman submitted that the appeal against the HWP consents does not change the order of priority to the resource. He contended that NTFE's application can only be granted on the basis that the effects of the proposed irrigation of some 7,000 ha are acceptable in addition to, or on top of, the full development of the HWP consents.

8.77 In support of his submission Mr Chapman referred to paragraph 59 of the Central Plains Water decision:¹⁷

"There should be no risk of a major development being trumped or significantly interfered with by later smaller, simpler inconsistent proposals that are able to be made without needing to proceed in stages when, and if, the major development is subject to appeal".

8.78 In short, we agree with Mr Chapman that granting the application sought by NTFE has the potential to undermine the HWP development, because a nutrient allocation to NTFE could effectively erode the allocation to HWP.

8.79 In response to NTFE's point that its land is currently within the HWP command area, Mr Chapman was of the view that this was of no moment because the consent allocation is held by HWP and not by NTFE. He said it is irrelevant that part of NTFE's land is currently within the HWP command area, as it is ultimately for HWP to decide how the nutrient load will be managed within its command area.

8.80 Mr Chapman further noted that NTFE is not alone in having part of its landholding contained within the HWP consent area. He noted that there are many other smaller shareholders who have either part, or all, of their property within the HWP consent area. His concern was that if we were to allow this applicant to carve out of the HWP consent the nutrient discharge entitlement held by HWP, then he was concerned that there would be little left of an irrigation scheme to manage by HWP.

8.81 We accept that if this were to occur, then all of the benefits likely to arise from having a large catchment-wide irrigation scheme would be lost. These benefits, we think, are real and should not be easily displaced.

8.82 NTFE say this priority issue will not arise because the matter will be governed by the conditions it proffers. However, as we see it, we are being asked to allocate to NTFE some of HWP's existing entitlement to nutrient discharge allocations before the HWP appeal is resolved. If we were to do so we are concerned we would be making an already complex circumstance even more convoluted. We are also not satisfied, for reasons we discuss in the next section, that NTFE's proffered conditions relating to this concern are an appropriate robust solution.

Derogation

8.83 In her opening submission when discussing allocation, Ms Appleyard made it plain NTFE did not consider derogation to be a significant issue in this application. She acknowledged that a consent authority cannot grant resource consent to a limited resource that would derogate from the right of an existing consent holder. It was her core contention that this matter does not arise because NTFE proposed to put in place appropriate consent conditions to deal with this issue.

8.84 The consent condition she referred to was within the first proposed condition set provided with her opening submissions dated 5 May (i.e., Condition 4 of CRC144606). In simple terms, the condition reads to the effect that the exercise of NTFE's consent would not derogate from the ability of HWP to fully exercise its consent (or any variation or replacement consent).

¹⁷ *Central Plains Water Trust v Ngāi Properties Ltd* [2008] NZCA 71 CA 69/07.

- 8.85 As well, within that same condition (i.e., Condition 4 of CRC144606) it was provided that farming activity occurring on Balmoral shall not result in a total load of nitrogen of greater than 115 tonnes per year reaching the Hurunui River at SH1 as a six yearly average annual instream load. The 115 tonnes comprises of 63 tonnes per year from the area covered by the HWP command area (Area A), and 52 tonnes per year outside the HWP command area (Area B).
- 8.86 Ms Appleyard submitted that HWP and NTFE would not be competing at the same time for the nutrient discharge resource, therefore there was no risk of NTFE derogating from the HWP consent.
- 8.87 By the time Mr Chapman presented to us he had had opportunity to consider the proffered conditions from NTFE, including the derogation condition. He was not in favour of the approach provided for in the conditions.
- 8.88 Mr Chapman referred to the *Aoraki Water Trust* decision.¹⁸ He submitted that the consent authority would be acting unlawfully if it granted an application in circumstances where the resource was already fully allocated to another and where a new permit would have the effect of diminishing or derogating from existing consents. Mr Chapman saw that the grant of NTFE's consent, particularly in terms of NTFE utilising HWP's 62 tonnes without HWP agreement, as amounting to a derogation of the HWP consent.
- 8.89 Mr Chapman was of the view that if that situation were to occur, then permit holders would compete among themselves to satisfy their own demands. He referred to the High Court finding that such a situation would be the antithesis of the sustainable management regime contemplated by the RMA to support his submissions.
- 8.90 Mr Chapman submitted it was critical that consent holders are able to rely upon the grant of consent for planning and investment associated with the use of the resource. He noted that HWP was highly reliant on both allocation of the water *and* nutrient discharge to ensure its certainty to raise funds to develop the HWP scheme.
- 8.91 Mr Chapman emphasised the point that the Independent Commissioners who decided the HWP application granted to HWP 514 tonnes of nutrient discharge load. The Commissioners specifically provided for 52 tonnes for the Balmoral land outside of the HWP command area.
- 8.92 Returning to the NTFE conditions, it was Mr Chapman's view that if we were minded to grant consent, then NTFE should have a nutrient discharge load consent condition. It was his view it made no sense for one consent to have a nutrient discharge load and a subsequent consent not to have one. He considered uniformity of administration was key to river management.
- 8.93 (We note that on 27 June we received an update on the HWP appeal process from Mr Chapman, in which he advised that HWP and appellants had agreed that an on-farm loading rate was appropriate and should replace the in-river load currently in the consent conditions. HWP considered this appropriate for the NTFE consent, if granted, in order to maintain consistency.)
- 8.94 Returning to the NTFE condition proffered relating to derogation, Mr Chapman considered that the condition was meaningless without defining the point of derogation from the overall HWP consent. He noted that a cross-check on whether or not the Schedule 1 load limit was breached does nothing to determine the issue of derogation.
- 8.95 Mr Chapman was of the view that the suggestion that the later-in-time consent holder has the overall function of determining when someone else's consent is derogated from is fraught with what he described as administrative difficulties. In support of this submission, he made the point that NTFE clearly holds a very different picture of the extent of the rights granted to HWP than he does.

¹⁸ *Aoraki Water Trust v Meridian Energy Limited* (2005) NZRMA 251 (HC).

- 8.96 What we took from the submission was that given NTFE and HWP held a very different view of the extent of HWP's resource consent rights, then there would clearly be arguments over when those rights were derogated. Here we are referring to Ms Appleyard's view that the HWP consent is limited to 15,500 ha.
- 8.97 Ms Burbidge in her supplementary s 42A report (delivered toward the close of evidence presentation) did not agree that it was open to NTFE to use a portion of the HWP nutrient load. It was her view that accepting that the HWP consents cannot currently be exercised and NTFE has no written agreement with HWP to share that nutrient discharge load, then in these circumstances, she said there was too much uncertainty about determining the potential effects. In addition, if there was to be nutrient sharing she was of the view that a nutrient sharing agreement between the parties was required.
- 8.98 In her right of reply after referring to the *Aoraki* High Court decision, Ms Appleyard discussed derogation in the context of HWP. Her core point was the derogation could only arise if NTFE and HWP were both competing at the same time to both physically utilise the full 514 tonnes allocation granted to HWP.
- 8.99 She noted NTFE and HWP had been discussing the derogation issue, but no agreement of the wording of the derogation condition had been reached. She was of the view that Mr Chapman was not saying that NTFE's land use consent cannot be granted but rather, was concerned that conditions be in place to protect the HWP consent. She was of the view that provided there are conditions in place that provide that protection in the interim while an agreement is being resolved, that should suffice.
- 8.100 We are clear Ms Appleyard was of the view that the conditions she provided us gave that protection. We note that those conditions covered the derogation issue in much the same way as the first consent condition set dated 5 May.
- 8.101 While Ms Appleyard may be right that it will not be until sometime in the future that NTFE and HWP will physically compete for the 514 allocation resource, that in itself does not solve the issue.
- 8.102 We are told by Ms Appleyard that provided the position is protected in the interim by a condition that protects HWP, then the parties will work on the matter and she is confident an agreement will be forthcoming.
- 8.103 We do not think it appropriate that we grant a resource consent requiring HWP to enter into such an agreement with NTFE. In fact, we cannot do so because that would require compliance of a third party. We do not think we could issue a consent conditional upon NTFE achieving an agreement with HWP because that may require NTFE to bring about a result not in its power. Such a condition would be invalid. It seems to us there has already been ample opportunity for an agreement to be considered, explored, discussed, and resolved. That has not happened. We are not convinced this position would change in the future.
- 8.104 We understand Ms Appleyard's point that the issue of derogation only comes into play when there has been a full allocation of the resource. As we see it, that outcome is clearly in prospect here. Indeed, the nutrient allocation resource has been allocated to the extent that NTFE needs to rely on utilising a resource currently held by another party (HWP), which is still subject to appeal to develop Balmoral in the way it wishes. So, it seems to us we have now reached the stage where this a full allocation of the nutrient discharge resource.
- 8.105 As Ms Appleyard pointed out herself when she referred to the *Aoraki* decision, it is not open for a consent authority to grant a consent to another party that will, or could, deliberately erode a prior grant unless it is acting pursuant to specific statutory powers. We have no specific statutory powers to deliberately erode a grant. Thus, to grant consent to NTFE, we must rely on Ms Appleyard's position that we are not, at the time of granting to NTFE, eroding the earlier grant given to HWP. The basis presented by Ms Appleyard to satisfy us was the resource consent condition wherein NTFE committed not to derogate the HWP consent or, alternatively, that due to timing NTFE and HWP were not at the same

time physically utilising the nutrient resource.

- 8.106 In terms of facts to support her timing proposition, we acknowledge and accept that HWP is some way off from implementing its consent. It must first resolve its appeal, then raise financial support and build the necessary infrastructure. All of which will take time. In contrast, because of availability of infrastructure for NTFE, it is likely they would be able to implement their consent for the NTFE proposal, if granted, earlier in time than HWP. It seems to us that NTFE being able to develop earlier in time than HWP does not resolve the issue of NTFE and HWP competing for the nutrient discharge resource. It simply delays the time when that competition may occur. Granting a consent allowing NTFE to make use of HWP's nutrient discharge allowance without its agreement seems to us to be laying the groundwork for that competition, and possible dispute in the future.
- 8.107 Following Ms Appleyard's reasoning, at the time any competition arose for the resource, NTFE would have developed Balmoral, spending significant sums of money. Also, HWP may have invested significant sums of money in developing and advancing the HWP project. Allowing both HWP and NTFE to be subject to such uncertainty did not seem to us to be consistent with the purpose of the RMA because we were allocating resource rights in an uncertain context with uncertain outcomes. Also, granting consent on these terms would, we think, be creating enforcement and compliance difficulties for the consent authority.
- 8.108 As to the condition point, Mr Chapman and Ms Burbidge contend a condition of the sort promoted by NTFE would be extremely difficult to apply, let alone enforce. It lacks certainty and it lacks clarity.
- 8.109 As the *Aoraki* decision holds, when a consent authority has made a commitment to allocate a resource then the grantee is reasonably expected to proceed with planning and investment on the basis the consent authority would honour its commitment. If that were not the case, then there would be a serious undermining of public confidence in the allocation system.
- 8.110 As in the *Aoraki* decision, we think this reliance Mr Chapman talked of on behalf of HWP strengthens his argument that HWP's legitimate expectation arising from the grant (subject to appeal) should be recognised and provided for. It would be different, we think, if he was comfortable with the derogation condition proposed by NTFE, but clearly he is not.
- 8.111 We reach the view then that we would not be supporting public confidence in the allocation of the resource if we were to accept Ms Appleyard's submissions and the condition she proffers.
- 8.112 We think that the condition is problematic. It is uncertain and has real issues with enforcement. At the time when the condition would come into play, both NTFE and HWP could have heavily invested in each proposal. That is hardly the context in which to resolve competition for the resource. The better option, we think, is to have an agreement in place now. Without having an agreement, we cannot see a clear or appropriate way to proceed as Ms Appleyard would wish us to, allowing NTFE to utilise 63 tonnes of nitrogen load which has been allocated to HWP by an earlier resource consent, albeit subject to an appeal.
- 8.113 It is our finding then, that in the absence of an agreement with HWP and given the uncertainties we have referred to earlier, we are not prepared to grant a resource consent to NTFE allowing it to utilise, even on an interim basis and even after considering the conditions promoted by NTFE, the 63 tonnes of nitrogen discharge load currently allocated to HWP.
- 8.114 In short, we consider the uncertainties inherent to the approach proposed by Ms Appleyard to be so great that to make a decision based on that approach would not meet the purpose of the RMA.
- 8.115 In any event, as will be clear from what follows when we are assessing the nutrient

discharge effects of the preferred NTFE highly developed dairy farm proposal, we reach findings that to allow NTFE to discharge 115 tonnes would not meet the purpose of the RMA.

9 PRINCIPAL ISSUES IN CONTENTION

9.1 There are three principal issues arising from NTFE's applications. These are as follows:

- (a) Water Quality in the Hurunui River
- (b) Instream values of the Waiau River
- (c) Annual volume and efficiency of the take and use

10 WATER QUALITY IN THE HURUNUI RIVER

- 10.1 Within this section of our decision we consider under s 104(1)(a) RMA, firstly, any actual or potential effects on the environment of allowing the change of land use on Balmoral at the highly developed end of the range, which includes irrigation and dairying up to a maximum area of 7,000 ha. This is NTFE's preferred development option. Secondly, we consider under s 104 (1)(b) RMA, any relevant provisions of relevant National Environmental Standards, Regulations, and Plans, and other relevant matters under s 104 RMA.
- 10.2 The application, as with any intensive farming system, will result in contaminants entering the adjacent ground and surface water. The two nutrients of most concern are nitrogen and phosphorus. Both are applied as fertilisers and are also returned to the soil via dung and urine, including through the spreading of effluent.
- 10.3 Phosphorus typically binds to soil particles and is often lost as overland flow during times of heavy rainfall or through streamside erosion, although it is also lost in a soluble form by leaching from the soil into groundwater. This is discussed further below.
- 10.4 Nitrogen is highly soluble, and leaches from the soil into groundwater and then into surface water. Once in water is difficult to remove. Farm management focuses on reducing this leaching.
- 10.5 In addition to nutrient contamination, bacteria and other microbes can also reach waterways and cause issues for drinking water quality.
- 10.6 Before discussing the implications of the NTFE proposal on water quality, we wish to note that we were impressed with the commitment to environmental management, including the use of best practice farm management. This was demonstrated in the evidence of Mr and Mrs Back and Andrew Clayton, managers of NTFE's Eyrewell property. In particular, the commitment to techniques such as variable irrigation and ongoing monitoring and auditing of farm practices, suggested to us that the impacts of the farming operation on the environment would be as small as realistically possible. We have taken this commitment into account in our later considerations.

HWRRP limits

- 10.7 Objective 5.1 details the outcomes for which water quality is to be managed in the Hurunui mainstem. The focus of the HWRRP is to manage both nitrogen and phosphorus inputs in order to protect mauri¹⁹ and natural biota, ensure aquatic species are protected from chronic nitrate toxicity, control periphyton growth that would adversely affect recreational, cultural and amenity values, and protect drinking water quality.

¹⁹ Defined in the HWRRP (definitions section) as "*The essential life force inherent in all things and includes: (a) aesthetic qualities e.g. water clarity, natural character and indigenous flora and fauna; life supporting capacity and ecosystem robustness; depth and velocity of flow; continuity of flow from the mountains to the sea; fitness for cultural usage; and productive capacity*".

- 10.8 The HWRRP has a particular focus on managing periphyton growth. Periphyton includes diatoms, filamentous green algae, and cyanobacteria. There was general agreement that excess growths of filamentous green algae and cyanobacteria mats can clog the riverbed, look unsightly, interfere with fishing lines, and change the instream community composition. Cyanobacteria, in particular the *Phormidium* species, give rise to what are commonly referred to as 'toxic algal blooms'.
- 10.9 The toxins produced from the toxic algal blooms are a health risk for animals and humans if ingested and taint food procured from the river. We were told toxic algal blooms have become a particular issue in Canterbury in recent years, including in the Hurunui River, and have resulted in dog deaths, the temporary closure of stretches of rivers for recreational use, and the closure of drinking water supplies.
- 10.10 Periphyton requires both nitrogen and phosphorus for growth. The HWRRP approach is to prevent increases in nuisance periphyton growths by maintaining the phosphorus concentration and load within the Hurunui River at 2012 levels. While phosphorus levels are held steady, the HWRRP allows for a moderate increase in nitrogen load in the river (25% above 2012 levels) in order to provide for increased land use intensification. Any land use change must not result in an increase in phosphorus entering the river, but can discharge some nitrogen, up to the HWRRP load limit as set in Schedule 1.
- 10.11 The specific water quality limits are set in Policies 5.3 and 5.3B, and in Schedule 1. These refer variously to water quality parameters within the mainstem of the Hurunui River in general, at the Mandamus confluence, at SH1 and in the tributaries. Given the direction of groundwater flow discussed earlier, and the lack of surface water tributaries on the property, we are satisfied that the application could only affect water quality within the Hurunui mainstem downstream of the application site (below SH7). We will therefore concern ourselves only with the limits relating to the mainstem of the river from that point downstream. The application will not result in the discharge of contaminants into the Waiau catchment and so we have not specifically considered the nutrient limits that relate to that catchment.
- 10.12 Consequently, the limits of relevance to this application, in order that Objective 5.1 is achieved, are:
- (a) Policy 5.3 (a): The 95th percentile of monthly periphyton biomass measurements in the mainstem of the Hurunui River shall not exceed 120 mg/m² chlorophyll a or 20% cover of filamentous algae more than 2 cm long;
 - (b) Policy 5.3 (c): The average dissolved reactive phosphorus concentration in the mainstem of the Hurunui River shall not exceed 0.0044 mg DRP/L;
 - (c) Policy 5.3 (e): The annual median and 95th percentile nitrate-nitrogen concentrations in the mainstem of the Hurunui River below the Mandamus flow recorder site, shall not exceed 2.3 and 3.6 mg NO₃-N / L respectively, these being the chronic nitrate-nitrogen toxicity thresholds for maintain a 95% species protection;
 - (d) Policy 5.3B: To protect existing values, uses, and the mauri of the Hurunui and Waiau Rivers and their tributaries, while also allowing for a larger area of land to be irrigated, by only allowing land use changes that will not result in a breach of the water quality limits set in Policies 5.3 and 5.3A and additionally for the Hurunui River, will not result in a breach of the nitrogen load limits set in Schedule 1; and
 - (e) Schedule 1: State Highway 1 flow recorder: 963 tonnes/year dissolved inorganic nitrogen.
- 10.13 We note here that dissolved inorganic nitrogen (DIN), referred to in Schedule 1, comprises nitrate, nitrite and ammonia. The predominant form in natural, oxygenated environments is nitrate (referred to in policy 5.3(e)), such that the concentrations of nitrate and of DIN are roughly equivalent. To simplify our discussion we refer from here on to all forms of nitrogen as 'N', and all forms as phosphorous as 'P'.

Interpretation of HWRRP water quality limits

- 10.14 Before assessing whether the HWRRP limits have already been reached, or will be reached as a result of this application, it is necessary to discuss the calculation methods used to determine this, as this was contested in the hearing.
- 10.15 Both the periphyton limits in Policy 5.3(a) and the N concentration limit in Policy 5.3(e) refer to '95th percentiles'. Mr Callander for NTFE presented statistical data to show that a 95th percentile could only be calculated with any degree of accuracy from a minimum of 60 samples (i.e. 5 years of monthly data). Dr Meredith's (a section 42A report officer) view was that if a percentile assessment was to be used, the Hazen method, which relies on 30 data points (i.e. 2.5 years of monthly data) was the nationally recommended calculation methodology. Given this is the nationally recommended methodology, the data should ideally have been presented using this methodology. We note that Dr Kilroy for NTFE presented data using 95th percentiles calculated using averages over both 5 years and 2 years. We have relied on Dr Kilroy's 2 year averages, as we assume they will be closest to those calculated using the Hazen method.
- 10.16 Both the P concentration limit in Policy 5.3(c) and the N load limit in Schedule 1 were set in the HWRRP by calculating the average annual load over the previous six years (2005-2011). We understand that this was to take account of the significant annual variability in the data. Mr Callander considered that because such a method was used to set the limit, an average over six years should also be used to determine compliance.
- 10.17 Dr Meredith drew a distinction between the HWRRP concentration limits in Policies 5.3(c) and (e) and the Schedule 1 load limits. The concentration limits are designed to manage more immediate effects on instream values (periphyton, fisheries, recreation etc), while load limits are of more value in managing land use change. While there was no debate about the use of 6-year averages for the nitrogen load calculation, in Dr Meredith's view the average P concentration should be calculated over one year because a long-term average will not protect the instream values it is designed to protect, as it allows large increases (and therefore effects) in one year to be averaged out over several years.
- 10.18 A similar discussion on the appropriate calculation method for the P concentration was held during the HWP consents hearing, and we reach a similar conclusion to the one reached there. The clearly stated intention of the HWRRP (e.g. Section 1.4.5, page 9) is to maintain P at the current average concentration. This was on the basis that the river is P limited, and therefore periphyton growth could be managed by retaining P at its existing level.
- 10.19 If compliance with the P standard is based on an annual figure, then even if P concentrations are maintained over time, the concentration will be above the limit for approximately half the years, and below the limit for the other half. This would provide no certainty for resource users within the catchment. Calculating an average over six years on an ongoing basis smoothes out annual variability and allows any trend over time to be seen. In our opinion, this more effectively allows monitoring of whether the HWRRP's purpose - to ensure concentrations of P do not increase - is being achieved.
- 10.20 We therefore agree with Mr Callander and consider that compliance should be tested against a 6-year average for both the N load and P concentration limits.

Will the NTFE proposal comply with Policy 5.3 (c) – Phosphorus concentration in the mainstem of the Hurunui River?

- 10.21 The clear aim of the HWRRP is to retain the instream phosphorus concentration at the level it was when the plan was notified – 0.0044 mg/L. As discussed above, we consider it more appropriate to interpret this standard as a running average over several years, rather than an annual figure.
- 10.22 Mr Callander presented data showing the average concentration over the last two 6-year periods to be 0.0040 mg/L (2007-2012) and 0.0037 mg/L (2008-2013), using data collected by ECan. Both Dr Kilroy and Mr Callander presented graphs showing P

concentrations in the river since 2006 and 2005 respectively. While Mr Callander's graph appears to show a gradual decline in concentration over this period, Dr Kilroy (in relation to her graph) stated that the slope is not statistically significant; that is, it cannot be shown there has been a change over this time. Given the lack of data showing a clear decline in concentration, we conclude that the average P concentration remains at or close to the HWRRP limit.

- 10.23 In order to maintain phosphorus at the same level, there can be no additional increase in phosphorus discharge from any land use unless there is a corresponding reduction elsewhere in the catchment. This is a high threshold to achieve.
- 10.24 We heard evidence from NTFE's witnesses, in particular Mr Brough, about the likelihood of phosphorus loss. At times this evidence was contradictory, due partly to a lack of clarity around how OVERSEER™ models phosphorus loss, and a lack of clear information on phosphorus leaching from the soil. This appears to be an area where the science is progressing.
- 10.25 The primary method of P loss from farming systems is via overland flow, where excess water washes soil, to which P is adsorbed, into surface water. The P can then desorb from the sediment and become available for plants within the river.
- 10.26 Loss of P in this way can be mitigated by preventing overland flow and providing riparian buffers to slow any such flow and allow the soil particles to be deposited on land. NTFE considered there was no possibility of overland flow as Balmoral is very flat, there are no streams on it, and a significant riparian buffer (between 100 m and 400 m) will be retained along the river boundary.
- 10.27 P can also be lost by leaching from the soil into the groundwater. We were provided with a copy of a paper (in press) by Dr Richard McDowell *et al.*,²⁰ which discusses the potential linkage between soil, surface water and groundwater concentrations of phosphorus.
- 10.28 Traditionally, loss of P by leaching from the soil has been discounted as a major source of P loss, apart from some exceptions such as where there are sub-surface drains or soils with poor P storage capacity. Dr McDowell's analysis of NZ data showed that under certain conditions significant quantities of P can enter groundwater, particularly under dairying, where there is gravel or sand lithology. In these aquifers, P is mobile due to high transmissivity within the groundwater, the potential for bypass flow, and low P adsorption capacity.
- 10.29 There was also evidence for a linkage between increasing concentrations of P in groundwater and adjacent surface water. The McDowell paper concludes that groundwater could contribute significant quantities of P to surface water if connectivity between ground and surface water is good, intensive land use (such as dairying) is coupled with soils prone to leaching, and aquifers are dominated by gravels and sands. All these criteria appear to be met in this situation. We do note, however, that the farms involved in the McDowell study were not necessarily using best practice methods for P management, as is proposed by NTFE.
- 10.30 Webb (2010)²¹ classifies the Eyre, Rangitata and Rakaia soils on Balmoral, which are located closest to the Hurunui River, as having high P leaching vulnerability (23.7% of the site area) or very high P leaching vulnerability (3.3% of the site area). This vulnerability relates to the ability (or inability) of the soil to adsorb P. Across the rest of Balmoral the leaching vulnerability is classified as low.
- 10.31 NTFE proposes to retain the area classified as at very high risk of P leaching as riparian margin and it will not be farmed. In order to reduce the risk of leaching in the area identified as having a high risk, P fertiliser will be applied only in a form that dissolves

²⁰ McDowell, R., Cox, N., Daughney, D., Moreau, W., in press. A national assessment of the potential linkage between soil, and surface and groundwater concentrations of phosphorous.

²¹ Webb, T., Hewitt, A., Lilburne, L., McLeod, M., Close, M., 2010. Mapping of vulnerability of nitrate and phosphorous leaching, microbial bypass flow, and soil runoff potential for two areas of Canterbury. Report No. R10/125 Environment Canterbury.

slowly.

- 10.32 Webb also classifies soils in relation to their vulnerability to leach P through bypass flow. This is transmission of water through macropores, bypassing the finer pores of the soils matrix and so allowing contaminants to be transported rapidly through the soil, reducing the likelihood of adsorption onto soil particles. As discussed in Dr McDowell's paper, this increases the risk of loss of P into groundwater. The bulk of Balmoral is classified as having medium vulnerability to bypass flow. This classification corresponds to the part of Balmoral identified as having low leaching vulnerability, meaning that all parts of Balmoral have some risk of leaching P.
- 10.33 Also at issue was the likelihood of adsorption of P (and therefore its removal) within the aquifer beneath Balmoral. The likelihood of adsorption is increased if there are fine particles such as clays and silts present within the strata. Dr Scott's view was that there were few clays present. Where clays and silts are present, they occur as lenses, rather than a continuous layer, and so are limited in their ability to remove contaminants. Mr Callander's view was that there are clays interspersed throughout the gravels and sand, and that two wells drilled recently showed significant layers of clay. The presence of clays is consistent with the poorly sorted deposits that form in a basin away from the main river channels. He considered that fine particles will be present throughout most of the strata through which the soil drainage water will pass and the ability of these clays to adsorb P should not be ignored.
- 10.34 It is clear to us that the aquifer lithology is variable beneath Balmoral and that clays are present in at least some areas. Consequently, we agree with Mr Callander that there is the potential for some removal of P within the groundwater although this has not been quantified.
- 10.35 The important point in Mr Brough's and Mr Callander's evidence is that P leaching into groundwater is only an issue if application rates are high. They considered that this will not be the situation at Balmoral due to the proposed farm management techniques. These include the application of effluent at very low rates across the bulk of Balmoral, minimising drainage, annual soil testing for P, and applying P in split loads throughout the summer.
- 10.36 OVERSEER™ predicts the quantity of P leached under the farm management system proposed. The OVERSEER™ output consists of two values. The first is P lost from 'other sources', which relates to leaching from effluent ponds and run-off from farm tracks. Mr Brough was confident that there will be zero P loss from these sources due to the impermeable lining of effluent ponds and the lack of run-off from Balmoral. The other output was the source of some confusion. It was clarified during the hearing that this loss represents both overland run-off and subsurface leaching, however the proportion of each is unclear. OVERSEER™ predicts a loss of 1,931 tonnes per year from Balmoral under the highly developed proposal (not including loss from 'other sources'), or 1,766 tonnes if 10% irrigation efficiency improvements are made.
- 10.37 While it is not clear what proportion of this loss is predicted to occur through leaching, there was acceptance from Mr Brough and Mr Ian Brown that a small proportion of the P applied could be leached from Balmoral. Mr Callander also concluded that the contribution of P in the Hurunui River from the Balmoral could increase "by a small amount".
- 10.38 Overall, we accept that P loss via overland flow is likely to be negligible. We also conclude that there is a risk of P loss via leaching, but that NTFE has proposed reasonable measures to ensure this is minimised. There is no data to quantify how much P will be lost via leaching and how much will ultimately find its way into the Hurunui River. We suspect the quantity lost will be small, but are aware that the policy effectively prevents any additional loss, so the potential for exceedance exists.
- 10.39 To manage this, NTFE have proposed a condition requiring that:

"land use activities on the Land shall not cause an increasing trend in the concentrations of DRP leaving the land and reaching the Hurunui River that could contribute adversely to periphyton growth, relative to the 2005 – 2011 period".

An advice note indicates that this will be determined in accordance with the groundwater monitoring undertaken.

- 10.40 We are not confident that this condition will ensure Policy 5.3(c) is met. We are also not sure how it would be monitored. We therefore prefer a somewhat simpler condition:

"Land use activities on the Land shall not cause an increase in the concentration of DRP in the groundwater beneath the Land".

- 10.41 Achieving this will require very tight management of farming activities to ensure compliance with Policy 5.3(c). We have retained the advice note.
- 10.42 We have included a review condition which allows the conditions of consent to be reviewed should there be any breach of the P limit in Policy 5.3(c) which may arise from the exercise of the consent.

Will the NTFE proposal comply with Policy 5.3(e) – Nitrate-nitrogen concentration limit?

- 10.43 The nitrate concentration limits are set to prevent nitrate toxicity in instream fauna²² and ensure water does not become unsuitable for human consumption²³. Mr Callander presented data showing the median and 95th percentile data at SH7 and SH1 are significantly below the HWRRP limits for these sites (the annual median is currently 0.4 – 0.5 mg/L compared to the plan limit of 2.3 mg/L).
- 10.44 Dr Kilroy and Dr Meredith agreed that the concentrations within the mainstem were likely to remain well below the HWRRP limits as the N load limit would prevent such high concentrations being reached.
- 10.45 We are satisfied for this reason that the NTFE proposal will not result in the limit in Policy 5.3(3) being exceeded.

Will the NTFE proposal comply with Policy 5.3B - Schedule 1 dissolved inorganic nitrogen load limit?

- 10.46 Many submitters were concerned about the discharge of N from the NTFE proposal. As discussed above, the N concentration limit is set in the HWRRP at a high level to prevent toxicity in instream fauna. However, increases in N concentration in the river below this limit have the potential to increase periphyton growth.
- 10.47 We heard that cyanobacteria growth, in particular, responds to high N concentrations. Mr Pearson for Fish & Game also highlighted the potential ecological effects as N concentrations increase (but below the toxicity levels). Whilst we heard evidence from both Mr Callander and Dr Meredith that the load limits are intended to be a tool managing land use activities, in practice they appear to us to act by effectively restricting the concentration in the river.
- 10.48 In order to determine whether the load limit will be breached we need to address several related issues, as below:
- What is the available 'headroom' – that is, the available N load that can be discharged before the plan limit is reached?
 - What is the estimated N discharge from the NTFE proposal, over time?
 - What is an appropriate attenuation factor?
 - Will the N lost, after attenuation, breach the load limit?

What is the available 'headroom'?

²² Objective 5.1(d).

²³ Objective 5.1(e).

- 10.49 The in-river load at the time the HWRRP was notified was 770 tonnes N/year. This figure was also used as the baseline in the HWP decision. The figure for 2012/2013, calculated as an average of the previous six years, is 792 tonnes. NTFE considered that we should use 770 tonnes as the baseline from which to calculate the available headroom. Dr Scott and various submitters considered that the figure of 792 should be used. To resolve this it is useful to understand how the figure is calculated.
- 10.50 As discussed above, the N load limit in Schedule 1 was set by calculating an average over six years of data. The HWRRP allows a 25% increase in N above this baseline, so having calculated the average over the six years to be 770 tonnes, a 25% increase resulted in a limit of 963 tonnes being set in the plan. The calculation methods used by ECan to determine the load were described by Mr Callander, and involve taking an average of two different statistical methods. These methods estimate an annual load based on the N concentration and the flow in the river. Mr Callander considered that the calculations undertaken would not reflect the true load in the river due to the monthly (as opposed to more frequent) sampling regime, and possible bias due to sampling at high flow conditions. Given these sensitivities he expected significant variations in annual load from year to year.
- 10.51 Dr Brown, for ACIL, also provided some helpful evidence on this issue. He concluded that given the significant variability in annual loads (due in his view to natural hydrological variability), there is a small chance each year that the load could be exceeded without additional irrigation in the catchment.
- 10.52 This variability means it is difficult to detect any statistically significant trends in N load using the 6-year rolling average as the only indicator. Dr Brown's opinion was that a long term increase could only usefully be determined by considering both N load and concentration together. Data presented for both between 2005 and 2013 shows no clear trend.
- 10.53 Using ECan's calculation methodology, the 90% confidence interval of the six year average load is ± 193 tonnes. That is, the current calculation of 792 is not statistically significantly different from the 770 tonnes calculated at the time the HWRRP was formulated. Given this, it may be reasonable to use 770 tonnes as a 'baseline' load for the catchment in its current state, rather than 792. This would be appropriate if there had been little intensification in recent years, or if any such intensification has been offset by reductions in nutrient load in other parts of the catchment.
- 10.54 Mr Barton for AICL advised that over recent years a large proportion of the border dyke properties within the AICL area had been converted to spray irrigation. Today 87% of the irrigated AICL scheme land within the Hurunui catchment has spray irrigation. The reduction in drainage associated with conversion to spray irrigation typically reduces the N leaching loss and so a reduction in N load in the catchment might be expected. This appears to be occurring in the tributaries draining the AICL scheme area, as shown in Dr Brown's Figure 4, which suggests a reduction in N load over the last three or four years. However, no such trend is apparent in the load measured at SH1, which led Dr Brown to conclude that any gains made in N reduction within the AICL scheme were being offset by an increase in N discharge elsewhere.
- 10.55 Mr Barton explained that conversions of border-dyke are, as a general rule, associated with a change to a more intensive land-use (for example, from sheep and beef to dairying or dairy support, or an increase in stocking rate), in order to increase the returns to the property to pay for the conversion. Some of this change would occur as a permitted activity under the HWRRP. Mr Barton produced consent information that showed there had been nine new consents to discharge dairy effluent between 2011 and 2013. The implication of this is that there had been nine new dairy conversions or expansions of existing dairy operations during this time, as well as an unknown number of land use intensifications that did not require consent.
- 10.56 The overall message from the AICL witnesses was that the reduction in N discharge from conversion to spray was being offset by more intensive land use. We note also that changes in load are further complicated by the lag time for nutrients to reach SH1. Witnesses were generally in agreement that nutrients would move from the soil to the

river, and down to SH1 at varying speeds, from months to up to six or seven years.

- 10.57 Overall, while we accept that there has been some land use intensification over the past two years, increased nutrient discharge resulting from it is likely to be counter-balanced by the gains made over recent years through conversion to spray. For this reason, and given the lack of any statistically significant increase in load since this time, we consider it appropriate to use 770 tonnes as a baseline from which to determine the available headroom. This is also consistent with the HWP decision.
- 10.58 Having established that for the purposes of this application the current N load at SH1 is 770 tonnes, our calculation to determine the allocation available to NTFE is as follows:
- (a) The available load is the N load limit specified in Schedule 1 (963 tonnes) less the current N load (770 tonnes) = 193 tonnes.
 - (b) A total of 514 tonnes has been allocated to HWP. This comprises 371 tonnes that are currently being leached (i.e., included within the 770) plus an additional 143 tonnes.
 - (c) This means there are 50 tonnes still available to allocate to NTFE (193 – 143), plus 2 tonnes of N leached from the existing forestry (included within the 770).
 - (d) This results in a total of **52 tonnes N available for allocation**. This does not take into account the attenuation factor, which is discussed further below.
- 10.59 Further to this, within the 514 tonnes allocated to HWP, 63 tonnes represent the proportion that could be leached from the NTFE land if the HWP development proceeds. However, as discussed earlier, this has been allocated to HWP and to further allocate it to NTFE in our view would not be appropriate, for reasons we have already provided.
- 10.60 We have also considered whether there are any other priority applicants for nutrient load. Ms Burbidge advised us that there was one applicant for land use change ahead of NTFE in time. However, this application is located downstream of SH1 and therefore will not contribute to the load at SH1. We are therefore satisfied that no other applicants have priority over nutrient load allocation ahead of NTFE, and that 52 tonnes N is available for allocation.

What is the estimated N discharge from the NTFE proposal, over time?

- 10.61 In the application that was originally lodged NTFE provided an estimate of N discharge from the property at 2-yearly intervals, through to 2030 as development progressed. The estimates were derived primarily from OVERSEER™ modelling. These figures were updated at the commencement of the hearing, and again in closing submissions. The final set of figures was obtained from modelling carried out by Mr Brough following discussion with Mr Ian Brown, a s 42A reporting officer, inclusion of additional mitigation such as covered wintering pads, and inclusion of more detailed data on soils. These figures show a total maximum N loss of 305 tonnes per year in 2030, once the proposed development is complete. Mr Brough then re-ran OVERSEER™ assuming 10% less drainage, which resulted in a predicted maximum annual N loss of 270 tonnes per year; that is, an average rate of 31.4 tonnes/ha/yr over all of Balmoral.
- 10.62 The 10% irrigation efficiency gains were based on the opinion of the Mr Back, the Eyrewell Farm manager. Actual Eyrewell data for 2013/2014 was used in the Balmoral modelling, however, over this period the irrigators at Eyrewell were not working as efficiently as possible due to storm damage and it was Mr Back's opinion that 10% less water would otherwise have been used.
- 10.63 Mr Brough was convinced discharge of 270 tonnes per year was more realistic than 305 tonnes. He also considered that further reductions could be achieved through irrigation efficiency improvements on dairy support land, the use of Italian rye grass and future improvements as the result of ongoing research.

- 10.64 Mr Ian Brown's view was that the predicted loss of 305 tonnes was "*optimistic but not totally unrealistic*". He considered the irrigation inputs and consequent drainage were lower than he would expect, as well as having other minor concerns with the inputs used. In his opinion, these discrepancies resulted in a small underestimation in nitrogen loss.
- 10.65 OVERSEER™ is regularly reviewed and updated as new information becomes available, and so an estimate at any given time is simply the best estimate available at that time. There is no way of knowing how accurate the estimate is without actual measurement of drainage and nutrient concentrations on-farm. This is occurring at Eyrewell at present, and when these results become available this will add greatly to the accuracy of the predictions here, given that many aspects of the farming operations are similar.
- 10.66 We do not think it critical (or in fact possible) to attempt to resolve all the differences in the modelling inputs. Suffice to say we are satisfied that approach taken to the modelling by NTFE is reasonable. As more data becomes available (for example actual water use from Eyrewell over next and future seasons), the accuracy of the modelling will improve.
- 10.67 NTFE is proposing a condition that limits the average rate across Balmoral to 31.4 kg/ha/year. For reasons to be discussed later we have limited the annual discharge rate to a lower figure. NTFE will be obliged to adhere to this, and if future versions of OVERSEER™ predict higher nutrient losses than permitted in the consent, their activities will have to be adjusted (reduced) accordingly.
- 10.68 Conversely, if efficiency or other improvements can be made that reduce the rate of N loss, then NTFE will be able to take advantage of this to allow further development. In time the research data from Eyrewell will be available and we expect the available modelling from that point on will be considerably more accurate.
- 10.69 We note here that we heard various criticisms over the course of the hearing about the appropriateness of the OVERSEER™ estimates presented to us, including from Fish & Game, Whitewater NZ, and Mr Snowden. We acknowledge their concerns, but draw their attention our comments in this regard above.

What is an appropriate attenuation factor?

- 10.70 Determination of an appropriate attenuation factor is a critical issue in this application, as the factor chosen makes a significant difference to how much N can be leached at Balmoral and still remain within the HWRRP Schedule 1 N load limit at SH1. Several submitters, including Forest and Bird, Fish & Game, Whitewater NZ and Community and Public Health presented evidence on this point.
- 10.71 The attenuation factor is an estimate of how much of N leached from the root zone makes its way down the catchment to, in this case, SH1, where the catchment N load is measured. It is commonly given as a number between 0 and 1. Rather confusingly it can be described in two ways - no loss of N is sometimes described as an attenuation factor of 0 and sometimes as an attenuation factor of 1. In this decision we will use the method adopted by Dr Scott in her supplementary s 42A report: that is, the attenuation factor is calculated as:

$$1 - (\text{observed load at SH1} \div \text{load leached}).$$

That is, it is the proportion of N removed from the system.

- 10.72 Dissolved inorganic nitrogen, which is the parameter referred to in Schedule 1, comprises mostly nitrate, but also nitrate and ammonia. Attenuation is the process whereby nitrate is removed from the ground and surface water system. It occurs primarily through denitrification, which is the conversion of nitrate and nitrite to gaseous nitrogen which is subsequently lost to the atmosphere, but also through uptake of nitrate into soil and plants. While plant uptake may not be true attenuation, but rather storage of nitrogen, it can nevertheless result in removal of N from the river system (for example nitrate is incorporated into periphyton growth which is subsequently washed from the river during a high flow).

- 10.73 Attenuation factors appear to be typically derived by broad scale catchment modelling, comparing estimates of the nitrogen leached at the root zone with measured or estimated loads at the bottom of the catchment. NTFE assumed, in its evidence, an attenuation factor in the region of 0.5. This was based on work undertaken for the HWP application, as explained in Mr Callander's second supplementary evidence.
- 10.74 This work estimated a nitrogen leaching loss of 1,344 tonnes/year from land that contributes ground and surface water to the mainstem of the Hurunui River between Mandamus and SH1. This was compared to the measured load of N in that reach of 731 tonnes / year. These figures suggest that 54% of the N estimated to be leaching from the soil appears at SH1, that is, an attenuation factor of 0.46. This figure is the origin of the attenuation figure used in the NTFE application. A figure of around 0.5 was supported by other catchment-wide studies such as Elliot et al (2005)²⁴ and Rutherford (2013)²⁵.
- 10.75 There was considerable discussion throughout the course of the hearing on the mechanisms that might account for 50% loss of N, and whether such mechanisms were relevant to the Balmoral situation.
- 10.76 Mr Callander considered there were three possible explanations for the apparent loss of N within the Hurunui catchment between Mandamus and SH1. These were:
- (a) A time lag between nitrate leaching and it appearing at SH1;
 - (b) Uncertainty in the estimates of nitrate leaching;
 - (c) Loss of nitrogen (attenuation).
- 10.77 We consider these in turn:

A time lag between nitrate leaching and it appearing at SH1

- 10.78 Mr Callander dismissed a time lag having a significant influence on N loads in this section of the catchment as firstly, the majority of it is undeveloped and hence nitrate loss would have been steady for many years, and secondly, within the irrigated areas (primarily AICL land) increases in N loss from intensification are expected to have been balanced by a reduction in N loss due to a conversion from border-dyke to spray irrigation. We agree with this analysis. As we concluded earlier, there is likely to have been little change in N leaching over recent years and therefore no potential for changes in load to be 'delayed in transit'.

Uncertainty in the estimates of nitrate leaching

- 10.79 In Mr Callander's view, errors in the N load calculations were the most likely explanation for the apparent N loss.
- 10.80 The leaching losses were calculated using ECan's 'look-up' tables (Lilburne et al. 2013)²⁶, which list estimated N loss for different land use types. In the examples given in Mr Callander's second supplementary evidence, the look up tables appear to underestimate losses compared with the most recent OVERSEERTM modelling. As pointed out by Mr Callander, this would suggest that the loss of N within the catchment is even greater than the 54% referred to earlier.
- 10.81 However, very little evidence was presented to us to suggest that OVERSEERTM over-estimated the amount of N lost under current land-use practices. We also received no

²⁴ Elliot, A.H., Alexander, R.B., Schwarz, G.E., Shankar, U., Sukias, J.P.S., McBride, G.B., 2005. Estimation of nutrient sources and transport for New Zealand using the hybrid mechanistic-statistical model SPARROW.

²⁵ Rutherford, K., 2013. Effects on land use on nutrients. Phase 2 studies in the Tukituki River, Hawkes Bay.

²⁶ Lilburne, L., Webb, T., Robson, M., Watkins, N., 2013. Estimating nitrate-nitrogen leaching rates under rural land uses in Canterbury (updated). Report R14/19 Environment Canterbury.

evidence that there was significant under-estimation in the measured load calculations at SH1. While there is clearly error in the measurements as a result of the sampling and calculation methodologies, and consequent variability from year to year, the variability is not such that the instream load could be more than twice the 770 tonnes calculated.

- 10.82 We do not accept, therefore, that errors in calculation of either the leaching loss, or the in-river load, could explain more than a small proportion of the difference.

Loss of nitrogen - attenuation

- 10.83 Evidence from Dr Scott, Dr Burberry and Mr Callander indicated that the various ways in which N could be attenuated are:

- (a) Soil retention
- (b) De-nitrification in soil
- (c) De-nitrification in groundwater
- (d) Instream loss, including by
 - (i) De-nitrification in riparian margins
 - (ii) Aquatic plant uptake
 - (iii) Nutrient recycling

- 10.84 We consider each mechanism in turn:

Soil retention

- 10.85 Soil retention is the incorporation of N into the soil. It is not true attenuation, as a portion of N is cycled in and out of the soil system, however it will result in long-term storage of N during the early stages of the NTFE proposal. Both Mr Brough and Dr Scott agreed this was only likely to be significant in the development phase of Balmoral. In our view, it will not result in the long-term ongoing reduction of N leached from the root zone.

De-nitrification in soil

- 10.86 Different soils have varying abilities to convert nitrate to gaseous nitrogen. Webb *et al.* (2010) describes the nitrogen attenuation ability of different soils types and notes that de-nitrification is most likely to occur in soils that are organic or poorly drained. The soil types on Balmoral, described by Mr Brough in his evidence-in-chief, do not fall into this category. Both Mr Brough and Mr Callander agreed that de-nitrifying soils are unlikely to be present on Balmoral in any significant quantity. We conclude that de-nitrification in soils on the property is unlikely to occur.

De-nitrification in groundwater

- 10.87 It was accepted by all witnesses who commented on the matter that de-nitrification in groundwater requires anaerobic conditions. Such conditions are present in some groundwater systems, particularly in the North Island, but are not generally present in the alluvial aquifers in Canterbury. Groundwater sampling was undertaken in three wells on Balmoral in April 2014, and showed high levels of dissolved oxygen and no iron or manganese, indicating an oxygenated groundwater system. This reflects samples taken from other wells in the surrounding area, as presented by Dr Scott. We conclude that the groundwater sampling shows no sign of de-nitrifying conditions beneath Balmoral and therefore that de-nitrification in groundwater is unlikely to occur.

Instream loss

De-nitrification in riparian margins

- 10.88 As with groundwater, de-nitrification in streams and rivers generally occurs in anaerobic conditions. Such conditions may be present in wetlands, or in Mr Callander's view, in the silty margins between groundwater and surface water. We heard evidence that wetlands were or are present along the riparian edge of Balmoral. There are almost certainly wetlands elsewhere within the catchment, particularly in the undeveloped areas. We received no evidence on the extent to which such areas may contribute to de-nitrification. Dr Kilroy commented that de-nitrification has been demonstrated in the sediments of well-oxygenated rivers (such as the Hurunui). However, she commented that data from another streams in New Zealand suggested that instream de-nitrification is likely to account for only a minor proportion of total N loss.

Aquatic plant uptake

- 10.89 Dr Kilroy noted that research has established that instream nutrient uptake is variable and can be significant in reducing nutrient concentrations in streams. She calculated the removal of N within the Hurunui mainstem using conservative uptake rates (that is, rates at the high end of the published range), and estimated that under low flow conditions the maximum percentage of nitrate removal was 0.25% at SH7, and 0.01% at SH1. She commented that:

"These results seem at odds with the results of many experimental and instream studies, which have demonstrated very efficient stripping of nutrients from the water column. The discrepancy can be explained by the fact that most uptake studies have been carried out in very small streams or small experimental channels.

*... I note that decreasing efficiency of nitrogen uptake as nitrate concentrations and stream size increase is well documented."*²⁷

- 10.90 From this we take that, while N uptake in the Hurunui mainstem is likely to be relatively small, loss in smaller streams within the catchment may be significantly greater.

Nutrient recycling

- 10.91 Dr Brown indicated that nutrient recycling – that is, the taking and using of water high in nutrients for irrigation from the tributary streams – may account for some N removal. This was not quantified, although Dr Brown commented that it might be in the order of 10-30%.
- 10.92 The best information we have regarding instream loss of N within the catchment was from Dr Brown, who presented evidence comparing the measured loads in the tributaries at the confluence with the Hurunui mainstem, to the measured load at SH1. His analysis showed that approximately 10% of the N load from the tributaries (70 tonnes N / year) is removed in the mainstem between SH7 and SH1. This is consistent with the research paper by Elliot (2005) that estimates that between 75 and 100% of the N load is delivered to the coast (that is 0 to 25% loss) in larger rivers, including the mainstem of the Hurunui.
- 10.93 Dr Brown's evidence also analysed N loss in the tributary streams that pass through the Amuri Basin. Using ECan's look-up tables and adjusting the drainage to better reflect actual drainage, he estimated a root zone loss within the basin of 948 tonnes per year. This compares with a measured load at the mouths of the tributaries of 394 tonnes/year, that is, a loss of 58% of the N.
- 10.94 This is a significant loss, and while the mechanism is not clear (it could be a combination of any of the three factors discussed above) such loss in tributaries could explain the bulk of the overall catchment loss. A similar figure is contained within the Elliot (2005) paper -

²⁷ Dr C Kilroy's evidence in chief, paragraphs 55 and 56, p 12 and 13.

while estimated losses in the mainstems of river were relatively small (0 to 25%), losses over the country as whole were in the order of 55%, suggesting that the bulk of the loss is occurring in areas drained by smaller streams. It is also consistent with Dr Kilroy's evidence, which is that nutrient uptake is variable and can be significant in reducing nutrient concentrations in smaller streams.

Conclusion on attenuation mechanism

- 10.95 Given the discussion above, we think the most likely explanation for the measured catchment-wide N loss is in-river loss, primarily in tributary streams, with a smaller but measurable loss within the Hurunui mainstem.

Attenuation factor

- 10.96 We now return to the question of what attenuation factor should be applied to the NTFE proposal. Firstly, we accept that there is a 50%+ loss in N on a catchment wide scale within the Hurunui catchment. This is corroborated by published research and modelling that shows this is typical within catchments both in NZ and overseas. There are also several sources of information that indicate that the percentage loss of N within small tributaries can significantly exceed that of larger rivers.
- 10.97 A range of attenuation factors clearly apply within a catchment, depending on whether the nutrient is likely to pass through smaller streams, or only via a large river, and of course the distance covered between the source and the coast. It is therefore to be expected that the percentage loss in some tributary streams or from some parts of a catchment will exceed 50%, perhaps significantly, and in others, close to the coast or in large rivers, will be less.
- 10.98 As discussed earlier, Dr Brown's Table 4 shows an average loss of 58% is occurring in the tributaries in the Amuri Basin. It is not unrealistic to expect that the percentage loss in tributary streams where the load is lower (the Amuri tributaries have very high concentrations of nutrients) may be even higher.
- 10.99 Drainage from Balmoral to the Hurunui River is via groundwater and does not pass through any small streams. From all the information we have received, it is only likely to be subject to attenuation within the mainstem. The best information we have is that losses in the mainstem are in the order of 10%.
- 10.100 Mr Callander's view was that, despite the lack of clarity as to the cause of N loss:

"The accepted methodology of quantifying soil leaching losses results in significantly higher numbers than are measured at SH1. That difference must be allowed for when considering the potential effects of any land use change on the surface water ways".

- 10.101 For this application we disagree, and conclude that in relation this application N loss of 10% is most likely. An attenuation factor of 0.1 is therefore appropriate.

Conclusion on whether load limit will be breached

- 10.102 Given the available headroom of 52 tonnes, the predicted loss of at least 270 tonnes N per year at full development, and assuming an attenuation of 0.1, then we find, for the reasons given, that full dairying development as proposed by NTFE will breach the N load limit at SH1.
- 10.103 However, development is staged with N losses increasing each year, and an alternative development of dryland farming was included within the application as amended by the applicant. Consideration of whether a reduced area of development or a reduced development proposal could proceed is therefore required.
- 10.104 At closing, Mr Jansen provided a table showing proposed development on Balmoral at two-yearly intervals, and the predicted N loss at each stage. This includes the most

recent OVERSEER™ loss predictions. The first few years are reproduced below, with an attenuation factor 0.1 included:

Landuse (Ha)	2012	2014	2016	2018
Dryland farming	3,077	1,105	449	464
Irr. Dairy	-	1,641	2,173	2,537
Irr. Wintering	-	302	400	485
Irr. Replacements	-	609	807	978
Forestry	4,837	4,257	3,787	3,207
Natives	682	682	979	979
Total Hectares	8,596	8,596	8,596	8,596

N loss (tonnes per year)	2012	2014	2016	2018
Dryland farming 13.5 kg/ha	42	15	6	6
Irr. Dairy 39.5 kg/ha	-	65	86	100
Irr. Wintering 46.8 kg/ha	-	14	19	22
Irr. Replacements 26.5 kg/ha	-	16	21	25
Forestry 1.1 kg/ha	5	5	4	4
Natives 1.1 kg/ha	1	1	1	1
N loss (tonnes / yr) at property	48	115	137	158
N load at SH1 (attenuation 0.1)	43	103	123	142

10.105 NTFE also predicted the nitrate loss resulting from a conversion to dryland farming only,

Landuse (Ha)	2012	2014	2016	2018
Dry (beef finishing)	3,077	2,377	2,683	3,060
Dry (dairy support)	-	1,208	1,444	1,647
Forestry	4,387	4,257	3,787	3,207
Natives	682	682	682	682
Total Hectares	8,596	8,596	8,596	8,596

using as an example a combination of beef finishing and dairy support. This gives the following N loss:

N loss (tonnes per year)	2012	2014	2016	2018
Dry (beef finishing) 26.9 kg/ha	83	64	72	82
Dry (dairy support) 33.6 kg/ha	-	43	49	5
Forestry 1.1 kg/ha	5	5	4	4
Natives 1.1 kg/ha	1	1	1	1
N loss (tonnes/yr) at property	89	112	126	142
N load at SH1 (attenuation 0.1)	80	101	113	128

- 10.106 Clearly, with either the full dairying development option, or the example dryland farming system above, the available load of 52 tonnes will be exceeded prior to the end of 2014.

Will the NTFE proposal comply with Policy 5.3 (a) – Chlorophyll a and filamentous algae in the mainstem of the Hurunui River?

- 10.107 Excess periphyton growth can adversely affect recreational, cultural and amenity values. Objective 5.1(c) is to manage water quality to control such growth. Excess periphyton growth can also alter habitat and water quality and adversely affect invertebrates and fish. Ms Solomon advised that Ngāti Kurī have a particular concern with cyanobacterial blooms affecting the river.
- 10.108 The factors affecting periphyton abundance and cover are numerous and include sunlight, water temperature, and grazing by invertebrates. Dr Kilroy advised that the most important factor determining periphyton growth is nutrient concentration. The most important factor in removing periphyton is high flows. Provided nutrients are present, growth tends to accumulate in periods of stable, low flows, typically occurring in mid to late summer.

Current situation

- 10.109 Chlorophyll a is a measure of all periphyton growth in the river, and it is the only measure that allows the growth of cyanobacteria mats to be assessed. Chlorophyll a data does not appear to be routinely collected, and we were advised by Dr Kilroy that only two years data from SH1 is available. She considered this data insufficient to draw any conclusions from in relation to the current state or trend of periphyton growth.
- 10.110 As an alternative, Dr Kilroy calculated the 'Weighted Composite Cover' (WCC) of periphyton within the river, an index based on visual estimates of cover of both mat and filamentous type algae. Having determined that 120 mg/m² of Chlorophyll a corresponds to a WCC of 20, the Chlorophyll a dataset could effectively be extended back to 1989.
- 10.111 Using this dataset, Dr Kilroy calculated 95th percentile data for both filamentous algae and WCC using averages calculated over both two and five years. Considering the 95th percentile data calculated over two years (this being the closest to the 2.5 years used in the Hazen methodology discussed above), the Chlorophyll a limit at SH1 was exceeded in 1995/1996, between 2001 and 2004, 2005/2006, and again in 2013. Community & Public Health also advised that there have been toxic algal blooms at SH1 in four of the last five years, despite Chlorophyll a apparently not reaching the HWRP's trigger of 120 mg/m².
- 10.112 Filamentous algal cover is assessed visually at SH1. Again using Dr Kilroy's 95th

percentiles calculated over two yearly periods, the limits were breached between 2001 and 2003, and from 2005 to 2007. Dr Kilroy's graphs show the significant variability in the data, from 0 to 50% cover during the period of record. In 2012 – 2013 the percentage cover was between 10 and 15%, compared to the HWRRP limit of 20%.

Effect of the application

- 10.113 We concluded earlier that the application will result in N leaching into groundwater and then into the Hurunui River. There is also the potential for small quantities of P to leach into the Hurunui River in the same area. Due to the direction of groundwater flow under the site, dissolved nutrients will generally emerge into surface water between the SH7 bridge and the confluence with Dry Stream. We note also that below Dry Stream the concentrations of both N and P in the river increase, primarily due to inputs from the Amuri Plain, via the tributary streams that drain that area.
- 10.114 As discussed earlier, the approach of the HWRRP is to manage the risk of increased periphyton growth by fixing the P concentration at the 2012 level, while allowing an increase in N discharge, on the basis that the Hurunui River is generally P limited.
- 10.115 Dr Meredith highlighted, however, that while this is a reasonable approach for filamentous algae, which was the primary concern during the time the HWRRP was being developed, cyanobacteria, and in particular *Phormidium* (which has become an increasing problem over recent years), thrives in high N concentrations and low P concentrations. Increasing N concentrations therefore have the potential to increase *Phormidium* growth, even if P concentrations remain stable.
- 10.116 Periphyton growth can be limited when the concentration of one or other nutrient is less than (in relative terms) the concentration of the other. For filamentous algae, the necessary ratio is 7N:1P. If there is more than 7 units of N for every unit of P, then P is said to be limiting, and further growth will only occur if more P is added to the system. If there are less than 7 units of N for every unit of P, then N is limiting. Studies on the concentration of N and P at different points in the river, together with nutrient diffusing substrate (NDS) assays can identify which, if any, nutrient is limiting.
- 10.117 NDS studies were carried out in the Hurunui River by both ECan and NIWA and were summarised by Dr Kilroy. At SH7 the studies gave different results, suggesting that at different times both N and P can be limiting. N was limiting in late summer in the ECan assays, while P was limiting (with secondary N limitation) at the same time of year in the NIWA study. Downstream of Balmoral, close to the confluence with Dry Stream, the N concentration was much higher and there was a strong P limitation.
- 10.118 It is between these two sites that most, or all, of the N leached as a result of the application is likely to enter the Hurunui River. Any P leached would also enter in this area. Dr Kilroy's conclusions were that due to the strong P limitation below Balmoral, adding additional N would not result in any increased growth of filamentous algae, particularly in late summer, typically a period of high growth due to warm temperatures and low stable flow. Growth of cyanobacteria, including *Phormidium*, could however increase.
- 10.119 At SH1, the NDS assays resulted in equal growth of periphyton whether N, P or neither nutrient was added. Dr Kilroy interpreted these results as showing that the water was saturated with both N and P in terms of periphyton growth, and adding neither would stimulate additional growth.
- 10.120 Conversely, Dr Meredith considered that this showed that neither nutrient was limiting. In response, Dr Kilroy commented that the growth rates shown were the highest she had seen in similar experiments, suggesting very rapid growth rates on all treatments, and that other studies had shown maximum growth rates (i.e. saturation) for diatom communities at P concentrations of 0.0005 to 0.005 mg/L. The concentration at SH1 is at or close to 0.0044 mg/L. Dr Kilroy noted that while other studies have shown peak Chlorophyll a growth at P concentrations of up to 0.025 mg/L, the increase in peak biomass was small. For example, the maximum Chlorophyll a growth at 0.01 mg/L was

only 8% greater than that at 0.004 mg/L.

- 10.121 Dr Kilroy concluded that an increase in P concentration up to and beyond the HWRRP limit of 0.0044 mg/L would have minimal effect on peak periphyton biomass at SH1, and upstream as far as the Dry Stream confluence.
- 10.122 As an expert with significant experience in the study and management of periphyton, we generally accept Dr Kilroy's evidence. From this we make the following conclusions:
- (a) Discharge of N from Balmoral between SH7 and Dry Stream may result in increased periphyton growth in late summer, as different studies have shown both nutrients to be limiting at this time. We note that Dr Kilroy concluded that increases in N would be unlikely to stimulate general periphyton growth (i.e. filamentous algae), however we cannot reconcile that conclusion with the evidence that N is sometimes limiting in late summer at SH7. Any increase in N at that time of the year must therefore have the potential to increase filamentous algal growth;
 - (b) An increase in N between SH7 and Dry Stream may stimulate *Phormidium* growth, as this responds to high nitrate concentrations;
 - (c) Any discharge of P from Balmoral may increase growth rates between SH7 and Dry Stream;
 - (d) Below Dry Stream, additional N inputs will not affect filamentous algae growth due to the strong P limitation. Additional P is also likely to have little effect on growth, as concentrations appear to be at or close to saturation (in terms of algal growth);
 - (e) The risk of increased growth of cyanobacteria growth downstream of Dry Stream is low due to the existing high concentration of N; and
 - (f) At SH1, concentrations of both nutrients are sufficiently high such that any increase is unlikely to cause an increase in periphyton growth.
- 10.123 Dr Kilroy also presented analysis showing that as P concentrations increase, the accrual period for filamentous algae cover to reach the HWRRP limit of 20%, reduces.
- 10.124 Our overall conclusion is therefore that nutrient discharge may increase periphyton growth. The greatest risk is for cyanobacterial growth in the reach between SH7 and Dry Stream, but potentially there may also be an increase in filamentous algae in this reach at certain times.
- 10.125 The HWRRP is concerned with controlling managing nuisance growths of periphyton, not preventing periphyton growth altogether. The Policy 5.3(a) limits apply throughout the mainstem of the Hurunui River, including the reach between SH7 and Dry Stream. No data on periphyton cover has been presented (presumably none is available) for SH7, however the WCC data show that at times the limits have been breached concurrently at Mandamus and SH1. It is reasonable to assume therefore that at these times the limit would also have been exceeded at SH7. It appears likely, therefore, that an increase in periphyton growth due to this application will increase the likelihood of breaching Policy 5.3 (a) in future.
- 10.126 Dr Cowie highlighted that there was very limited public access to this stretch of the river, and consequently that the effects of any increase in periphyton growth are likely to be strongly constrained. Access to the river at this site is possible by kayak or jet boat, however there are clearly likely to be far fewer people using this stretch than in the more accessible areas. Dr Rankin for Whitewater NZ indicated it was not a stretch of the river commonly used by kayakers. We accept that this may reduce effects on people in terms of amenity values, and the effects on toxins on dogs, however it does not mitigate the effects of increased periphyton growth on mauri or instream values.

- 10.127 We also accept Dr Kilroy's evidence that accrual periods are largely controlled by flows, and provided the frequency of flows of at least twice the median flow are maintained, periphyton will continue to be removed from the river. The application will not affect the flow regime in the Hurunui River.

Microbial contamination

- 10.128 Objective 1 of the HWRRP is that people and communities have ready access to high quality and reliable supplies of drinking water. Microbial contamination of ground and surface water and subsequent effects on drinking water quality were discussed in the evidence of Dr Humphrey of Community and Public Health.
- 10.129 There are four drinking water supplies downstream of Balmoral which take water primarily from the Hurunui via a gallery or bore close to the river. Three (Kaiwara, Hurunui #1, and Blythe) are community drinking water supplies and the other is the drinking water supply at the Balmoral recreation ground, which is heavily used during the summer period.
- 10.130 None of these have treatment capable of removing protozoa or cyanobacteria and their toxins. Dr Scott considered there was an increased risk of contamination of shallow drinking water wells on Balmoral following heavy rain, which could wash microbes through the soil and into groundwater.
- 10.131 Mr Brough described how microbial contamination is removed or attenuated in the soil prior to leachate entering groundwater. Webb (2010) describes the soils on Balmoral as having low microbial leaching vulnerability, that is microbes are likely to be retained within the soil and not enter groundwater. Mr Brough also cited a study that showed that dairying at trial sites in Canterbury using spray irrigation with centre pivots had minimal impact on the number of microbes within groundwater.
- 10.132 Dr Moriarty, for Community and Public Health, confirmed that microbial contamination generally occurs by overland run-off or direct contamination of waterways by cows, rather than by passage of contaminants through the soil into groundwater. The riparian setbacks proposed by NTFE have been discussed earlier in relation to phosphorus loss. Given these setbacks and the flat topography of Balmoral we are confident that overland flow and direct contamination by stock will not be an issue in this case.
- 10.133 We consider that the risk of microbial contamination of groundwater and the Hurunui River is very small. If any *E. coli* is detected in the well at the recreation ground, NTFE will deepen the well or provide an alternative water supply.

Other contaminants

- 10.134 Mrs Snoyink and Ms Demeter raised the issue of contamination by other substances associated with farming operations, including bovine oestrogen, pesticides and heavy metals. These contaminants have been found in various quantities in a study on the Rangitata River, some at levels "*high enough to cause concern*".
- 10.135 Dr Meredith commented that while such contaminants are present, they are not generally measured. The management of such contaminants is focussed on managing another soluble indicator contaminant such as nitrate – the trend in nitrate concentration is likely to reflect trends in other soluble contaminants. Therefore, provided nitrate concentrations do not increase significantly, it is expected that concentrations of other contaminants will also be appropriately managed.
- 10.136 For contaminants that are not easily soluble and are more likely to enter the water via overland flow, our conclusions in relation to overland passage of phosphorus and microbial contaminants apply.

Conclusion on water quality issues

- 10.137 We conclude, from the above, that the N load limit will be exceeded if the NTFE preferred option of full development, including 7,000 ha under irrigation and dairying, proceeds. There is also a risk that the P concentration limit will be exceeded, although we believe this can be managed through conditions. This risk increases as the amount of land converted to dairying increases. It also appears likely to us that full development of Balmoral will increase the likelihood of the periphyton standards being breached.
- 10.138 We conclude that consenting the highly developed proposal will not protect the existing values of the mainstem of the Hurunui River. Because of our findings relating to exceedance of the N load limit we do not think that the mauri of the mainstem would be protected. We also conclude that the effects of the highly developed proposal would not control periphyton growth, which would adversely affect cultural, recreational, and amenity values.
- 10.139 As we interpret and apply the policies, the HWRRP requires us to protect those existing values, uses, and mauri at the same time or while allowing for an increase in irrigation. Critically, we can only support an increase in irrigation under the clear direction contained in the policy that any increase will not result in a breach of the water quality limits set out in Policy 5.3 and the nitrogen load limits set out in Schedule 1. We are not satisfied based on the reasons set out above that the effects of the preferred NTFE highly developed proposal will comply with those water quality limits and nitrogen load limits.

Other relevant planning provisions – s 104(1)(b) RMA

- 10.140 In the above section we have addressed the actual and potential effects and the relevant provisions of the HWRRP as they relate to NTFE's preferred full development change of land use application. We now move on to discuss any other relevant planning provisions as they relate to NTFE's preferred full development change of land use application.
- 10.141 Between them both, Mr Cowie and Ms Burbidge identified and comprehensively covered relevant provisions of regulations, national and regional policy statements, and regional plans.

National Environmental Standards

- 10.142 Mr Cowie explained that there were no national environmental standards directly relevant to the NTFE applications. We accept that.

Regulations

- 10.143 We have already commented earlier on the National Environmental Standard for Sources of Human Drinking Water, that matter needs no further comment.

National Policy Statements

- 10.144 The National Policy Statement for Freshwater 2011 (NPS) is relevant and we must have regard to the NPS in reaching our decision on the NTFE proposal.
- 10.145 The NPS covers water quality within its Part A and water quantity within its Part B. Under s 62(3) RMA, the Canterbury Regional Policy Statement must give effect to the NPS. Also, we note that the HWRRP also gives effect to the requirements of the NPS to set long term objectives and limits, relevantly, for both water quality in the Hurunui River and environmental flows in the Waiau River.
- 10.146 Mr Cowie was of the view that the NTFE proposal was consistent with the relevant provisions of the NPS, in particular Objective 1, as the applications to use water and to change land use on Balmoral recognise the life-supporting capacity and ecological values of the Hurunui River and seek to sustainably manage any potential effects caused by N and P loss, and subsequent migration to the Hurunui River.

- 10.147 Given the findings we have made on the effects of the NTFE proposal, we disagree with him for reasons already advanced. In our view, the NTFE fully developed proposal would be contrary to the NPS outcomes.

Canterbury Regional Policy Statement (CRPS)

- 10.148 Chapter 2 and Chapter 7 are the relevant chapters of the CRPS. The thrust of Chapter 2 is that water quality is to be maintained and, where required, enhanced. We agree with Mr Cowie when he said this particular outcome has been give effect to in the operative HWRRP, which sets water quality limits in the Hurunui River and its main tributaries.
- 10.149 Chapter 7 provides for how freshwater resources in Canterbury will be managed. Again, we agree with Mr Cowie that the objectives and policies of the CRPS are embodied in the HWRRP, which provides for specific management of the Hurunui River.
- 10.150 The objectives within the CRPS are higher order objectives. For example, Objective 7.2.1 requires that the life-supporting capacity/mauri of freshwater is safeguarded, and this is provided for in Objective 2. It also requires there be provision of reasonably foreseeable needs for the community and stockwater supplies.
- 10.151 Objective 7.2.2 CRPS requires that water abstraction occurs in parallel with improvements in efficiency, the improvements of maintenance of water quality, and the restoration or enhancement of degraded waterbodies. This is provided within Objective 8.
- 10.152 Objective 7.2.4 CRPS requires the integrated management of freshwater resources, including the interconnectivity of surface and ground water. The effects of land uses and intensification of land uses on demand for water and water quality along with the consideration of net benefits of using water and the significance of these benefits for the Canterbury region. We agree with Mr Cowie when he says this CRPS objective is embodied into Objectives 3, 5.1, 5.2 and 8, and associated policies of the HWRRP.
- 10.153 We agree with Mr Cowie that Policies 7.3.6 and 7.3.7 of the operative CRPS are most relevant to the proposal. Policy 7.3.6 deals with freshwater quality and seeks to implement water quality standards for surface water and groundwater resources within the region. Those standards are set considering the values associated with maintaining life-supporting capacity, ecosystems processes, and indigenous species, including associated ecosystems and the natural character of the waterbody. Current and reasonably foreseeable requirements for water, along with recognition of the cultural significance of the freshwater body and any conditions or restrictions on the discharge of contaminants required to protect those values, are also to be taken into account. The policy requires management of activities, singularly or cumulatively, where they may affect water quality with the goal of maintaining water quality at, or above, standards set for that waterbody.
- 10.154 Policy 7.3.7 relates to water quality and land uses and seeks to avoid, remedy, or mitigate adverse effects of changes in land use on the quality of freshwater above surface and under the ground. Importantly, the policy seeks to control changes in land use to ensure water quality standards are maintained.
- 10.155 We agree with Dr Cowie's analysis that Policies 7.3.6(1) and 7.3.7(1) are met in the Hurunui and Waiau catchments via the provisions of the HWRRP, which we have mentioned above.
- 10.156 In relation to Policies 7.3.6(2) and 7.3.7(2), we agree as well that these provisions are given effect to by the HWRRP. However, we do not agree with him that granting consent to the NTFE proposal would be in accord with the relevant objectives and policies of the CRPS.
- 10.157 Given the close connection between the CRPS and HWRRP as described by Dr Cowie and accepted by us, it follows given our finding that the proposal is contrary to

Objectives 5.1, 5.2 and Policies 5.3(a) and 5.3(b) of the HWRRP, it will also be contrary to the provisions of the CRPS as we have identified them.

Other relevant matters

- 10.158 We have had regard to the Canterbury Water Management Strategy in a broad sense and accept as Mr Cowie told us that the vision and objectives of the CWMS have been embodied into the HWRRP.
- 10.159 We also record Mr Cowie drew our attention to a range of iwi management plans. It was his view that he found nothing in those iwi management plans that was strongly contrary to the provisions of the HWRRP.
- 10.160 Given the linkage described by Mr Cowie between the CWMS and the HWRRP and for the reasons already advanced, we conclude that the preferred NTFE fully developed proposal would not be in accord with the CWMS.
- 10.161 Again, based on Mr Cowie's view of the iwi management plans and his finding they are consistent with the HWRRP, we think the same conclusion would follow, namely that the preferred NTFE fully developed proposal would not be in accord with either the provisions of HWRRP or the iwi management plans.

Reduced development change of land use

- 10.162 Given the outcome we have reached in relation to the NTFE preferred highly developed option within the range of options that proposal provides for, we now turn to consider a lesser form or reduced form of development that may be available to NTFE on Balmoral.
- 10.163 We cannot be precise in describing all of the elements of a lesser or reduced form of development on Balmoral. What we can say is the reduced form or scale of development is limited in its extent or governed by the nutrient allowance available. This lesser or reduced form of development no longer requires consideration of Balmoral in two parts, namely Area A or Area B.
- 10.164 There are 52 tonnes of N 'headroom' available, before the HWRRP limit is reached. Assuming an attenuation factor of 0.1, 57.2 tonnes (52 x 1.1) could be lost from the root zone on Balmoral before the limit is reached. This equates to an average leaching rate across the whole Balmoral property of 6.6 kg N/ha/yr.
- 10.165 We note that NTFE estimated the nutrient loss as at December 2013 as being approximately 43.6 tonnes/year (5 kg N/ha/yr average across the property), although this figure has not been audited by ECan. A limit of 57.2 tonnes/year would allow little extra development on Balmoral, as demonstrated in the tables provided to us following the closing submissions.
- 10.166 To provide some examples, an average leaching rate of 6.6 kg N/ha/yr across the whole Balmoral property may allow the following alternative types of farming operations:
- (a) approximately half of Balmoral to be converted to dryland farming at a rate of 13.5 kg N/ha/yr²⁸, provided the remainder was in forestry or natives (1.1 kg N/ha/yr²⁹); or
 - (b) a maximum of approximately 1,500 ha of irrigated dairy support (33.5 kg N/ha/yr³⁰), provided the remaining 7,096 ha were in forestry or natives (1.1 kg N/ha/yr).
- 10.167 We consider that allowing this lesser level of development to take place is acceptable, provided there is appropriate monitoring in place and provision for ceasing or reducing

²⁸ From the table of nutrient losses provided in closing submissions.

²⁹ Ibid

³⁰ Ibid

development if any plan limits are breached or unacceptable adverse effects occur. To be clear, we are not limiting the type of development to those examples provided above. It will be for NTFE to determine its preferred farming system, provided that compliance can be achieved with the maximum nutrient allowance of 6.6 kg N/ha/yr across the whole Balmoral property.

- 10.168 At this lesser or reduced form of development, the risk of breaching both the P limit and the periphyton limits reduces significantly. The risk of P loss will be managed through the conditions discussed earlier. The greatest risk of increased periphyton growth is in the reach between SH7 and Dry Stream, however we think the risk will be low.
- 10.169 Given these significant changes, in our view the reduced proposal that is subject to the above nutrient allowance will comply with Policies 5.3 and 5.3B, and consequently ensure that Objectives 5.1 and 5.2 are met. This will mean that the effects we were earlier concerned about relating to existing values, uses, and mauri of the Hurunui River will be acceptable.
- 10.170 Given the interrelationship between the HWRRP, the CRPS, the NPS, the CWMS, and iwi management plans as we have earlier described it and given our finding that the reduced proposal is in accord with the key water quality objectives and policies of the HWRRP, then we also conclude that the amended proposal is in accord with the relevant objectives and policies of the CRPS, the NPS, the CWMS, and iwi management plans.

11 INSTREAM VALUES OF THE WAIU RIVER

- 11.1 Within this section we are considering under s 104(1)(a) RMA any actual or potential effects on the environment of allowing consent to take and divert water from the Waiau River as described in CRC132458 and secondly, under s 104(1)(b) RMA, any relevant provisions of national environmental standards, regulations, and plans.
- 11.2 Also within this section, again under s 104(1)(a) RMA, we consider any actual or potential effects on the environment, particularly on water quality of the Waiau River, from the discharge of fish screen return water as fully described in CRC142438 and secondly, under s 104(1)(b) RMA, any relevant provisions of national environmental standards, regulations, and plans.
- 11.3 Consistent with section 10 of this decision, we consider first NTFE's preferred option of full development of Balmoral.
- 11.4 As with the change of land use application, the critical plan is the HWRRP, which we focus on. Also, the interrelationship between the HWRRP, the CRPS, the NPS, the CWMS, and iwi management plans is also highly relevant when considering the water take and discharge activities.
- 11.5 The application is for diversion of up to 5.2 m³/s for the Waiau River, with 1 m³/s being returned to the Waiau River to allow fish passage past the intake structure. Up to 4.2 m³/s will be taken through the intake for use on Balmoral.
- 11.6 Objective 2 of the HWRRP is that water levels and flows in the Waiau River are sustainably managed to avoid significant effects on, and avoid, remedy or mitigate other adverse effects on, a number of values. These are mauri, instream aquatic life, fish passage, landscape and amenity values, breeding success of river birds, river mouth opening, periphyton accumulations and recreational values.
- 11.7 Objective 2 is given effect to by inclusion in the HWRRP of an Environmental Flow and Allocation Regime. This sets allocation limits for A, B and C permits, and minimum flows that apply to those permits. The objective is implemented by a number of policies. Policy 2.1 is unequivocal: no resource consent to take, dam or use water should be granted if the proposed activity will cause the minimum flow to be breached, unless the take is for a community or stockwater supply.
- 11.8 There are two additional policies of particular relevance. Policy 2.5 requires that and take,

dam or diversion provides for flow variability above the minimum flow, including flows that are between 1.5 and 3 times the median flow, in order to scour and flush periphyton and cyanobacterial accumulations, mobilise bed sediment, trigger flow-dependant life-cycle processes, and provide for recreational values within the Waiau River. Policy 2.6 is to ensure that any new take, dam, diversion or discharge protects the mauri of the Waiau River. Section 1.4.2 of the HWRRP describes how the minimum flows were set to allow for more water to be taken while ensuring that the life-supporting capacity and mauri of both the Hurunui and Waiau Rivers are protected.

11.9 Objective 3 is to allocate water to enable further economic development while meeting various environmental criteria. These include protecting the mauri of the Hurunui and Waiau Rivers, achieving water quality outcomes, providing for flow variability, managing water temperature, protecting fish passage, maintaining navigability of the river by jet boat and kayak, and protecting natural character. In addition, the objective seeks to protect the reliability of supply for existing abstractors.

11.10 Policy 3.1 sets the allocation limits in the Environmental Flow and Allocation Regime by which these outcomes will be achieved. Policy 3.2 is that no resource consent to take, dam, divert or use water will be granted if the proposed activity will cause the allocation limits to be exceeded at any point on the Waiau River at any time. Section 1.4.3 of the HWRRP describes how the allocation regime works. We note the following statement:

"There is a high level of confidence that the B permit allocation is set at a size which protects instream values".

11.11 NTFE's proposal is designed to comply with both the minimum flow and allocation limits. It is primarily a B permit, as the A allocation is full, with the option of utilising A permit water authorised to be used by AICL, at times that AICL do not require it.

11.12 Despite this, a number of submitters were concerned about the effects on the instream values of the Waiau River, and NTFE responded with evidence on these matters. This is discussed below.

Effects on fish and macroinvertebrate communities

11.13 Objective 2 (b), (c) and (f), and Objective 3 (d) and (e) are all concerned protecting fish and macroinvertebrate communities from the effect of reduced flows and water levels.

11.14 The Waiau River is home to seven fish species: longfin eels, torrentfish, upland bullies, Canterbury galaxias, koaro, brown trout and Chinook salmon. Mr Jowett for NTFE considered the effects of the NTFE proposal on the flow and sediment regime, water depths and velocities and the associated habitat for fish and benthic invertebrates. This was based on modelling work and considered two flow regimes – the status quo (including the pre-HWRRP minimum flows) and the flow regime under full development of the NTFE proposal the 'full development scenario', which included the NTFE take and the new HWRRP minimum flows for all existing takes (that is, an increase from 15 m³/s to 20 m³/s in February and March).

11.15 The full development option or NTFE's preferred proposal, including the NTFE take, has a small effect on the flow within the Waiau River. There is a reduction in median flow from 64.9 m³/s to 63.2 m³/s, and an increase in the 7-day mean annual low flow (7DMALF) from 19.3 m³/s to 21 m³/s.

11.16 The minimum flow of 20 m³/s would be exceeded 91% of the time under the full development proposal, compared to 94% of the time under the status quo. There would be an increase in the number of days per year below 20 m³/s, from 22.2 to 33.2, with an increase in the number of low flow events from 3 to 4.8 per year.

11.17 There would be small reductions in the average, depth, average velocity and total water surface width with the NTFE take, and an increase in daily maximum temperature of no more than 0.2 °C. Mr Jowett noted that the number of braids in the Waiau River did not change greatly over a range of flows, and the taking of 4.2 m³/s would not affect the

number of braids.

- 11.18 Measurements taken by Mr Jowett indicate that the minimum flow of 20 m³/s is sufficient to ensure salmon passage. Since these are the largest of the fish species present, we presume that passage for all other species will be possible.
- 11.19 The modelling of available habitat also showed minor changes in habitat availability. When flows are above 35 m³/s there will be a small increase in habitat; when flow are below the figure there will be a small decrease. For example, at low flows there will be an average loss of fish habitat of 2.3%, with greatest loss of habitat for species preferring high velocities, such as torrentfish.
- 11.20 Mr Jowett's opinion was that the changes, both positive and negative, would be so small they will have very little effect on fish and invertebrate populations. Changes in habitat will only affect a population when habitat is limiting. It is unlikely that this is the case at all times, and so small reductions in habitat are likely to have only a very minor effect on populations. Mr Jowett relied on an ECan report³¹ that flows of 20 m³/s will maintain river mouth opening, and hence provide for fish migration into and out of the Waiau River. He noted that river mouth closure is controlled by coastal processes and the frequency of floods and freshes, as well as the duration and frequency of low flows.
- 11.21 Several submitters were concerned about the effects of the increased take on the fish and invertebrate communities. These concerns included an increased risk of mouth closure, a reduced ability to wash fine sediment from the Waiau River, an increase in water temperature, potential loss of riparian wetlands and reduced fish passage.
- 11.22 We considered all these concerns were addressed satisfactorily by Mr Jowett and we agreed with his conclusions as discussed above.
- 11.23 Dr Meredith considered that since the application will comply with the HWRRP environmental flow regime, it is generally acceptable. We agree with that. His reservations were limited to the potential growth of cyanobacteria, which are discussed later.
- 11.24 He also commented that there should be a minimum depth of water maintained in the section of the Waiau River between the diversion into the fish pass and the discharge point back into the Waiau River. He noted that 0.24 m was often included as a condition of consent to protect minimum depth requirements for migrating salmon in Waiau River main braids. NTFE have proposed a similar condition, but in relation to the diversion channel, rather than the river itself. Policy 3.6 requires that habitat and fish passage for native fish and salmonids, and sufficient invertebrate production to support fish and bird communities, is maintained downstream of the point of take (diversion). We consider that a condition such as that proposed by Dr Meredith is appropriate for this application.
- 11.25 We accept Mr Jowett's and Dr Meredith's evidence on these matters. The NTFE proposal is in accordance with the HWRRP provisions and the minimum flow and allocation regime for the Waiau River has clearly been set for the purpose of (along with other considerations) protecting the instream community.
- 11.26 Because the NTFE proposal is in accordance with the HWRRP provisions for minimum flow and allocation regime, then any concerns raised by submitters relating to instream values of the Waiau River need to be considered against this outcome. It follows submitters' concerns will be addressed provided that the NTFE proposal operates in accord with these provisions. We are satisfied that the conditions promoted by NTFE will ensure this outcome.

Fish screening

- 11.27 Water will be taken from the Waiau River through the existing AICL intake structure. NTFE

³¹ Environment Canterbury 2010. Waiau River hydrological information. Unpublished report No. U10/11.

recognise that the screen needs to be upgraded to comply with Schedule WQN12 of the NRRP (contained within Schedule 4 of the HWRRP). Compliance with Schedule WQN12 is a condition of Rule 2.2, and current non-compliance with this condition is one of the reasons why the take is non-complying. Mr Jansen noted that initial designs for an upgraded intake have been prepared in consultation with ECan, the Department of Conservation, Fish & Game and Hugh Canard (representing kayaker safety issues).

- 11.28 NTFE proposed a condition of consent that requires the screen be upgraded to meet the Schedule WQN12 standard prior to NTFE taking more than 1,000 L/s of water through the intake. Dr Cowie explained that the delay was sought as a result of opposition from the landowners where the intake is sited to upgrading the intake, and disagreement on the scope of the easement governing works at that site. NTFE wishes to trial the new design at the AICL intake at Balmoral prior to installing it at the Waiau intake. From this we understand that NTFE wish to be able to start taking water and irrigating while issues over the easement are resolved.
- 11.29 Dr Meredith noted that fish salvage is currently required within the AICL scheme at the end of the season once taking water ceases, and additional abstraction through the existing screen is not appropriate. He suggested amended conditions to those proposed by NTFE, including detail of the performance standards to be met. He advised us that similar conditions have been attached to recent surface water take consents. We have accepted his recommendations and included them within the appropriate conditions.
- 11.30 In regard to the delay in installing than upgraded screen, he accepted that it may be pragmatic to wait until the amount of additional water taken was at a reasonable rate, however there was a risk that this may take some time, and the upgrade could therefore be delayed. He therefore proposed a time limit, as well as a rate limit, within which the screen must be upgraded.
- 11.31 We agree that a time limit is appropriate, and consider that the screen should be upgraded within twelve³² months of water first being taken, or prior to the take of 1,000 L/s, whichever is earlier. The existing fish screen is currently used by AICL, and we are satisfied that taking an additional 1,000 L/s for a limited period is likely to result in only minor additional effects on fish populations.

Effects on river bird communities

- 11.32 Objective 2(e) is to avoid significant adverse effects on the breeding success of riverbed nesting birds. The Waiau River is an important habitat for river birds, supporting breeding populations of a number of nationally endangered and vulnerable species, including black billed gulls, wrybills and black fronted terns.
- 11.33 Dr Sanders for NTFE advised that the diversity and numbers of birds present makes the Waiau River, and the Amuri Plains reach in its own right, significant habitats of indigenous fauna in terms of section 6 (c) of the RMA. Population size is primarily limited by predation, and to a lesser extent, floods.
- 11.34 Dr Sanders undertook surveys of the bird populations in relation to the Amuri Hydro Project and the HWRRP investigations and considers this information valid in relation to this application, as there have been no major changes to bird habitat conditions in the interim. In relation to this application, his evidence focussed on four aspects: the flood risk to birds, habitat suitability (especially weed invasion), food availability, and predation risk.
- 11.35 Dr Sanders' view was that the NTFE proposal poses no flood risk to birds, as it will have no or negligible, effect on floods. Similarly, weed invasion will not be exacerbated by changes in flows, as almost all weed-clearing floods occur at flows much greater than 210 m³/s, which are unaffected by the NTFE proposal.
- 11.36 In terms of food availability, Dr Sanders concluded there would be nil or negligible effects,

³² CRC132458, Condition 8.

based on Mr Jowett's conclusions that there will be very minor effects, both positive and negative, on fish and invertebrate populations within the Waiau River as a result of the NTFE proposal. He noted that there is the potential that the irrigated pasture may provide an additional or alternative food supply for some species, although that is unlikely to affect the population size, which is primarily controlled by predation.

- 11.37 Dr Sanders considered that there would be no change to the deterrent effect of river braids on mammalian predators, in relation to birds nesting on islands. This is based on Mr Jowett's modelling, which showed that there would be no change to the number of braids, and only very small (< 2%) changes to wetted width. In a survey carried out by Dr Sanders in December 2011 the majority of birds were nesting on island habitats, however these island were large and well vegetated and likely themselves to support resident mammalian predators.
- 11.38 Submitter Linda Laing was concerned about the incremental, cumulative effects of many consent takes on the Waiau River on the breeding success of black billed gulls, which nest close to Waiau township. Her particular concerns related to decreased water flows leading to increased predation and silting up of the riverbed leading to increased weed growth and loss of open gravel riverbed.
- 11.39 Nick Ledgard, from Braid Inc, highlighted the declining and threatened status of many species, and the lack of monitoring and interventions to improve breeding success. While he generally agreed with Dr Sanders that the impact of the NTFE application on its own is likely to be small, he was also concerned with cumulative effects. He considered NTFE should undertake monitoring of breeding populations and measures such as predator control to assist the populations. He described how predator control had been effective in the Ashley River to halt a decline in numbers.
- 11.40 Overall, notwithstanding the concerns expressed by the submitters in relation to possible effects on river bird communities, we accept the evidence and opinions of Dr Sanders on that matter. This is because he has significant experience and expertise in assessing impacts of activities upon such river bird communities.

Effects on periphyton growth

- 11.41 Objective 2(g) is to avoid significant adverse effects on the extent of periphyton and cyanobacteria accumulations, and the impact of those on recreational activities. The application has the potential to affect the amount of periphyton in the Waiau River by reducing river flows which flush out excess periphyton growth.
- 11.42 Dr Meredith identified that the Waiau River was more likely to grow mat type periphyton growths than filamentous algae. Such growths have been evident in areas of localised nutrient enrichment, but are not currently a widespread issue as the Waiau has low nutrient concentrations and a high flow regime. Dr Meredith considered that proliferations of algae are only likely in the lower reaches below intensified areas and at sustained periods of low flow. Compared to other rivers in Canterbury, the risk of proliferations are low.
- 11.43 Mr Jowett modelled the proportion of the Waiau River habitat suitable for diatoms (whose habitat preferences are similar to cyanobacteria) and showed that there would be a small decrease in habitat suitability as flows decreased as a result of the application. The effect of flow reduction on cyanobacteria growth will therefore be minor and likely to be positive, rather than adverse.
- 11.44 Policy 2.5 requires all takes to:

"Provide for flow variability above the minimum flow, including flows between 1.5 and 3 times the median flow, to scour periphyton and cyanobacteria accumulations..."
- 11.45 NTFE has proposed a condition that requires that if the take exceeds 2,500 L/s and if the flow at Marble Point exceeds 110 m³/s for more than six hours, then the take shall

cease for 24 hours. 110 m³/s is 1.5 times the median flow at Marble Point.

- 11.46 The intent of the condition is clear. However in practice little will be achieved if this consent is the only one operating under such a restriction, as the flow in the Waiau River will simply increase at these times from 110 to 112.5 m³/s. Mr Jowett points out that this will have a very small effect on velocity (0.04 m/s) and this will be insufficient to cause any significant increase in the 'flushing power' of the Waiau River.
- 11.47 Mr Jowett describes flows of greater than 150 m³/s as 'minor flushing events' and flows of 200 m³/s or greater as flushing events. NTFE is proposing to cease taking water at flows of 210 m³/s. The cessation of take will also have no effect on the frequency of floods and freshes, which determine the length of low flow periods.
- 11.48 However, if all other permits were subject to a similar restriction, the effect on flows would be considerably greater and additional periphyton scouring may occur. For that reason we support the condition, and hope that it sets a benchmark for future consents and the review of existing consents. We have amended the condition to take into account the reduction in rate of take associated with the reduced development proposal, as discussed later in this decision.

Effects on recreational values

- 11.49 Objective 2(h) is to avoid adverse effects on recreational values in the main stem of the Waiau River, for activities including salmon and trout fishing, kayaking, jet boating and swimming. Objective 3(g) is to allocate water while maintaining the ability to navigate the Waiau River by jet boat and kayak.
- 11.50 The effects of the take of water on recreational use of the Waiau River include reduced flow and water levels, the effects on fish populations, increased microbiological contamination affecting recreational water use, and the potential for increased periphyton growth.
- 11.51 The effects on fish populations and fish passage are discussed above, with the conclusion that the effects will be minor. Likewise, the effects on periphyton growth are discussed above and are considered to be minor. Since the water will be used within the Hurunui catchment rather than the Waiau, we are satisfied there will be no risk of microbial contamination as a result of the NTFE proposal within the Waiau catchment.
- 11.52 Mr Jowett considered the effect on water levels, particularly in relation to jet boat passage. He determined that all but one part of the Waiau River could be negotiated by jet boat at a flow of 15.1 m³/s, although that depended on the type of boat used and the skill of the driver. The remaining section would be negotiable at flows of 23 m³/s. The A permit minimum flow is 20 m³/s, and flows are not reduced by abstraction below this level. The average change in water depth directly resulting from the NTFE take would be 0.03 m.
- 11.53 We heard from Robin Gray, who described the flows at which jet boating was safe within the Waiau River. In his experience, jet boating begins to become difficult at flows below 34 m³/s, and flows should be above 40 m³/s to be safe. Low flows typically occurred from January to March.
- 11.54 We consider that while there are effects on jet boat passage at the lowest flows, this will generally occur at times when NTFE is not taking water, as it is unlikely to have access to AICL's A permit takes during the peak of summer. Low flows are due both to natural flow recession as well as A permit takes.
- 11.55 We note that Whitewater NZ did not submit on the take from the Waiau River. Dr Rankin's evidence notes that discussions were held with NTFE in regard to safety aspects at the intake. We heard no evidence that the take will have any effect on kayaking use of the Waiau River and so presume that this is not an issue.
- 11.56 Overall, we consider the effects on recreational values to be minor.

Effects on mauri

- 11.57 Objective 2(a), Policy 2.6 and Objective 3(a) are all to protect the mauri of the water bodies within the catchment. Section 1.4.2 of the HWRRP states that waterways such as the Waiau River represent the blood vessels of papatuanuku³³ and therefore have a key role in providing nourishment to all living things.
- 11.58 The HWRRP goes on to state that:
- "The elements of physical health which Ngāi Tahu use to reflect the status of mauri include;*
- *Aesthetic qualities such as water clarity, natural character, and indigenous flora and fauna;*
 - *Life supporting capacity and ecosystem robustness;*
 - *Depth and water velocity;*
 - *Continuity of flow from the mountains to the sea;*
 - *Fitness for cultural usage; and*
 - *Productive capacity."*³⁴
- 11.59 The HWRRP seeks to protect mauri through the implementation of the environmental flow and management regime.
- 11.60 Ms Solomon gave evidence for NTFE on behalf of Ngāti Kurī, the papatipu rūnanga³⁵ based in Kaikōura, within whose takiwā³⁶ the Waiau River is included. Ngāti Kuri was involved in the preparation of the Zone Implementation Plan, which led to the preparation of the HWRRP. The key issues for the rūnanga in relation to the take from the Waiau River are protection of the quantity of water within the river, including maintaining flow variability, freshes and floods, and ensuring that mahinga kai³⁷ is safe to harvest. The rūnanga promote the restoration of the ecological health and biodiversity of the hapua.³⁸ These matters are provided for by the HRWWP.
- 11.61 The rūnanga, along with Ngāi Tūāhuriri and Te Rūnanga o Ngāi Tahu, worked with Ngāi Tahu Property to establish a Manawhenua Working Party, to work on water issues in the Hurunui Waiau Zone. The group meets regularly with Mr Jansen.
- 11.62 Ngāti Kurī identify the Waiau River as being under pressure from water abstractions and intensive land use, with cumulative effects of abstractions on flows and water quality effects from farm run-off impacting on the health of the river. However they consider that the volume of the proposed take is small, and is an acceptable trade-off, when considered together with plans to upgrade the existing AICL scheme and the reduced pressure on the Hurunui River.
- 11.63 In response to questions about whether the HWRRP environmental flow regime would achieve the outcomes sought by Ngāi Tahu for the Waiau River, Ms Solomon considered that while Ngāti Kurī would prefer that minimum flows were increased, this would not avoid the natural low flows that occur each year. In her view, the extent to which the cyanobacterial blooms are natural occurrences during extended low flow periods or are enhanced by increased levels of nutrients remains unclear.
- 11.64 Ms Solomon described 'best practice' from NTFE as resulting in clean rivers with bountiful eels, native fish, and watercress that is safe to eat, bird habitat and food, and native fauna

³³ "Earth mother" (<http://www.maoridictionary.co.nz/>).

³⁴ Section 1.4.2, page 6, HWRRP.

³⁵ Papatipu = "Ancestral land". Rūnanga = "Council, tribal council, assembly, board"

³⁶ "District, area, territory, vicinity, region".

³⁷ "Garden, cultivation, food-gathering places".

³⁸ "lagoon at the river mouth".

and flora on the banks. She considered what is there now was not good enough for the future, and the rūnanga have a responsibility to improve it for their children.

- 11.65 A cultural impact report will be prepared in the coming months to identify Ngāti Kuri expectations and opportunities for Balmoral.
- 11.66 In conclusion, the environmental flow regime in the Waiau River is not ideal from Ngāti Kuri's point of view and, in their view, existing land uses and water demand within the catchment impact on the health (and therefore presumably the mauri) of the river. However, Ngāti Kuri consider the volume of take small and find it acceptable given the benefits to the Hurunui River by lessening demand on that river. We acknowledge their view, as kaitiaki of the river, and conclude that the effects on mauri and the cultural values of the Waiau River are acceptable.

Effects on landscape and natural character

- 11.67 Objective 2(d) is to preserve existing landscape and amenity values. Objective 3(h) is to protect the natural character of braided rivers. Dr Cowie assessed the effects of the application on visual amenity, landscape and natural character in the application.
- 11.68 He considered that the Waiau riverscape is much modified by farming, existing structures and introduced plants, including willows, and so does not have high visual or amenity values or natural character. There are few places where the Waiau River is easily seen from the land; these are generally where roads cross the Waiau River and from Waiau township itself. He also commented that river perception research has shown that people cannot easily differentiate between quite large changes in flow. The flow change here is relatively small, 4.2 m³/s, and so he considered that people would be unlikely to detect the difference.
- 11.69 He concluded that the effects of the NTFE proposal on visual amenity and natural character were expected to be minor.
- 11.70 Ms Demeter was concerned in her evidence with potential loss of the braided character of the Waiau River. As discussed above, Mr Jowett concluded the NTFE proposal would have no effect on the number of braids in the Waiau River.
- 11.71 We agree that the effects of the NTFE proposal on its own will have negligible effects on existing landscape values and the natural character of the braided Waiau River. The cumulative effect of all takes in the A and B block were taken into account during the HWRRP development process and considered to be acceptable. We therefore conclude that the effect of the application on these matters will be minor.

Flow variability

- 11.72 Objective 3(c) and Policy 2.5 are concerned with maintaining flow variability within the Waiau River. Flow variability, particularly the maintenance of periodic high flows, is important for a number of reasons, including scouring of periphyton, removing fine sediment, triggering flow sensitive biological processes such as migration, and providing for recreational experiences including fishing and boating. The NTFE proposal to cease taking water at flows above 110 m³/s was discussed above, in relation to scouring of periphyton.
- 11.73 As concluded there, when considered in relation to this application alone, ceasing the take at high flows will have no real effect. However, if all other permits were ultimately subject to a similar restriction, the effect on flows would be considerably greater and the expected benefits would be more likely to occur. For that reason we support the condition, in the hope that it sets a benchmark for future consents and the review of existing consents.

Effect on other Waiau River users

- 11.74 Mr Cowie pointed out for us that New Zealand King Salmon (King Salmon) had submitted, raising concerns relating to the taking of water from the Waiau River, primarily that it

would affect water levels in the Rotherham Stream. King Salmon rely on that stream to feed its salmon hatchery at Rotherham. He told us that a hydrologist commissioned by NTFE had worked alongside King Salmon's consultant hydrologist, and they reached a conclusion that:

"There is no evidence that a further 5 cumec take at the AICL intake would meaningfully effect the Rotherham Creek flows and hence the ability of NZKS to operate the farm."

- 11.75 He also referred us to an email exchange with King Salmon, which appeared to confirm that King Salmon was satisfied that there was no evidence that NTFE's proposed water take would meaningfully affect Rotherham Stream's flows and hence its ability to continue to operate its salmon hatchery. We accepted that evidence when considering effects on other Waiau River users.

Effects on water quality on the Waiau River from discharge of fish screen return water

- 11.76 Ms Burbidge assessed the potential effects on water quality on the Waiau River from the discharge of the fish screen return water in her principal s 42A report at paragraphs 230 through to 232. Policy 3.6 of the HWRRP requires water to be returned to the river in the same or better state and quality.
- 11.77 The discharge consent application received little attention during the course of the hearing because it does not raise any concerns about environmental effects or inconsistencies with relevant plans.
- 11.78 Ms Burbidge found after considering NTFE's assessment of environment effects of this activity that it was unlikely that between the diversion and discharge points any additional contaminants will enter the water. The only possible effect she identified related to sediment.
- 11.79 In relation to sediment, she noted that the settling pond allows sediment in the diverted water to settle out of the water column. The only risk she identified in relation to sediment was that if the flows through the settling pond were too high then sediment would not settle in the pond, but instead would be discharged into the Waiau River. She also noted that if flows were too high any sediment that settled in the fish return channel would also be remobilised and would flow through into the Waiau River.
- 11.80 NTFE satisfied Ms Burbidge that the flows through the settling pond would be such that they would not allow the re-suspension of sediment. She noted that this meets the purpose or objective of the settlement pond, and it is in NTFE's interest to ensure that re-suspension of sediment does not occur as this would impact upon the irrigation races themselves.
- 11.81 We agreed with her approach to sediment and we also agreed with her finding that the discharge of water diverted to operate the fish screen will be the same or better quality compared to the water diverted. As we have noted earlier, one cumec of water is to be diverted into the settling pond and then will discharge back to the Waiau River via the fish return channel.
- 11.82 Because of this configuration, it is extremely unlikely the water quality of the Waiau River water will be in any way affected. We agree with NTFE's assessment relating to water quality, namely there will be negligible changes in the quality of water diverted and we agree as well that the proposed settling pond velocities will not re-suspend sediment.
- 11.83 We also considered as required by s 105 RMA the nature of the discharge and the sensitivity of the receiving environment to adverse effects, along with NTFE's reasons for the proposed choice and alternatives available to it. Given that the diversion is already in place and being utilised, in our view none of these s 105 matters give rise to concern.
- 11.84 In similar fashion and for the same reasons, none of the circumstances listed in s 107 subsections (c) to (g) give us any concern in relation to the discharge of the fish bypass

water.

Conclusion on effect on instream values in the Waiau River of the take and discharge

- 11.85 We conclude that, given the compliance of the NTFE proposal with the environmental flow and allocation regime, and for the reasons stated above, the effects on instream values within the Waiau River will be minor, and the NTFE proposal will achieve Objectives 2 and 3 and Policy 3.6.
- 11.86 For the discharge application, given the findings in terms of effects we are satisfied that no issues arise in terms of s 105 and 107 of the RMA.

Other plans – s 104(1)(b) RMA

- 11.87 Mr Cowie identified for us that the CRPS (which became operative on 15 January 2013) is relevant for the Waiau take and associated activities. He pointed out the CRPS states that in regard to water the visions and objectives of the Canterbury Water Management Strategy are embodied into Chapter 7 of the CRPS.
- 11.88 We note also that Ms Burbidge at paragraph 243 of her principal s 42A report set out for us the relevant RPS objectives and policies for the taking of water from the Waiau River. She provided for us detail on Objectives 7.2.1, 7.2.2, 7.2.4, and 7.3.4.
- 11.89 Mr Cowie expressed the view with supporting reasons that these matters are embodied into the HWRRP. An example he gave was the environmental flow and allocation regime in the HWRRP for the Waiau River, namely Objective 2 and its associated policies. He contended, and we agree with him, that the HWRRP meets Objective 7.2.1 and Policy 7.3.4, and that Objective 7.2.2 is provided for in Objective 3 of the HWRRP.
- 11.90 So, our finding that the take and discharge consent will achieve the relevant objectives and policies of the HWRRP results in a similar finding that the take and discharge applications will also achieve the relevant objectives of the CRPS.
- 11.91 For much the same reasons, we record that NPS Objectives B1, B2, B3, B4 and Policies B1 through to B5 will also be achieved by the proposal.
- 11.92 We also agree that the NTFE take would be consistent with the CWMS and the relevant iwi management plans.

12 ANNUAL VOLUME AND EFFICIENCY OF TAKE AND USE

Policy context

- 12.1 Efficient use of allocated water is covered by Objective 8 and Policy 8.1, which require at least an 80% irrigation application efficiency to be achieved, together with an annual volume which provides for reasonable use of water 9 years out of every 10. In addition, leakage losses are to be minimised. Resource consents to take water must be for a specified use, and the rate and volume of abstraction must be reasonable for that use, in accordance with Policy WQN16 of the NRRP (included as Schedule 4 of the HWRRP). Policy 8.1(d) also requires takes exceeding 5 L/s to have water usage data telemetered to CRC.
- 12.2 Policy 6.5(a) requires proposals to take water to demonstrate how they will allow for a larger area of land to be irrigated. This is reflected in the Infrastructure Development Plan requirements included within Part 5 of the HWRRP. Policy 6.5(d) seeks to maximise the economic and social benefits of water abstraction, including utilising water for multiple out of stream uses.

NTFE's water take proposal

- 12.3 A take of up to 4.2 m³/s is sought. Up to 366 L/s is to be made available for land owners adjoining the canal to use. Users of this water would require their own separate consents to use water and to change the use of land, if necessary. NTFE has proposed a condition

that if this water is not taken up by other landowners within 5 years, the balance will be surrendered. We note here that we accept this approach. The proposal is in accordance with Policy 6.5(a) and we have no concerns about water being allocated and remaining unused, due to the condition requiring surrender.

- 12.4 The remaining 3,834 L/s is intended to irrigate 5,035 ha within a total irrigation area of 7,000 ha. The balance of the land would most likely be irrigated using water from the Hurunui River through a separate consent. NTFE is however seeking consent to 'use water' over the entire 7,000 ha.
- 12.5 The water will be taken progressively over a 15 year period. Mr Jansen provided a table showing the proposed rate of take as the area irrigated increases. Water storage will be required as the project is developed, due to the relatively poor reliability of B permit water. Up to 8 million cubic metres of on-farm water storage will be required, to achieve a reliability of 96%. Consents to authorise the storage will be sought at a later date. Water will be transferred via AICL's existing canal to the boundary of Balmoral, and then via a new 1.8 km canal into Balmoral. Water will be pumped to storage ponds and piped across Balmoral to the individual farms. Work will be required to upgrade the canal to increase its capacity and this will be subject to a separate consent process.

Annual volume sought

- 12.6 An annual volume of 49 million cubic metres is sought to be used for irrigation, and a further 765,000 m³ for stockwater and dairy shed operations (these volumes were reduced during the hearing from the volumes originally applied for). We note that this water is for the development of all of Balmoral and may be taken from both the Waiau take (which is part of this consent process) and from an alternative source.
- 12.7 Policy 8.1 requires a minimum of 80% irrigation efficiency and an annual volume that provides a "*reasonable use*" of water for the intended land use for 9 years out of 10, in accordance with Policy WQN16 of the NRRP. Policy WQN16 requires consideration of on-site physical factors such as water-holding capacity, and climatic factors such as rainfall variability and potential evapotranspiration. To determine the volume of water that meets this reasonable use test, either the method included in Schedule WQN9 of the NRRP (contained with Schedule 4 of the HWRRP) or an alternative method that is verifiable and can be calibrated to Balmoral, can be used.
- 12.8 In order to determine than appropriate annual volume, Mr Brough developed an irrigation supply and demand model in MATLAB. This calculates the daily supply of, and demand for, water, based on soil type, rainfall and evapotranspiration data, flow data for the Waiau, the allocation regime and available storage. A similar model was used to predict water demand for the HWP. Both supply and demand are incorporated into the same model. Mr Brough considered this was critical so that the storage volume could be sized appropriately to deliver the desired reliability of supply.
- 12.9 The annual volume sought was reviewed by Mr Neal Borrie acting as a s 42A officer for ECan. Mr Borrie used an alternative model, Irricalc, to determine an annual volume. This model is accepted by ECan as an alternative methodology to Schedule WQN9 and is commonly used by applicants to determine annual volumes for water takes. This model considers demand only and does not consider restrictions on supply.
- 12.10 In both cases, various assumptions were made on matters such as leakage loss from the canal, the soil moisture trigger at which irrigation would begin, and the daily application rate, which differed between the two experts. Following caucusing, agreement was reached on some parameters, but not on others. The models were re-run and the difference in annual volume was narrowed, to 49 million m³ for Mr Brough and 46.7 million m³ for Mr Borrie, for the 90th percentile demand (i.e. 9 years out of 10) for 7,000 ha of irrigation. Mr Borrie noted that the difference between these figures (4.9%) was within the level of accuracy of the rainfall estimates used.
- 12.11 Annual volumes for the 5,035 ha to be supplied by the take from the Waiau River were also provided, by directly scaling back the figures provided above.

- 12.12 One of the concerns raised by Mr Brough in relation to the calculation of the annual volume was that the river could not always supply the demand due to low flow restrictions. Consequently, in some years more water is taken from the Waiau River than the annual demand and stored until the following year. NTFE therefore sought a higher annual allocation to allow for this storage. Mr Borrie's view was that the HWRRP was quite clear that an annual volume equivalent to the demand in 9 years out of 10 was all that could be supplied to the land. A solution to this discussed at the hearing was to set two annual volumes - one at the point of take, which would allow for water storage, and one at the farm gate.
- 12.13 Given the similarity in demand figures between the two models following the re-modelling, NTFE considered there was no need to differentiate the annual volumes in this way. We agree with this, however we accept Mr Borrie's volume of 46.7 Mm³ as it is calculated in accordance with the HWRRP requirements of the amount that can be applied to the land.
- 12.14 However, because of our earlier finding relating to the change of land use application we will nevertheless need to scale back the annual volume so it is appropriate in terms of the reduced development option we prefer.

Annual volume and rate of take in relation to the reduced development option

- 12.15 As discussed earlier, the discharge of nitrogen from Balmoral means that the land cannot be fully developed and stay within the N load limits in the HWRRP. We have set a load limit for N of 57.2 tonnes/yr. This would allow for a limited amount of irrigation. To determine how much irrigation might be possible, we have considered the average N loss for different irrigated land uses provided to us in closing submissions. These were:

N loss – Dairy – 39.5 kg/ha/yr

N loss – Support – 33.3 kg/ha/yr

- 12.16 Picking the lowest discharge rate, for dairy support at 33.3 kg/ha/yr, up to approximately 1,500 ha of irrigated dairy support could occur, provided the remainder of the land was in forestry or natives (1.1 kg N/ha/yr), in order to remain within the 57.2 tonnes limit.

1500 ha x 33.3 = 49.9 tonnes

7096 ha x 1.1 = 7.8 tonnes

Total = 57.7 tonnes N/yr

- 12.17 In practice, we suspect that if irrigation was to occur it would be over a smaller area, with another portion of the farm in dryland farming, and the remainder in forestry or natives. However, it is not up to us to decide what use NTFE put the land to, provided the nutrient limits are met.
- 12.18 We find ourselves therefore in an unusual position. We have restricted the application on the basis of its nutrient discharge, and consequently we do not know what use the land will be put to, or how much water would be required for the chosen use. However, rather than decline the application on this basis, we have attempted to estimate water use, based on the maximum possible irrigation development. We accept that this approach is not the usual one, nor is it consistent with Policy 8.1(e). However, we prefer to allow the applicant the flexibility to choose an appropriate land use within the constraints of the nutrient load limit and so have estimated a volume and rate of take on the basis of a proportion of the development originally sought.
- 12.19 We assume therefore, that the maximum area of irrigation calculated above (1,500 ha) may be undertaken. Scaling back the annual volume for this area gives 10 Mm³ per year (1500/7000³⁹ x 46.7 Mm³ = 10 Mm³).

³⁹ The annual volume of 46.7 Mm³ is based on an irrigable area of 7,000 ha.

- 12.20 Scaling back the rate of take, we get: $1500/5035^{40} \times (4.2 - 0.366^{41}) + 0.366 \text{ m}^3/\text{s} = 1.5 \text{ m}^3/\text{s}$
- 12.21 In terms of the appropriateness of this rate, we note that the table provided by Mr Jansen that compares the area of the property irrigated to the rate of take required, shows that irrigation of 2,060 ha in 2014 will require a rate of take from the Waiau River of 1,569 L/s. We are confident therefore, that a rate of 1,500 L/s will be ample to provide water for the irrigation of the 1,500 ha we consider is the maximum potential area for irrigation under the reduced proposal.
- 12.22 We consider it appropriate that NTFE advise ECan prior to exercising the consent what land use will be undertaken in order to achieve the N discharge limit. This will include the amount of land to be irrigated, if any, and the rate and annual volumes required for irrigation, stockwater and dairy shed washdown. In order to ensure that water is not allocated to NTFE but then remain unused, we have attached a condition such that if less water is required than has been provided for in this consent, the remainder is surrendered.

Is the distribution of water efficient and water losses reasonable?

- 12.23 Policy 8.1(a) requires the minimisation of leakage in the design and operation of infrastructure used to convey water. The policy does not indicate what an appropriate maximum leakage rate is.
- 12.24 NTFE will use the existing AICL canal for the majority of the water transfer, and construct a new 1.8 km section at the Balmoral end. The likely leakage rate, and the appropriate rate that should be allowed for in the calculation of an annual volume, was raised at the hearing. After caucusing, both Mr Brough and Mr Borrie agreed that 10% off-farm race losses and 5% storage losses from the storage ponds were appropriate. Mr Borrie noted that the Waiau Irrigation Scheme race losses were measured at 7%, and the Waimakariri Irrigation Scheme (WIL) allows for 10% distribution loss.
- 12.25 Mr Brough noted that losses depend on the flow in the canal. For example, on the WIL scheme, when only stockwater is supplied and flows are low, the losses are proportionally greater, at 25% of the flow. When the race is carrying the full flow, the losses are 10%. Once the canal upgrade is complete, the losses can be measured and adjusted if necessary.
- 12.26 Since in this case the water taken will be transferred with AICL water, we agree with Mr Brough and Mr Borrie that losses in the order of 10% are likely, and that such losses are acceptable. Losses of 10% were assumed when both Mr Brough and Mr Borrie calculated the annual volume discussed above.

Stockwater and dairy shed washdown

- 12.27 Objective 1, and in particular Policy 1.3, enables up to 200 L/sec of additional water abstracted from the mainstem of the Waiau River for new stock drinking water supplies. Policy 1.5 allows this water to be taken without being subject to the minimum flow regime, where the supply has a Water Supply Asset Management Strategy in place.
- 12.28 NTFE's proposed conditions do not distinguish between water taken for irrigation and water taken for stockwater use, and the entire take is proposed to be subject to the minimum flow regime.
- 12.29 No Water Supply Asset Management Strategy was provided with the application. In future it would be possible for NTFE to develop such a strategy and apply to change the conditions of consent in relation to minimum flow restrictions. In the meantime however, we will proceed on the basis that the whole take is subject to the minimum flow regime.
- 12.30 NTFE have applied for stockwater and dairy shed washdown water using the volumes

⁴⁰ The rate of take applied for was to supply 5,035 ha

⁴¹ 366 l/s is for landowners adjoining the property, and does not need to be scaled back.

detailed in Schedule WQN11 of the NRRP. The total annual volume sought is 765,000 m³.

- 12.31 Without knowing how much stock (and of what type) will ultimately be on the land given the restrictions on nutrient discharge for the reduced proposal, it is impossible to determine how much washdown water and stockwater might be required. Using a similar scaling back as carried out above would allow a volume of approximately 164,000 m³.

$$765,000 \times 1500/7000 = 163,900 \text{ m}^3$$

- 12.32 We suspect there will be a limited requirement for dairy washdown, but there may be a requirement for stockwater over a greater proportion of Balmoral. However, since we have no other way of determining an appropriate volume, we have provided for a volume of 164,000 m³. We have attached a condition requiring that NTFE advise ECan of the proposed development and water volume required prior to exercising the consent. Any surplus allocation must be surrendered. We note for reference that we would have no concerns about a greater volume being granted, provided the number and type of stock justified it.

Water metering

- 12.33 Policy 8.1(d) requires takes in excess of 5 L/s to be metered and recorded data to be telemetered to an approved third party. NTFE has proposed metering conditions that meet the requirements of this policy.

Conclusion on annual volume and efficiency of take and use

- 12.34 Our discussion above relating to annual volume and efficiency of take and use confirms we are satisfied that the amended annual volume and the efficiency of the take and use is in accord with the relevant objectives and policies of the HWRRP. That being the case, we are also satisfied that effects arising from this activity are acceptable.

13 SECTION 104D JURISDICTIONAL HURDLES

- 13.1 The preceding sections of this decision set out our key findings in respect of the principal issues in contention. However, before we can proceed any further we must consider whether the preferred NTFE highly developed proposal as a non-complying activity is able to meet one of the threshold tests specified in s 104D of the RMA.
- 13.2 In considering the statutory test we have considered the preferred NTFE highly developed proposal subject to the proposed conditions. After considering the preferred NTFE highly developed proposal we will then move on and consider the reduced development NTFE proposal in terms of s 104D RMA.

First gateway test: adverse effects

- 13.3 The first gateway test requires us to consider the effects of the preferred NTFE highly developed proposal on the environment. To pass this gateway, we must be satisfied that the effects of the preferred NTFE highly developed proposal on the environment will be minor.
- 13.4 We acknowledge there have been a number of conflicting decisions of the Environment Court as to whether decision-makers should consider the positive effects of a proposal when deciding whether the threshold tests have been met. We are adopting the approach set out in *Stokes v Christchurch City Council*⁴² where the Court said:

"The Court of Appeal's decision in Bayley must cast doubts on transferring the Elderslie Park approach to Section 105(2A) (now Section 104D) as this division of the Court did in Baker Boys. Especially since we have to consider the adverse effects we consider that while it is still appropriate to consider each adverse effect as mitigated there is no statutory authority for us to consider the positive effects of

⁴² 1999 NZRMA 409, at page 434.

a proposal when considering the threshold tests in Section 105(2A)(a) is met. To that extent we consider that in the light of Bayley we were wrong in Baker Boys in adopting a (qualified) net adverse effects approach to the first threshold test. The test is whether the adverse effect as proposed to be remedied and/or mitigated and taken as a whole are minor."

- 13.5 Thus we propose to consider the effects of the preferred NTFE highly developed proposal as mitigated by the conditions of consent, but not the positive effects of this proposal.
- 13.6 In relation to the preferred NTFE highly developed proposal as it relates to the water take from, and discharge to, the Waiau River we conclude that the effects of allowing that activity would be acceptable because the environmental bottom lines in relation to environmental flows, allocation of water, efficient water use, and water use efficiency are met.
- 13.7 Notwithstanding the above, from our discussion of, and findings on, water quality in the Hurunui River relating to change of land use consent, the adverse effects as we describe them earlier within this decision, it will be obvious that some of the adverse effects of the preferred NTFE highly developed proposal on the environment are more than minor. These include:
- (a) the breach of the N load limit at SH1;
 - (b) an increase in discharge of N from Balmoral between SH7 and Dry Stream. This is likely to stimulate *Phormidium* growth as it responds to high nitrate concentrations, and may result in an increase in filamentous algae growth;
 - (c) the existing values, natural biota, and mauri of the mainstem of the Hurunui River will not be protected;
 - (d) periphyton growth will not be controlled, which will adversely affect the cultural, recreational, and amenity values of the Hurunui River mainstem; and
- 13.8 We have found that these effects are significant and that they cannot be avoided, remedied, or mitigated by conditions. Accordingly, the preferred NTFE highly developed proposal does not pass the first gateway test.

Second gateway test: objectives and policies of the HWRRP

- 13.9 We now move to consider the preferred NTFE highly developed proposal and the effects on the environment against the objectives and policies of the relevant plan, namely the HWRRP. We must be satisfied that the activity will not be contrary to the objectives and policies of the HWRRP.
- 13.10 Earlier and throughout this decision we have endeavoured to link and relate our findings to the relevant objectives and policies of the HWRRP. The HWRRP comprehensively deals with the taking, using, damming, and diverting of surface water; the discharge of water for non-consumptive activities; and the use of land in nutrient management areas as defined in that plan, particularly where that use may result in the discharge of nitrogen or phosphorus to water.
- 13.11 Considering the take from the Waiau River under the HWRRP, Section 2.2 deals with sustainably managing water levels and flows, relevantly, in the Waiau River in such a way so as to avoid significant adverse effects and avoid, remedy, or mitigate other adverse effects of abstraction. Objective 2 lists a number of ecological issues.⁴³

⁴³ Provision for upstream and downstream passage of native fish, trout, and salmon; avoiding, remedying, or mitigating adverse effects of take activities on landscape and amenity values; making provision for breeding and riverbed nesting birds; and ensuring that takes from rivers do not adversely affect the river mouth opening of the Hurunui River leading to periphyton and cyanobacteria accumulations impacting on recreational values and activities; and seeks to provide for existing recreational values, including salmon and trout fishing, kayaking, jet-boating, and swimming.

- 13.12 The policies taken as a group seek to support the outcomes provided for in the objectives. They do so in a more specific way by providing for more particularity around flows and the timing of flows to deal with issues such as periphyton and cyanobacteria accumulations, and also so provide for life-cycle processes for matters such as fish migration, and providing for recreational values and activities.
- 13.13 Part 2.3 HWRRP provides for allocation of water so as to enable further economic development. This outcome is provided while a range of environmental bottom lines, including provision for recreational users, are met and satisfied.
- 13.14 We are satisfied that the preferred NTFE highly developed proposal would meet the HWRRP's provisions as we have detailed them, to allow for water to be taken from the Waiau River and the discharge to occur. The key reasons for this is because the environmental bottom lines in relation to environmental flows and allocation of water, efficient water use, and water use efficiency as contained within the objectives and policies of the HWRRP are met. The same conclusion can be reached in respect of the higher order plans as they relate to the water take.
- 13.15 Turning to the change in land use, the HWRRP also comprehensively deals with the cumulative effects of land use on water quality, seeking to ensure that concentrations of nutrients are managed - again, so as to avoid adverse environmental outcomes and adverse impacts on amenity values and recreational and cultural values associated with water quality. The policy base sets stringent outcomes in terms of dissolved reactive phosphorus concentrations in the mainstem of the Hurunui River, as well as N loads.
- 13.16 We are not satisfied that the HWRRP objectives and policies as they relate to cumulative effects of land use on water quality will be met. Given our finding on the effects of the NTFE preferred fully developed option and the linkage between those effects and the objectives and policies, it is our finding that to grant consent to the NTFE preferred fully developed proposal would be contrary to Objectives 5.1, 5.2 and Policies 5.1 through to 5.3B of the HWRRP.
- 13.17 We consider that these objectives and policies are a fundamental part of the HWRRP and cannot be ignored. In particular, Policy 5.3B clearly states that a change to land use will only be allowed where it will not result in a breach of the water quality limits set in Policies 5.3, 5.3A and Schedule 1. This is a pivotal and directive policy that NTFE's highly developed proposal fails to comply with.
- 13.18 For the above reasons, we consider that preferred NTFE fully developed proposal is contrary to the objectives and policies of the HWRRP when read as a whole, and that the second gateway test has not been met.

Section 104D conclusions on the preferred NTFE highly developed proposal

- 13.19 Based on the above, the preferred NTFE highly developed proposal fails to pass either of the threshold tests specified in s104D. On this basis we have no discretion to grant consent and the highly developed proposal must be declined. For completeness, we note that even if we did have discretion to grant consent, we would not have done so for the reasons set out in this decision.

Reduced development proposal

- 13.20 Notwithstanding the above conclusion, for reasons already advanced, we consider that it is open to us to consider the grant of consent for a lesser developed proposal; that is, a change in land use that meets the N load limit in the plan. This is because the application before us provides for a range of development, from highly developed to lesser developed.
- 13.21 Earlier within this decision we have assessed that lesser proposal, particularly a proposal that has a reduced nitrogen load of 57.2 tonnes or 6.6 kg N/ha/yr across all of Balmoral. The reduced development proposal also includes a reduced or scaled back water take from the Waiau River, as explained earlier within the decision.

- 13.22 Utilising those findings as to the effects on the environment of this reduced proposal and our consideration of how consistent or otherwise this lesser proposal is with the relevant objectives and policies, primarily of the HWRRP and the higher order planning documents, we now assess this reduced proposal against s 104D RMA. Although the reduced proposal complies with the relevant load limits, it remains a non-complying activity due to breaches of other rules in the HWRRP, as discussed earlier in this decision.
- 13.23 As to the first gateway test, we conclude taking into account the conditions proposed and the key point that the nitrogen load is reduced, then in our view the effects of the reduced proposal on the environment for the reasons given within our decision are no more than minor. Thus the first gateway test is satisfied.
- 13.24 As to the second gateway test, namely consideration of the objectives and policies of the HWRRP, we find that after taking into account the conditions proposed and those that we will impose, that granting consent to this lesser proposal would mean that the relevant policies and objectives of the HWRRP will also be satisfied.
- 13.25 Having reached the conclusion that the reduced development proposal satisfies both gateway tests, we now advance to consider the reduced development proposal under Part 2 of the RMA.

14 PART 2 RMA

- 14.1 Given our conclusion that the highly developed proposal fails to meet either of the threshold tests in s104D, it is unnecessary to consider that proposal further. The remaining sections of our decision relate solely to the reduced proposal that meets the N load limit specified in the HWRRP.
- 14.2 Section 104(1) RMA states that the matters which we have discussed above are subject to the purpose and principles in Part 2 RMA. We discuss below the principles of the RMA in Sections 6 to 8 and return to the overriding sustainable management purpose of the RMA (Section 5) in our overall evaluation of the NTFE proposal.
- 14.3 The following principles inform and guide our ultimate decision as to whether or not the NTFE proposal is an appropriate development and one that will promote the sustainable management of natural and physical resources. The exercise is not a mechanistic check-list or a simple score-sheet. Nor do we consider that certain matters somehow trump or override other sections. We must take all these matters into careful consideration.

Section 6 matters of national importance

- 14.4 Section 6 RMA identifies matters of national importance that we must “*recognise and provide for*” when making our decision. Section 6(a) RMA requires us to recognise and provide for the preservation of the natural character of the river and its margins from inappropriate use and development.
- 14.5 In our view, the natural character of the Hurunui River will be preserved because of the reduced development proposal coupled with the conditions we impose, the water quality limits and load limits provided for within the HWRRP will be met. In relation to the river margins of the Hurunui River, these are not intended to be utilised by NTFE when it develops Balmoral, and so they will in that way be protected.
- 14.6 In terms of the water take from the Waiau River, the natural character of that river, including its braids and its margins, will be preserved from inappropriate use and/or development primarily because the objectives and policies relating to environmental flow and allocation of water contained within the HWRRP will be met.
- 14.7 Section 6(b) RMA requires us to recognise and provide for the protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development. We consider that the reduced form of development is not an inappropriate development on Balmoral. We consider that the separation or buffers NTFE is providing between the farming activity, at the reduced development proposal, will provide sufficient protection even for the outstanding natural features such as the Hurunui River. We also consider that this reduced form of development is in keeping with the farming activities that occur within the immediate surrounds of Balmoral. In this way we conclude that this reduced form of development is not an inappropriate development.
- 14.8 Section 6(c) RMA requires us to provide for the protection of significant vegetation and significant habitats of indigenous fauna. In relation to the reduced take from the Waiau River, the significant habitat of indigenous fauna (relevantly, river birds) is provided for by the proposal, as we have accepted Dr Saunder’s opinion that the proposed take for the fully developed will have nil or negligible effects on these river birds on the Waiau River. We consider having regard to the reduced proposal that protection of native fish, salmon, and trout to traverse the Waiau River is protected.
- 14.9 In our view, the reduced proposal coupled with the conditions we have imposed will prevent concentrations of nutrients entering the mainstem of the Hurunui River protecting the mauri of that waterbody, the natural biota, including river birds, native fish, trout, and their associated food supplies and habitat.
- 14.10 Section 6(d) RMA requires the maintenance and enhancement of public access to and along the coastal marine area, lakes, and rivers. As we understood it, NTFE does not

propose to restrict public access along the edge of the Hurunui River and the status quo as to access will remain. We understand that access is limited by the nature of the terrain. In any event, we think that the outcome of s 6(d) RMA is advanced by NTFE because it is committed to improving public access to the Hurunui River upstream of SH7 along with associated riparian planting. This matter is addressed in conditions relating to the change of land use application.

- 14.11 In terms of the relationship of Māori and their culture under Section 6(e) RMA, we received a good deal of evidence about the relationship of Māori and their culture and the linkage with the NTFE proposal. Indeed, NTFE is in the unique circumstance of having its application shaped by members of Ngāti Kuri.
- 14.12 The evidence of Gina Solomon and that of Mr Jansen convinced us that Māori and their culture will be both protected and provided for by NTFE. We are also satisfied that this outcome will be achieved both because of the water quality conditions we have imposed and the limits we have imposed on annual volumes.
- 14.13 Finally, in relation to Sections 6(f) and (g) RMA, there is very little historic heritage present and we were not aware of any customary rights be exercised. In any event, any s 6 RMA issues arising, particularly in relation to customary rights, will we think be more than adequately dealt with because of the important and close relationship between Ngāti Kuri and NTFE.

Section 7 other matters

- 14.14 We now turn to the relevant matters that we are to have particular regard to under Section 7 RMA, including kaitiakitanga,⁴⁴ the efficient use of natural resources, the maintenance and enhancement of amenity values and the quality of the environment, the intrinsic value of ecosystems, and the protection of habitat for trout and salmon, among other matters.
- 14.15 As we understand it, kaitiakitanga in this context will involve ongoing involvement of tangata whenua with the natural and physical resource, which in this case is both the land and the Hurunui and Waiau Rivers. Kaitiaki,⁴⁵ again as we understand it, involves the opportunity to exercise guardianship of the natural and physical resources of the area in accordance with tikanga Māori.
- 14.16 In this instance because of the special relationship between Ngāti Kuri and NTFE and based on the evidence we received, we are well satisfied that kaitiakitanga will be provided for.
- 14.17 In terms of the efficient use of water, we consider that the reduced volume of the take in accord with the reduced proposal and regular monitoring has particular regard to this requirement.
- 14.18 In terms of the maintenance and enhancement of amenity values and the quality of the environment, we consider the reduced proposal coupled with the conditions we have imposed will ensure the maintenance and enhancement of the amenity values and the quality of the environment in and around Balmoral.
- 14.19 In relation to the intrinsic value of ecosystems, we think these matters are addressed, again, primarily by the water quality conditions we have imposed.
- 14.20 We have also protected the habitat of salmon and trout in the Waiau River through conditions we have imposed on the take, and in the Hurunui River due to the conditions we have imposed in terms of nutrient discharge.

Section 8 Treaty of Waitangi

- 14.21 Finally, Section 8 RMA requires that we shall take into account the principles of the Treaty

⁴⁴ Guardianship, stewardship, trustee (<http://www.maoridictionary.co.nz>).

⁴⁵ Trustee, minder, guard, custodian, guardian, keeper (<http://www.maoridictionary.co.nz>).

of Waitangi (Te Tiriti o Waitangi). Section 8 recognises the relationship of tangata whenua with natural and physical resources and encourages active participation of, and consultation with, tangata whenua in resource management decision-making.

- 14.22 Māori is considered to be a key stakeholder with interests in the NTFE proposal. Based on the evidence we heard, primarily from Mr Jansen and Ms Solomon, we are well satisfied that tangata whenua is actively involved with this application. Consultation and careful consideration of cultural values and how they are to be provided for within the context of this application were clearly evident to us. In this way we are satisfied that the principles of the Treaty of Waitangi have been taken into account.

15 OVERALL EVALUATION

- 15.1 If an application for a non-complying activity passes through either of the jurisdictional hurdles in s 104D RMA, then we have a discretion as to whether consent should be granted. This requires an overall judgment to achieve the purpose of the RMA and is arrived at by:
- (a) Taking into account all the relevant matters identified under s 104 RMA;
 - (b) Avoiding consideration of any irrelevant matters;
 - (c) Giving different weight to the matters identified under s 104 RMA — depending on our opinion as to how they are affected by the application of ss 5(2)(a), (b), and (c) RMA and ss 6-8 RMA— to the particular facts of the case, and then in light of the above;
 - (d) Allowing for comparison of conflicting considerations, the scale or degree of conflict, and their relative significance or proportion in the final outcome.

Effects on the environment

- 15.2 We have discussed at some length in this decision the actual and potential effects on the environment of allowing the preferred NTFE highly developed proposal and a lesser developed proposal. For reasons we have already advanced in relation to effects, we consider that the actual and potential effects of allowing the lesser or reduced developed proposal are acceptable.

Relevant provisions of the HWRRP and higher plans and national policy statements

- 15.3 We have earlier in this decision related our findings to the relevant objectives and policies of the HWRRP. The relevant objectives, policies, and rules of the HWRRP are part of the statutory framework against which our assessment and findings earlier in this decision were carried out. It is our finding the grant of consent for a reduced development proposal would be consistent with the HWRRP and the higher orders plans and national policy statement.

Exercise of discretion

- 15.4 In exercising our discretion we have had regard to all our findings that we have come to in accordance with the legal and statutory framework and directions. We consider that the effects of the reduced proposal, such as they are, can be appropriately avoided, remedied, or mitigated by the conditions we have imposed. Also, the reduced proposal is consistent with the relevant planning framework.
- 15.5 In consenting the reduced proposal we think that with the fabric of conditions that we have imposed, all of the subparagraphs of Section 5(a), (b), and (c) RMA will be adequately met and provided for.
- 15.6 Having reviewed the application documents, all the submissions, taking into account the evidence to the hearing, and taking into account all relevant provisions of the RMA and other relevant statutory instruments, we have concluded that the outcome which best

achieves the purpose of the RMA is to **partially** grant consent, as detailed within this decision and subject to conditions.

16 CONDITIONS AND MONITORING

Use of water and change in land use

Conditions

- 16.1 With the reduced form of development in mind, we have considered the conditions proposed by NTFE for the change of land use consent and suggestions made by the Reporting Officers. In general we accept NTFE's conditions, but have made changes. Following on from the discussion above relating to the reduced proposal, the most significant change we have made to the conditions is to reduce the annual N discharge load from the land. NTFE sought that the nutrient limit was applied as a rate discharged from the land, rather than as a load at SH1. We accept that this is appropriate.
- 16.2 We do not accept that conditions that allow the annual discharge rate to change are appropriate. This rate has been calculated as the allowable rate such that the HWRRP N load limit at SH1 will not be exceeded. Compliance with this rate is critical. If a future version of OVERSEER™ or an alternative model indicates that the average discharge rate from the chosen land use exceeds 6.6 kg/ha/yr, then the land use will have to be altered, or the amount of land involved reduced, to meet this limit. If a future version of OVERSEER™ indicates that the discharge from the chosen land use is less than 6.6 kg/ha/yr, then NTFE can take advantage of this to increase the area of land involved or to intensify it, provided the limit is maintained.
- 16.3 Since we do not know what land use will take place, and over what area, and wish to preserve flexibility for the applicant to choose the most appropriate use for the land, it is appropriate that prior to the exercise of the consent NTFE provide to ECan details of the proposed land use, to demonstrate how the limit will be achieved.
- 16.4 We support the concept of waypoints, which were extensively discussed during the hearing. These provide a point in the development process where effects are formally assessed, and a decision can be made as to whether development can continue or be scaled back if catchment load limits have been exceeded.
- 16.5 Given the reduced extent of development, we consider there is no need for the waypoints identified by NTFE in relation to development of Areas A and B. However, a waypoint review that co-incides with the HWP's review would be beneficial, to consider the combined effect of the two developments on catchment nutrient loads together. Should catchment loads be exceeded, it is appropriate that the discharge of nutrients is reduced, to the extent that NTFE has contributed to the exceedance.

Monitoring

- 16.6 Monitoring of a variety of groundwater quality parameters is proposed by NTFE. NTFE propose to initially monitor only the three wells currently drilled towards the eastern boundary of Balmoral. They are currently undertaking groundwater investigations and wish to delay drilling further monitoring wells until the results of that work is complete, in order to allow determination of the most appropriate location of those wells.
- 16.7 However in this regard, we agree Dr Scott, who considered this to be inadequate, and have required that three additional wells be installed, with monitoring of all wells to take place for a period of at least 12 months prior to the consent being exercised. This is particularly to understand the existing P concentration in the groundwater beneath Balmoral, so that any leaching of P to groundwater can be identified once development proceeds. Since compliance with the HWRRP Policy 5.3(c) is dependent upon no further discharge, we see it as critical that this takes place.
- 16.8 Despite the fact that the proposal has reduced from the full development option, the

reduced development proposal is still sizable and we believe justifies the monitoring we have required.

- 16.9 Discharge of N will be monitored through annual assessment of loss from the site using OVERSEER™ or an appropriate alternative model.

Take, divert and discharge of water

Effects on Waiau River

- 16.10 We have considered the conditions proposed by NTFE for the take, divert and discharge of water consents in relation to effects on the Waiau River, and generally agree with those conditions. We have also had regard to comments made by Ms Burbidge and incorporated changes where appropriate.
- 16.11 The main changes we have made, based on our discussion above, are as follows:
- (a) Requirement for a minimum water depth in the Waiau River between the point of take and the point of discharge from the fish bypass
 - (b) A requirement for the fish screen to be upgraded within 12 months
 - (c) Details of the standards to which the fish screen must be upgraded.
- 16.12 We have amended the graphs that show the reduction that is required for the diversion past the fish screen as flows in the Waiau River fall. The graphs proposed by NTFE combined the diversion with the take of water, which we found confusing. The graphs now detail only the reduction in the diversion that is required, with the graphs attached to the take consent detailing the reduction in take.
- 16.13 Given our findings that the effect on instream values is minor, no particular monitoring is required in relation to these effects.

Annual volume and rate of take

- 16.14 Some of the conditions proposed on annual volumes and rates of take have been discussed earlier in this decision. Primarily, we have reduced the rate of take and annual volume from that sought to correspond with the reduced proposal. We have required NTFE to provide ECan with details of the rate and volume of water that will be taken, prior to exercise of the consent. If the full rate or volume is not required for the proposed development, NTFE will be obliged to surrender the additional allocation, so that others may use it.

17 LAPSING AND DURATION OF CONSENTS

Duration

- 17.1 NTFE has requested a consent duration until 25 March 2033 for the applications for the water divert, take, and discharge. This is because that expiry date aligns with the expiry date on the relevant AICL Waiau consents. We accept this is an appropriate approach.
- 17.2 There is no specific request for a duration on the land use consent. However, we think it sensible that the same duration, namely until 25 March 2033 apply. This will keep all of the consents bundled together.
- 17.3 A lapse date for the take of water for the use of landowners adjoining the canal has been proposed by NTFE, for the purpose of preventing the tying-up of that resource if it is unused. That lapse date is five years. It is included in conditions and we agree with it.

Lapsing of consents

- 17.4 NTFE proposed a five year period for the lapsing of consents. We have adopted that period within the consent conditions.

18 DECISION

- 18.1 Pursuant to the powers delegated to us by the Canterbury Regional Council; and
- 18.2 For all of the above reasons and pursuant to sections 104, 104B, 104D, 105, and 107 of the Resource Management Act 1991, we **PARTIALLY GRANT** consent to **Ngāi Tahu Farming Limited** for the following applications in **amended form as described and contained within the conditions** :
- a) **CRC132458 –partial grant** to take and divert water;
 - b) **CRC147370** - to divert water (fish bypass);
 - c) **CRC147369 – partial grant** to use water for irrigation;
 - d) **CRC142438** - to discharge water to water; and
 - e) **CRC144606 - partial grant** to change the use of land which may result in the discharge of nitrogen or phosphorus
- 18.3 Pursuant to Section 108 RMA, the grant of consent is subject to the conditions specified at **Appendices 3 to 7**, which conditions form part of this decision and consent.
- 18.4 The duration of all consents shall be until 25 March 2033.

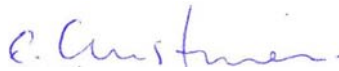
DECISION DATED AT CHRISTCHURCH THIS 18TH DAY OF JULY 2014

Signed by:

Paul Rogers



Emma Christmas



List of abbreviations and/or acronyms used in the decision

AICL	Amuri Irrigation Company Limited
CRC	Canterbury Regional Council
DRP	dissolved reactive phosphorus
HWP	Hurunui Water Project
HWRRP	Hurunui and Waiau River Regional Plan
NDS	nutrient diffusing substrate
NPS	National Policy Standard Freshwater Management 2011
NES Drinking Water	The Resource Management (National Environmental Standards for Sources of Human Drinking Water) Regulations 2007
NRRP	Natural Resources Regional Plan
NT Farming	Ngāi Tahu Farming Limited
NTFE	Ngāi Tahu Farm Estates Limited (the applicant)
NTPL	Ngāi Tahu Property Limited
RMA	Resource Management Act 1991
RPS	Canterbury Regional Policy Statement
WCC	Weighted Composite Cover

List of Submitters who appeared at the hearing

Week 1 - Monday 5th May – Friday 9 May 2014

Monday 5 May 2014

Applicant - Legal Submissions – Jo Appleyard

Applicant - Edwin Jansen

Applicant - Nathan Fletcher

Applicant - Dr Mark Sanders

Tuesday 6 May 2014

Applicant - Andrew Brough

Applicant - Peter Callander

Applicant - Gina Solomon

Applicant - Dr. Cathy Kilroy

Wednesday 7 May 2014

Applicant - Dr. Cathy Kilroy - continued

Submitter – Robin Gray

Submitter – Louise Thompson

Submitter – Linda Laing

Submitter – Ainslie Talbot

Submitter – John Talbot

Applicant - Peter Callander – supplementary report

Applicant – Brent Cowie

Thursday 8 May 2014

Applicant – Brent Cowie - continued

Submitter – Rosalie Snoyink

Submitter – Julian Garrett

Submitter – Hans van der Wal – legal submission for M, L & G Rutherford

Submitter – Edward Snowdon

Friday 9 May 2014

Commissioners Site Visit

WEEK 2 Monday 19th May – Thursday 22nd May 2014

Monday 19 May 2014

Submitter – Scott Pearson for Fish & Game- North Canterbury

Submitter – Canterbury District Health Board –Community & Public Health

- Alistair Humphrey
- Elaine Moriarty
- Dr Lee Burberry

Submitter – Nick Ledgard

Submitter – Ashton Eaves

Submitter – Doug Rankin for Whitewater New Zealand

Tuesday 20 May 2014

Submitter – Doug Rankin for Whitewater New Zealand – continued

Submitter – Hurunui Water Project – Legal Submissions – Ewan Chapman

Submitter – Diana Shand

Submitter – Jane Demeter

Submitter – Peter Anderson

Wednesday 21 May 2014

Submitter – Lesley Shand

Submitter – Amuri Irrigation Company – Legal submission – Kelvin Reid

- Peter Brown
- Andrew Barton

Reporting Officer – Neal Borrie

- Ian Brown
- Marta Scott

Thursday 22 May 2014

Submitter – supplementary report – Doug Rankin for Whitewater NZ

Reporting Officer – Adrian Meredith

- Adele Burbidge

Friday 30 May 2014

Applicants Reply

Submitters who advised they were not presenting

Chris Jackson

Johaam Ormandy

Joel Alyward

Michael Dawson

Paul Spark

Paddy O'Donoghue

Samuel Shield

Mark Fleming

Peter Kinney

NZ King Salmon Ltd

Upper Waiau Irrigators

Dry Creek Dairy Ltd

Department of Conservation – letter tabled.

A & M Hamblett

Hurunui River Independent Irrigators

APPENDIX 3

Consent conditions for CRC132458 to divert up to 1,500 litres per second of water from the mainstem of the Waiau River, at or adjacent to the Leslie Hills Road Bridge intake operated by Amuri Irrigation Company Limited and take up to 1,500 litres per second of water from Waiau Irrigation Scheme settling pond operated by Amuri Irrigation Company Limited.

Definitions

HWRRP *means* the operative Hurunui and Waiau River Regional Plan dated 20 December 2013

Divert

- 1 The diversion of up to 1,500 litres per second of water may only be taken from the Waiau River at or adjacent to the Leslie Hills Road Bridge (Topo50 BU24:8369-7358) either through the existing intake operated by Amuri Irrigation Company Limited or through an enlarged intake constructed by the consent holder and under the control of Amuri Irrigation Company Limited.

Take

- 2 No water shall be taken under this consent unless the use of water is also authorised by a resource consent.
- 3 Up to 1,134 L/s of water authorised to be taken by this consent may be used for irrigation on the Land shown on the plan marked and attached as **PLAN NTFE 1 - LAND** and forming part of this consent. However, irrigation will not occur on the Restricted Areas identified within Plan NTFE 1 – LAND.
- 4 Up to 366 L/s of water authorised to be taken by this consent may be used for irrigation (including storage) by other users along and adjacent to the 190 m RL Waiau transfer canal.
- 5 At least six months prior to the exercise of this consent, the consent holder shall provide to Canterbury Regional Council (Attn: RMA Compliance and Enforcement Manager) details of the maximum rate at which water will be taken under this consent to undertake the development authorised under consent CRC144606.
- 6 Where the maximum rate at which water will be taken as advised under Condition 5 is less than 1,134 litres per second, the consent holder shall surrender that portion of the water permit that will not be taken.
- 7 Water may be taken from the Waiau Irrigation Scheme settling pond (Topo50 BU24:8448-7260) either through the existing fish screen and control gate operated by Amuri Irrigation Company Limited or through an upgraded fish screen and control gate constructed by the consent holder and under the control of Amuri Irrigation Company Limited.
- 8 The maximum rate at which water is taken shall not exceed 1,500 litres per second provided that the consent holder may not either take more than 1,000 litres per second, or take water under this consent for 12 months, whichever occurs earlier, without first ensuring the fish screen and fish return is compliant

with performance standards contained in the HWRRP as WQN12: Fish screen standards and guidelines), which is attached and marked **Attachment 1**.

- 9 For the avoidance of doubt, this consent constitutes a B permit allocation of 1,500 litres per second from the Waiau River mainstem in accordance with the Environmental Flow and Allocation Regime contained in the HWRRP.
- 10 The consent holder may take:
- (a) A permit water authorised to be taken by the Amuri Irrigation Company Limited at the Leslie Hills intake provided that:
 - (i) the consent holder obtains the prior written approval of Amuri Irrigation Company Limited before the first divert and take of A permit water under this consent; and
 - (ii) the consent holder can demonstrate to the satisfaction of the Canterbury Regional Council, Attention: RMA Monitoring and Compliance Manager that the Amuri Irrigation Company A permit consent take is not being fully exercised on that day and that the total of the A permit water taken by the consent holder and the Amuri Irrigation Company Limited does not exceed 11,000 litres per second; and
 - (b) B permit water.
- 11 Restrictions on taking B permit water:
- (a) Whenever the:
 - (i) mean flow in the Waiau River for the 24 hour period ending at noon on any one day falls below 37.83 cubic metres per second at the Marble Point recorder, the taking of water in terms of this consent shall cease;
 - (ii) mean flow in the Waiau River for the 24 hour period ending at noon on any one day falls below 48.83 cubic metres per second at the Marble Point recorder then the rate at which water is taken shall reduce to that shown on the graph CRC132458A attached and marked **Attachment 2**;
 - (iii) Canterbury Regional Council, in consultation with a Water User Committee representing water users who are subject to the same restrictions, has determined a water sharing regime that restricts the taking of water to that available to those consent holders who are members of the same Water User Committee above the minimum flow in clause (i) of this condition, then the taking of water in accordance with that determination shall be deemed to be in compliance with clause (ii) of this condition.
- 12 Restrictions on taking A permit water:
- (a) Whenever the:
 - (i) Mean flow in the Waiau River for the 24 hour period ending at noon on any one day falls below 20 cubic metres per second, the taking of water in terms of this consent shall cease.

- (ii) Mean flow in the Waiau River for the 24 hour period ending at noon on any one day falls below 37.83 cubic metres then the rate at which water is taken under this consent and CRC951305 shall not exceed the rate shown on the graph CRC132458B attached and marked **Attachment 3**;
 - (iii) Canterbury Regional Council, in consultation with a Water User Committee representing water users who are subject to the same restrictions, has determined a water sharing regime that restricts the taking of water to that available to those consent holders who are members of the same Water User Committee above the minimum flow in clause (i) of this condition, then the taking of water in accordance with that determination shall be deemed to be in compliance with clause (ii) of this condition.
- 13 The flow referred to in Conditions 11 and 12 shall be the flow estimated by the Canterbury Regional Council in the Waiau River at the Marble Point recorder site at Topo50 BU24:8146-7854.
 - 14 At all times the consent holder shall comply with the environmental flow and allocation regime specified in the HWRRP.
 - 15 If the take authorised by this consent exceeds 1,000 litres per second, the consent holder shall not take water for at least 24 hours if the flow in the Waiau River, as measured at Marble Point, exceeds 110 m³/s for more than 6 hours.
 - 16 The taking of water under this water permit shall cease when the instantaneous unmodified flow as estimated by Environment Canterbury at the Marble Point flow recording site in the Waiau River exceeds 210 m³/s.

Allocation to Users

- 17 If after five years of this consent being granted the allocation authorised by Condition 4 has not been fully taken up, the consent holder shall surrender that portion of the water permit of up to 366 L/s that has not been taken up by other users along the 190 m RL Waiau transfer canal.
- 18 At 10 yearly intervals after the commencement of this consent, the consent holder shall prepare and submit a Water Management Report to the Canterbury Regional Council.
- 19 The Water Management Report shall assess and provide justification for the continued allocation of water under this consent.
- 20 Upon receipt of the Water Management Report prepared in accordance with Condition 19, the Canterbury Regional Council may review the conditions of this consent to determine whether or not the justification is adequate and whether or not the maximum rate at which water may be taken under this consent should be reduced without compromising the purpose for which the consent was granted.

Intake and fish screen

- 21 The construction of an enlarged intake on the Waiau River at Leslie Hills Rd Bridge shall be undertaken in accordance with certified design plans approved by the Canterbury Regional Council through a civil works consenting process:

- (a) The construction of an upgraded fish screen and fish return in accordance with Condition 8 shall be undertaken in accordance with certified design plans approved by the Canterbury Regional Council.
- (b) The upgraded fish screen and fish return shall be designed and operated to exclude the fish communities of the Waiau River, having regard to the seven principles in the NIWA publication *Fish Screening: Good Practice Guidelines for Canterbury, October 2007*, and subject particularly to:
 - (i) the fish diversion barriers shall have a maximum cross-sectional approach velocity of no greater than 0.12 metres per second; and
 - (ii) the sweep velocity across the fish diversion barriers shall exceed the approach velocity; and
 - (iii) an effective bypass system shall be maintained to return fish to an active braid of the river.
- (c) The design plans shall be certified by:
 - (i) a suitably qualified and experienced engineer with experience in the design and operation of intake and fish screen structures (Certifier 1); and
 - (ii) a fisheries expert with experience in exclusion of both native and introduced fish species (Certifier 2);
- (d) The appointment of the Certifiers by the consent holder shall be subject to the prior approval of the Canterbury Regional Council;
- (e) Prior to commencement of construction of the upgrade fish screen, the consent holder shall provide to the Canterbury Regional Council, Attention: RMA Monitoring and Compliance Manager, certified design plans, including:
 - (i) the design plans and operating guidelines;
 - (ii) post construction testing and monitoring of the effectiveness of the fish barrier for the Waiau River fish community; and
 - (iii) a joint report from Certifier 1 and Certifier 2, which certifies the effective design and operation of the upgraded fish screen that demonstrates good practice in the achievement of Conditions.
- (f) The Canterbury Regional Council shall give written notice to the consent holder stating whether or not it approves of the certified design plans within 20 working days of receipt of the plans and such approach shall not be unreasonably withheld.
- (g) The consent holder shall, prior to the commissioning, provide a certificate from a suitably qualified and experienced person confirming that the construction of the fish screen and fish return has occurred in accordance with the certified design plans approved in accordance with Conditions.
- (h) The consent holder shall operate the upgraded fish screen and fish return in accordance with the certified plans, operating guidelines, and testing and monitoring programme approved in accordance with Conditions.

- 22 In the event that a fish diversion barrier is damaged or is not operating in accordance with the design plans and operating guidelines, the consent holder shall repair or reinstate the fish screen and fish return within 24 hours, or shall cease the taking of water. The take of water shall not recommence until such time as the fish screen and fish return complies in full with the certified design plans.

Metering of water take

- 23 Prior to the exercise of this consent, the consent holder and the Amuri Irrigation Company Limited shall agree to the satisfaction of the Canterbury Regional Council, Attention: RMA Monitoring and Compliance Manager a method for monitoring and reporting to the Canterbury Regional Council the individual rates of water taken under this consent and consent CRC951305 held by the Amuri Irrigation Company Limited.
- 24 Prior to water being taken under this consent, the consent holder shall install a water flow measuring device that has an International accreditation, New Zealand or equivalent calibration endorsement, to continuously measure the taking of water in terms of this consent to within an accuracy of plus or minus 10 percent.
- 25 The water meter and recording device(s) shall be installed and maintained throughout the duration of the consent in accordance with the manufacturer's instructions and all practicable measures shall be taken to ensure that the water meter and recording device(s) are fully functional at all times.
- 26 The rates and times of water abstraction shall be recorded by electronic means, at or greater than fifteen minute intervals, with a tamper-proof recording device such as a data-logger kept for that purpose and which is telemetered. The recorded data shall not be changed or deleted by any person. All data older than 12 months shall be archived in original format and provided to the Canterbury Regional Council upon request.
- 27 All data from the recording device described in Condition 26 shall be provided to the Canterbury Regional Council on request, and shall be accessible and available for downloading at all times by the Canterbury Regional Council.
- 28 Within six months of the commencement of this consent, and at five-yearly intervals thereafter, and at any one time when requested by Canterbury Regional Council, the consent holder shall provide a certificate to the Canterbury Regional Council signed by a suitably qualified and experienced person certifying the accuracy of the measuring and recording devices installed in accordance with Conditions 24 and 25, and also certifying that data can be readily accessed.

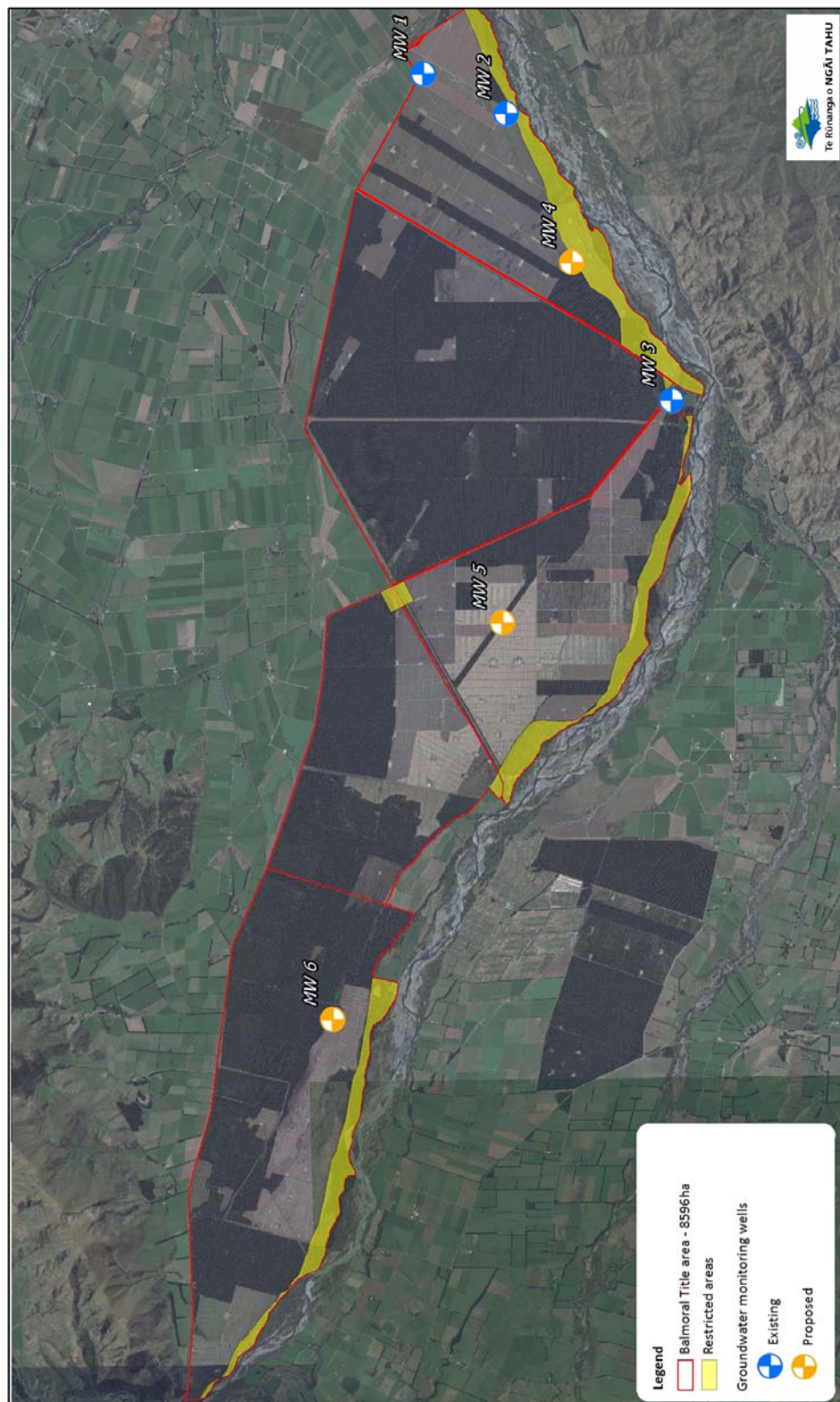
Compliance Report

- 29 The consent holder shall supply to the Canterbury Regional Council by 31 August each year:
- (a) A plan outlining the actual land holdings supplied with water for the prior year ending 30 June;
 - (b) The daily rate of water take and the total volume of water taken for the year ending 30 June; and
 - (c) Evidence of continuing compliance with the conditions of this consent.

Review and Term

- 30 The Canterbury Regional Council may, on any of the last five working days of May or November in any year, serve notice of its intention to review the conditions of this consent for the purpose of dealing with any adverse effect on the environment, which may arise from the exercise of the consent and which it is appropriate to deal with at a later stage.
- 31 The consent shall expire on 25 March 2033.
- 32 The lapsing date for the purposes of section 125 shall be 5 years.

PLAN NTFE 1 – LAND
 Irrigable Land (7,000 hectares within red perimeter) excluding Restricted Land (Yellow)



Schedule WQN12: Fish screen standards and guidelines

Fish screen standards and guidelines for rules WQN1 – WQN8²⁵

A. Where the diversion and take does not exceed a maximum rate of 10 L/s and a maximum volume of 100 m³/d a fish screen shall be installed to prevent fish from entering the intake. The fish screen shall be designed to the following standard and kept functional at all times that water is being taken:

- (a) water shall only be taken when a fish screen with a mesh size or slot width not exceeding []¹ millimetres is operated and maintained across the intake to ensure that fish and fish fry are prevented from passing through the intake;

¹Add in one of the following to the above condition:

- (i) 2 mm for intakes within 2 km of the coast, a coastal lake or estuary;
- (ii) 4 mm for anywhere else;

- (b) The screen area shall be designed to ensure the calculated average through screen velocity does not exceed 0.12 m/s.²

² The required area of fish screen (m²) = flow (L/s) / 120.

Example: The required fish screen area for a cylindrical screen can therefore be calculated from:

$$\text{Area} = 2\pi r(r + h) \times z$$

Where: $\pi = 3.14159$

r = radius of cylinder (m)

h = length or height of cylinder (m)

z = proportional open mesh area of screen material (i.e. 0.5 for mesh that is 50% open area)

Note: The above formula holds where the screen is fully immersed in water as is usually the case with pump takes. Where this is not the case, the area will need to be adjusted accordingly. Where 50% of the screen may be exposed, then the area calculation will need to be adjusted to half (or multiplied by 0.5), or the actual screen area would need to be doubled (multiplied by 2) in order to achieve the same area immersed. This example makes no allowance for the area taken up by the end of the intake pipe.

B. Where the diversion and take does not exceed a maximum rate of 10 L/s and a maximum volume of 100 m³/d but does not meet the standards in A above; or where the diversion and take exceeds a maximum rate of 10 L/s and a maximum volume of 100 m³/d and the diversion is less than 10 m³/s or the take is less than 500 L/s pumped, a fish screen shall be installed to prevent fish from entering the intake.

The fish screen shall be designed with the following features:

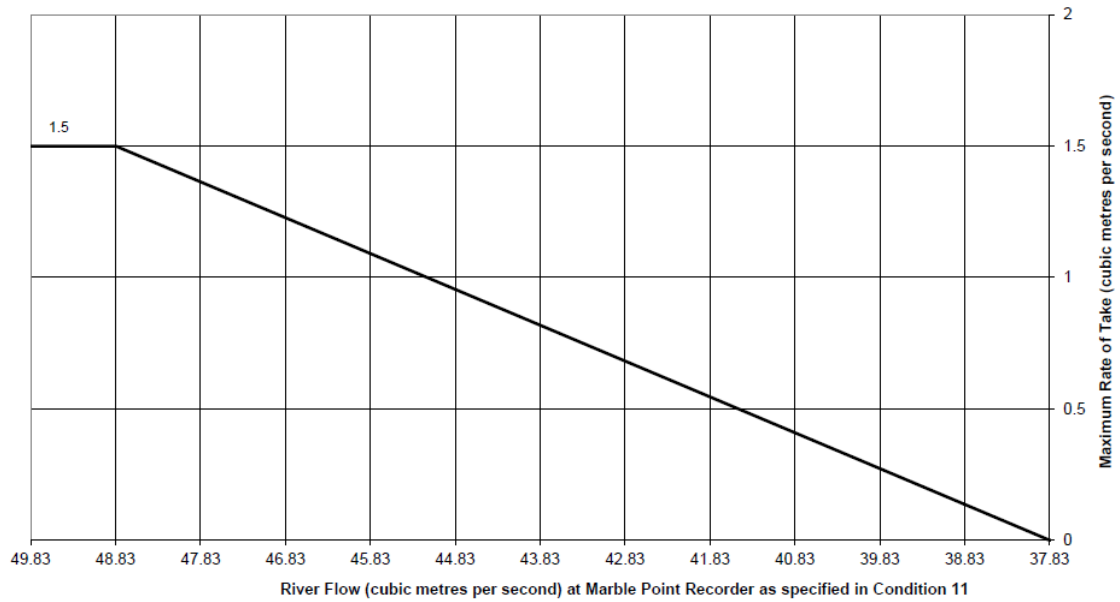
- (a) The site is located to minimise exposure of fish to the fish screen structure, and minimises the length of stream affected while providing the best possible conditions for (b) – (g) below;
 - (b) Water velocity (“speed”) through the screen (“approach velocity”) is slow enough to allow fish to escape entrainment (being sucked through or washed over the screen) or impingement (being squashed or rubbed against the screen);
 - (c) Water velocity across (or past) the screen (“sweep velocity”) is sufficient to sweep the fish past the intake promptly;
 - (d) A suitable fish bypass is provided so that fish are taken away from the intake and back into the source channel;
 - (e) There is “connectivity” between the fish bypass and somewhere safe, usually an actively flowing (i.e. not still) main stem of the waterway;
 - (f) Screening material (mesh, profile bars or other) on the screen needs to have openings small enough to exclude fish, and a surface smooth enough to prevent any damage to fish; and
 - (g) The intake structure and fish screen are operated to a consistent, appropriate standard with appropriate operation and maintenance, and this operation and maintenance should be checked or monitored. A record should be kept of all the maintenance and monitoring carried out.
- C. Where the diversion is more than 10 m³/s or the take is more than 500 L/s pumped, in addition to the features listed in B (a) to (g) above, it will be necessary for the intake to be purpose designed and to consider on a case by case basis whether any additional features will be necessary to ensure fish are prevented from entering the intake.

Note:

1. Submerged galleries, or behavioural barriers and devices such as those that use light and sound diversions may not meet all of the engineering features set out in B above, but shall be considered to comply with them where it is demonstrated that they are able to exclude fish to the same degree of effectiveness.
2. In conjunction with a number of stakeholder groups, Environment Canterbury has developed good practice guidelines for fish screening in Canterbury. A copy of this guideline can be obtained from Environment Canterbury to help in ensuring fish screens are designed, installed and operated to include the features identified in B above.

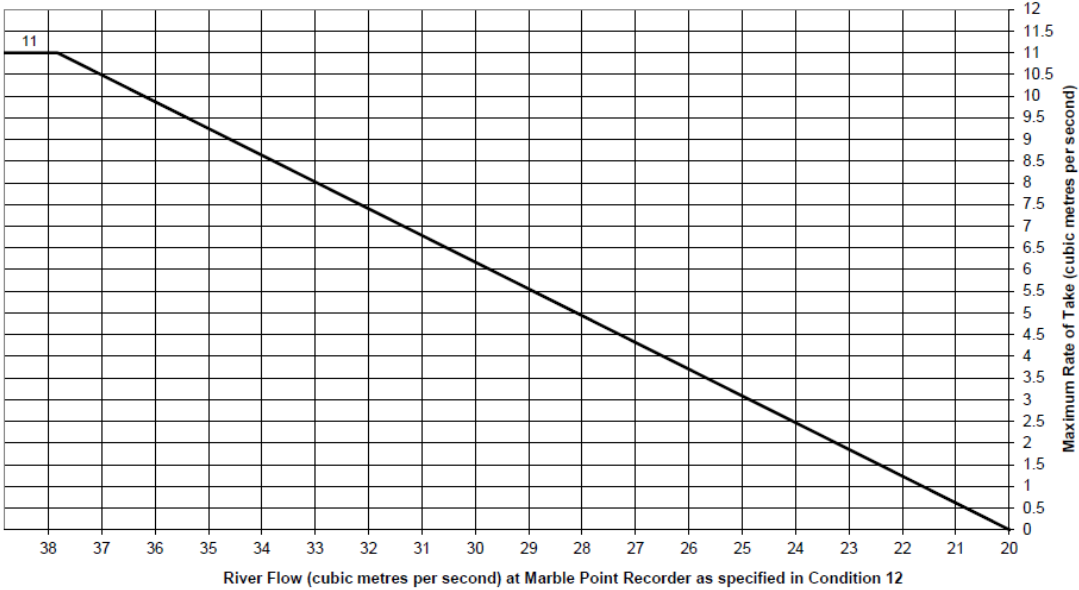
²⁵ These rules are not applicable to the HWRRP.

Graph CRC132458A Maximum allowable abstraction rate of B permit water as specified in Condition 11
of consent CRC132458



CRC132458B

Graph CRC132458B Maximum allowable abstraction rate of A permit water, as specified in Condition 12 of consent CRC132458



APPENDIX 4

Consent conditions for CRC147370 to divert up to 1,000 litres per second of water from the mainstem of the Waiau River, at or adjacent to the Leslie Hills Road Bridge intake operated by Amuri Irrigation Company Limited

- 1 The diversion of up to 1,000 litres per second of water may only be taken from the Waiau River at or adjacent to the Leslie Hills Road Bridge (Top50 BU24:8369-7358) either through the existing intake operated by Amuri Irrigation Company Limited or through an enlarged intake constructed by the consent holder and under the control of Amuri Irrigation Company Limited.
- 2 The consent holder may divert:
 - (a) A permit water authorised to be taken by the Amuri Irrigation Company Limited at the Leslie Hills intake provided that:
 - (i) the consent holder obtains the prior written approval of Amuri Irrigation Company Limited before the first diversion of A permit water under this consent; and
 - (ii) the consent holder can demonstrate to the satisfaction of the Canterbury Regional Council, Attention: RMA Monitoring and Compliance Manager that this take is not being fully exercised on that day and that the total of the A permit water diverted by the consent holder and the Amuri Irrigation Company Limited does not exceed 11,000 litres per second; and
 - (b) B permit water.
- 3 The purpose of the diversion is to facilitate the passage and screening of fish.
- 4 The diversion of up to 1,000 litres per second shall be discharged back to the Waiau River in accordance with CRC142438 (or any subsequent variation or replacement consent).
- 5 Restrictions on diverting B permit water:
 - (a) Whenever the:
 - (i) mean flow in the Waiau River for the 24 hour period ending at noon on any one day falls below 37.83 cubic metres per second at the Marble Point recorder, the diverting of water in terms of this consent shall cease;
 - (ii) mean flow in the Waiau River for the 24 hour period ending at noon on any one day falls below 48.83 cubic metres per second at the Marble Point recorder, then the rate at which water is diverted and taken shall reduce to that shown on the graph CRC147370A attached and marked **Attachment 1**;
 - (iii) Canterbury Regional Council, in consultation with a Water User Committee representing water users who are subject to the same restrictions, has determined a water sharing regime that restricts the

taking of water to that available to those consent holders who are members of the same Water User Committee above the minimum flow in clause (i) of this condition, then the taking of water in accordance with that determination shall be deemed to be in compliance with clause (ii) of this condition.

6 Restrictions on diverting A permit water:

(a) Whenever the:

- (i) Mean flow in the Waiau River for the 24 hour period ending at noon on any one day falls below 20 cubic metres per second, the diverting of water in terms of this consent shall cease.
- (ii) Mean flow in the Waiau River for the 24 hour period ending at noon on any one day falls below 37.83 cubic metres then the rate at which water is diverted under this consent and CRC951305 shall not exceed the rate shown on the graph CRC147370B attached and marked **Attachment 2**;
- (iii) Canterbury Regional Council, in consultation with a Water User Committee representing water users who are subject to the same restrictions, has determined a water sharing regime that restricts the taking of water to that available to those consent holders who are members of the same Water User Committee above the minimum flow in clause (i) of this condition, then the taking of water in accordance with that determination shall be deemed to be in compliance with clause (ii) of this condition.

7 Fish return flows diverted under this consent shall where practicable be maintained continuously, at a rate of at least 800 litres per second and up to 1,000 litres per second, and to ensure a minimum rifle depth of 24 cm at all times in the diversion channel between the point of water take and point of return to a permanent braid of the Waiau River not more than 3,500 m downstream.

8 The diversion shall ensure the unimpeded upstream and downstream passage of fish past the intake and ensure a minimum rifle depth of 24 cm at all times in the Waiau River between the point of diversion and the point of return to a permanent braid of the Waiau River, and shall not cause the stranding or accumulation of fish in pools or channels at or below the diversion point.

9 The diversion shall not obstruct or alter the passage of water in a manner that causes:

- (a) an increase in the risk or potential for flooding of surrounding lands; or
- (b) destabilisation of lawfully established structures within the bed of the river; or
- (c) an increase in erosion of the river bed or banks; or
- (d) an increase in deposition on the river bed.

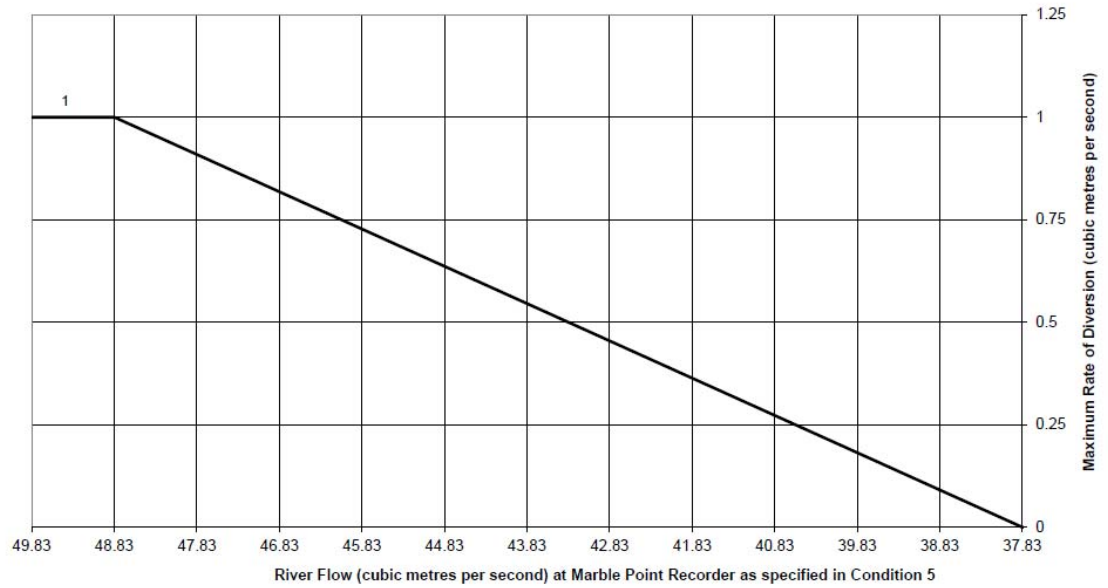
10 The construction of an enlarged intake on the Waiau River at Leslie Hills Rd Bridge shall be undertaken in accordance with certified design plans approved by the Canterbury Regional Council through a civil works consenting process.

- 11 The Canterbury Regional Council may, on any of the last five working days of May or November in any year, serve notice of its intention to review the conditions of this consent for the purpose of dealing with any adverse effect on the environment, which may arise from the exercise of the consent and which it is appropriate to deal with at a later stage.
- 12 The consent shall expire on 25 March 2033.
- 13 The lapsing date for the purposes of section 125 shall be 5 years.

CRC147370A

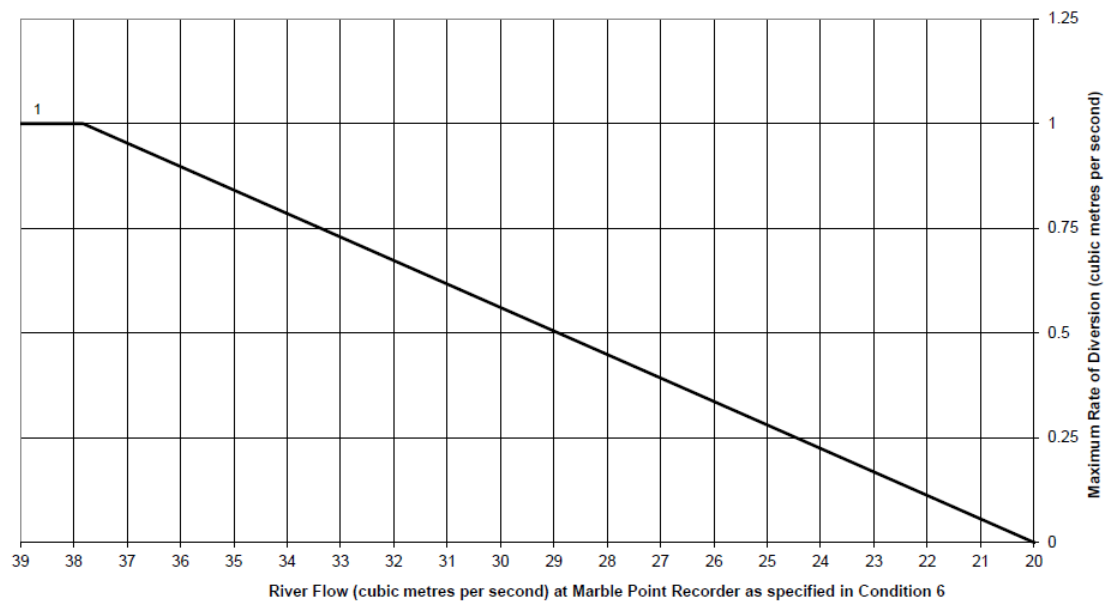
ATTACHMENT 1

Graph CRC147370A Maximum allowable diversion rate when diverting B permit water, as specified in Condition 5 of consent CRC147370.



CRC147370B

Graph CRC147370B Maximum allowable diversion rate when diverting A permit water, as specified in Condition 6 of consent CRC147370



APPENDIX 5

Consent conditions for CRC147369: To use water for the irrigation of Land and for dairy shed washdown water and stockwater

Definitions

HWRRP *means* the operative Hurunui and Waiau River Regional Plan dated 20 December 2013.

Land *means* 7,000 ha of the land contained within 8,596 ha of land shown on Plan **NTFE 1** attached to and forming part of this consent excluding the Restricted Areas shown on that plan and on Plan **NTFE 2**.

Receipt and Use of Water

- 1 No water shall be used on the Land unless the land use is a permitted activity under the HWRRP or the land is subject to a consent authorising the use of land which specifies the maximum annual amount of nitrogen that may be leached and measures to minimise the loss of phosphorus.
- 2 The consent holder may only use water authorised to be taken under Consent CRC132458 when giving effect to this consent.
- 3 Water shall only be used on the Land:
 - (a) for irrigation;
 - (b) to fill storage reservoirs prior to irrigation; and
 - (c) for stockwater and dairy shed operations.
- 4 Notwithstanding Condition 3, the consent holder shall not irrigate the restricted former wood treatment site ('Restricted Land') identified on the attached Plan **NTFE 2** until the consent holder has:
 - (a) engaged a suitably qualified and experienced independent consultant to conduct an environment site assessment of the Restricted Land and produce an environmental report ("Initial Environmental Report"). The Initial Environmental Report will include the:
 - (i) results of an investigation of the soil and groundwater of the Restricted Land for the presence of contaminants in accordance with the relevant and current guidelines issued by the Ministry for the Environment for the assessment and management of contaminated sites in New Zealand; and
 - (ii) an outline of any required remediation, if necessary, to allow for the land to be irrigated;
 - (b) if recommended in the Initial Environmental Report, engaged a qualified and experienced independent consultant to:
 - (i) overview and undertake any necessary remediation required before the land can be irrigated;

- (ii) provide an environmental report ("Final Environmental Report") certifying the land can be irrigated; and
- (c) prepared a Report setting out the results of the Initial Environmental Report and, if required, the Final Environmental Report. The consent holder shall submit the Report for certification to the Canterbury Regional Council (Attn: RMA Compliance and Enforcement Manager); and
- (d) the Canterbury Regional Council has certified the Restricted Land can be irrigated.

Efficient Use of Water

- 5 The total annual volume of water supplied to the farm gate between 1 July and the following 30 June for use on the Land:
 - (a) for irrigation shall not exceed 10 million cubic metres, and
 - (b) for stock water and dairy shed operations shall not exceed 164,000 cubic metres.
- 6 At least six months prior to the exercise of this consent, the consent holder shall provide to Canterbury Regional Council (Attn: RMA Compliance and Enforcement Manager) details of the maximum annual volume of water which will be used on the land under this consent to undertake the development authorised under consent CRC144066.
- 7 Where the maximum annual volume of water that will be used, as advised to Canterbury Regional Council under condition 6, is less than:
 - (i) 10 million cubic metres for irrigation; and/or
 - (ii) 164,000 cubic metres for stock water and dairy shed operations;
 the consent holder shall surrender that volume of water that will not be used.
- 8 The consent holder shall take all practicable steps to:
 - (a) ensure that the rate and volume of water used for irrigation does not exceed that required for the soil to reach field capacity; and
 - (b) ensure that the rate and volume of water used for stockwater and dairy shed operations does not exceed the use reasonably necessary for that purpose;
 - (c) avoid the application of water onto non-productive land such as impermeable surfaces and river or stream riparian strips; and
 - (d) avoid surface run-off from irrigation, and
 - (e) avoid leakage from pipes and structures.
- 9 The daily application rate of water used for the irrigation shall not exceed 0.58 litres per second per hectare on average, provided that this application rate shall be reduced in situations where the soil moisture may exceed field capacity.
- 10 Irrigation shall be by spray or drippers only.

- 11 Irrigation scheduling shall be supported by weather forecasting, daily rainfall, evapotranspiration and soil moisture monitoring to ensure the efficient water use and the avoidance of soil moisture exceeding field capacity.

Water Use Metering

- 12 Prior to the use of water under this consent, the consent holder shall install one or more flow measuring devices to continuously measure the rate and volume of water supplied to farms on the Land.
- 13 The water meter and recording device(s) shall:
- (a) have an International or New Zealand accredited calibration endorsement capable of measuring to within an accuracy of plus or minus 5 percent; and
 - (b) be installed and maintained throughout the duration of the consent in accordance with the manufacturer's instructions to ensure it remains fully functional at all times.
- 14 The measuring devices shall, as far as is practicable, be installed at sites likely to retain a stable rating, i.e. a man-made channel, concrete, steel or fibreglass flume or pipe. Installation shall be in accordance with ISO 1100/1-1981 or equivalent by a suitably qualified or experienced person.
- 15 The rates and times of water supply shall be recorded by electronic means, at no greater than fifteen minute intervals, with a tamper-proof recording device such as a data-logger. The recorded data shall not be changed or deleted by any person, until after twelve months have passed since the date of recording.
- 16 All recorded data shall be accessible and available for supply or downloading upon request by the Canterbury Regional Council.
- 17 Prior to 31 August each year, the consent holder shall (for the year ending 30 June) provide to the Canterbury Regional Council a report:
- (a) Containing a map and schedule of the land irrigated in the prior year;
 - (b) Detailing the quantity of water:
 - (i) supplied to the land and the source of that water;
 - (ii) used for stock water and dairy shed purposes; and
 - (iii) used for irrigation.

Annual Report

- 18 An annual report shall be prepared and provided to the Canterbury Regional Council Attention RMA Monitoring and Compliance Manager by 31 August each year for the prior year ending 30 June. This report shall include all reporting obligations referred to in this consent.

Review and Term

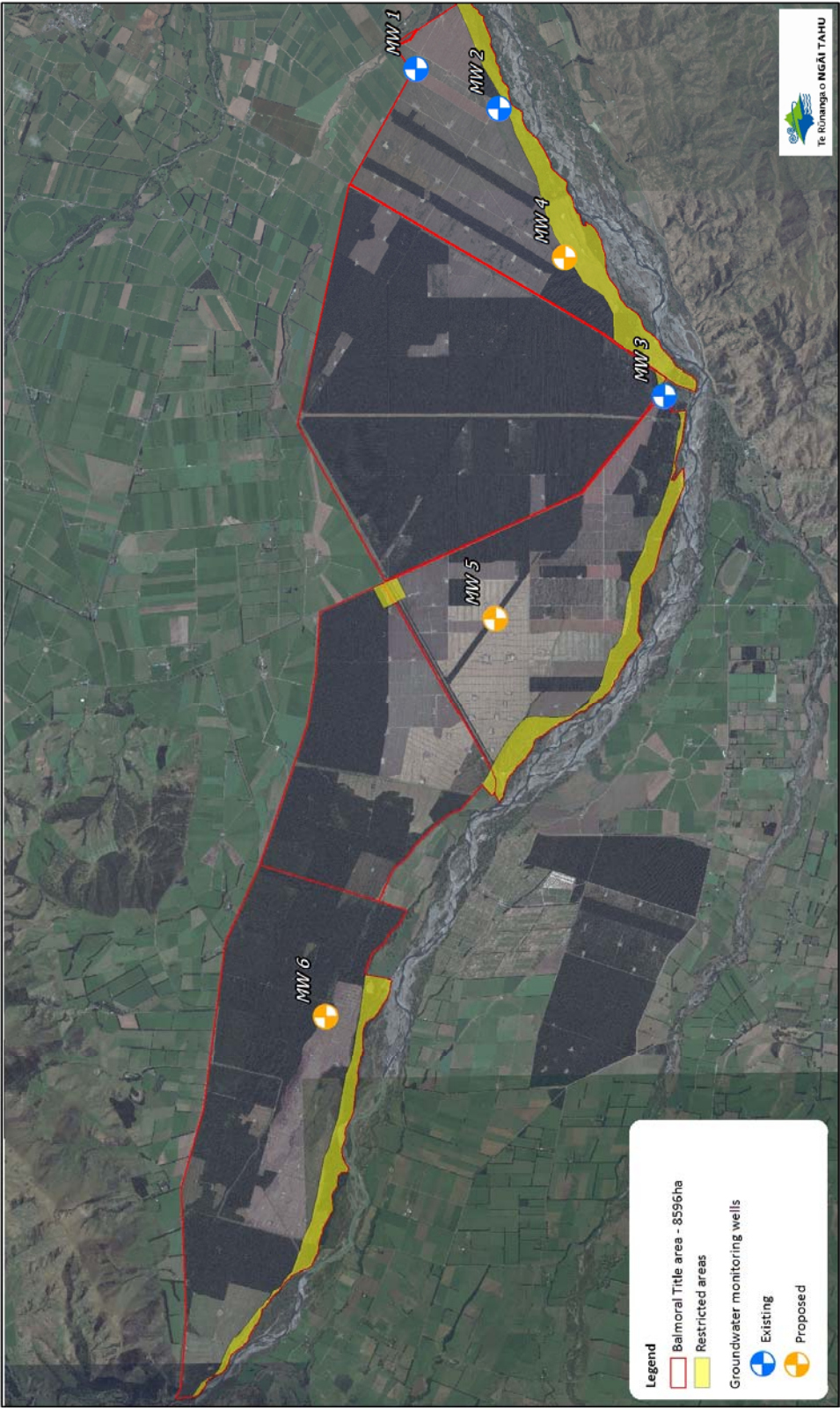
- 19 The Canterbury Regional Council may, on any of the last five working days of May or November in any year, serve notice of its intention to review the conditions of this consent for the purpose of dealing with any adverse effect on the

environment, which may arise from the exercise of the consent and which it is appropriate to deal with at a later stage.

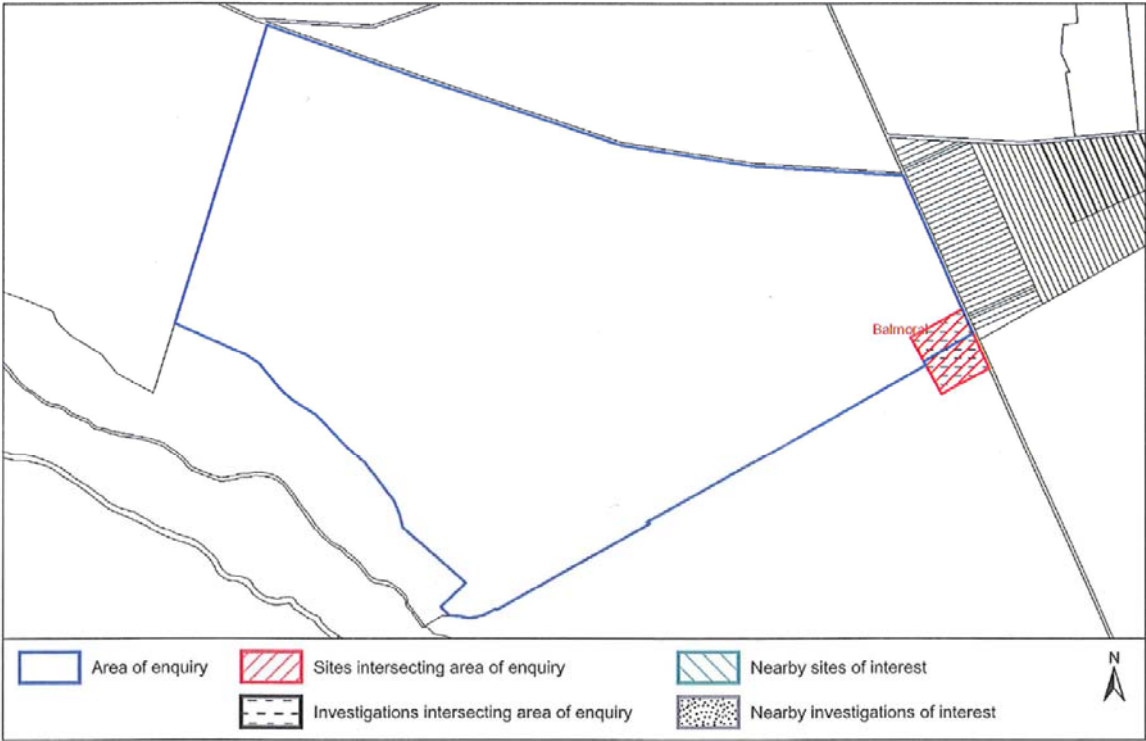
20 The consent shall expire on 25 March 2033.

21 The lapsing date for the purposes of section 125 shall be 5 years.

Irrigable Land (7,000 ha within red perimeter) excluding Restricted Land (yellow)



Restricted Land (Red)



Summary of sites:

Site ID	Site Name	Location	HAIL Activity(s)	Category
148	Balmoral Forest	Balmoral Station Road, Culverden	A18 - Wood treatment or preservation and bulk storage of treated timber	Not Investigated

Please note that the above table represents a summary of sites intersecting the area of enquiry within a 100m buffer.

APPENDIX 6

Consent conditions for CRC142438: To Discharge up to 1,000 litres per second of water to the Waiau River approximately 2,700 m downstream of the Leslie Hills Road Bridge

- 1 The discharge shall occur at approximate map reference Topo 50 BU24: 8675-7209 and shall return the diverted water to a permanent braid of the Waiau River not more than 3,500 m downstream from the point of diversion.
- 2 The volume of water discharged shall not exceed a rate of 1,000 litres per second.
- 3 The discharge shall not occur while the existing discharge authorised under CRC951309 (or variation thereof) held by Amuri Irrigation Company Limited is being discharged.
- 4 The discharge shall not cause any increase in suspended sediment concentration in the Waiau River after reasonable mixing.
- 5 The Canterbury Regional Council may, on any of the last five working days of May or November in any year, serve notice of its intention to review the conditions of this consent for the purpose of dealing with any adverse effect on the environment, which may arise from the exercise of the consent and which it is appropriate to deal with at a later stage.
- 6 The consent shall expire on 25 March 2033.
- 7 The lapsing date for the purposes of section 125 shall be 5 years.

APPENDIX 7

Consent conditions for CRC144606 to change land use and discharge nutrients to Land

Definitions

"HWRRP" *means* the operative Hurunui and Waiau River Regional Plan dated 20 December 2013

"Land" *means* 8,596 ha of the land shown on Plan and Schedule marked **NTFE 1** attached to and forming part of this consent.

Nutrient Limits

1 The maximum annual amount of nitrogen that may be leached below the root zone under the Land as Best Practice may not exceed 6.6 kg/ha/yr (57.2 tonnes/yr) calculated using OVERSEER® or an alternative nutrient budget model approved by Canterbury Regional Council (*N Limit*).

2 The consent holder shall, at least six months prior to exercising this consent, submit to the Canterbury Regional Council (Attn: RMA Compliance and Enforcement Manager) a description of the land use activities which will occur on the Land, including identifying on what part of the Land the use will occur, and using OVERSEER® or an alternative nutrient budget model approved by Canterbury Regional Council, demonstrate that the N limit in Condition 1 will be met.

3 Land use activities on the Land shall not cause any increase in the concentration of Dissolved Reactive Phosphorus in the groundwater beneath the Land.

Advice Note: The concentration of Dissolved Reactive Phosphorus will be determined in accordance with the groundwater monitoring undertaken under this consent.

4 At least six months prior to the exercise of this consent, the consent holder shall form or join a water user group or catchment management group after full consultation with the Canterbury Regional Council to achieve the whole catchment limits for water use and limits on nutrient loss in this consent and in the HWRRP.

5 The consent holder shall during the term of this consent demonstrate best practice nutrient management to achieve a stable or declining trend in the rate (kg/ha/yr) of nitrate-nitrogen leaching from the Land.

6 On the area identified as "Eyre Soils" in the plan attached and marked **NTFE 2** to this consent having high phosphorus leaching vulnerability, the consent holder shall ensure it undertakes specific measures to minimise the amount of Phosphorus that is lost, including, but not limited to, the use of slow release phosphorus fertilisers. These specific measures will be clearly detailed within the FEMP.

7 The consent holder will not irrigate or actively farm the Restricted Areas that are adjacent to the Hurunui River and the former wood treatment site shown and coloured yellow on the plan attached and marked **NTFE 3** to this consent.

Waypoint Review

- 8 Concurrently with the review of CRC120675 under General Condition 45(c) applying to that consent, the consent holder shall prepare and submit a Nutrient Management Report to the Canterbury Regional Council.
- 9 The Nutrient Management Report prepared in accordance with Condition 8 shall assess the following matters:
 - (a) the current land use on the Land and the existing estimated loss of nitrogen from the Land using OVERSEER® or an alternative nutrient budget model approved by Canterbury Regional Council;
 - (b) the extent to which further land use change can occur within the limits set in this consent while achieving compliance within the load limits specified in Schedule 1 of the HWRRP, attached to this consent as **Attachment 1** (taking into account land use change and waypoint limits authorised in all other relevant resource consents, including the limits in CRC120675).

Breach of Dissolved Inorganic Nitrogen Load Limit

- 10 If the Dissolved Inorganic Nitrogen Load limit contained in Schedule 1 of the HWRRP is breached (and to the extent all other consent holders are complying with their consent conditions and land users are complying with the HWRRP) then notwithstanding any other condition in this consent, the consent holder will take steps to ensure compliance with this condition within 2 years of the breach occurring.

Advice note: The N Limit provides for a 2.7% (out of the total 25% increase from the 2005-2011 level) in the Dissolved Inorganic Nitrogen Load as contained in Schedule 1 of the HWRRP.

Farm Environment Management Plans (FEMPs)

- 11 The consent holder shall prepare, maintain, implement and audit one or more Farm Environmental Management Plans in respect of the Land (FEMP).
- 12 The FEMP(s) shall be developed in general accordance with **Attachment 2** attached to and forming part of this consent.
- 13 The FEMP(s) shall take into account all sources of nutrients used for the farming activity and identify all relevant nutrient management practices and mitigation measures. Industry articulated best management practices shall be implemented on the Land to minimise the loss of nitrogen below the plant root zone and the loss of phosphorus from the Land.
- 14 The consent holder shall supply a copy of the FEMP(s) to the Canterbury Regional Council at least six months prior to the exercise of this consent, and thereafter at two yearly intervals on or before 31 August (for the prior year ending 30 June).
- 15 Without limiting Condition 12, the FEMP(s) shall include:
 - (a) procedures to:
 - (i) Ensure that all irrigation systems on the property area are operated to meet industry articulated good practice irrigation having regard for the particular soil types and climate of the property;

- (ii) Maximise water application effectiveness while minimising excess drainage and runoff;
 - (iii) Minimise the incidence of wind and/or water erosion caused as a result of farming practices;
 - (iv) Minimise nitrogen and phosphorous loss to ground water and surface water through nutrient budgeting and measures to manage nitrogen and phosphorous loss;
 - (v) Minimise the risk of groundwater and surface water contamination by nutrients and microbial pathogens by managing animal effluent to meet industry articulated good management practice standards; and
 - (vi) Establish performance targets and to record and measure performance against targets;
- (b) an environmental risk assessment of the farming activity completed by a suitably qualified and experienced person; and
- (c) an audit procedure, including a requirement on the consent holder to audit the FEMP(s) and on-farm practices at least once every two years, provided that:
- (i) the audit is undertaken by a suitably qualified independent assessor appointed by the consent holder. The purpose of the audit shall be to ensure that the FEMP(s) and on-farm practices demonstrate compliance with both industry articulated good management practices and the conditions of this consent;
 - (ii) After three consecutive audits confirming compliance with Condition 15 (a), the frequency of independent audits may occur once every three years; and
 - (iii) If the three-yearly audit fails to confirm compliance with Condition 15 (a), then independent audits will be required annually until full compliance has been achieved for three consecutive independent audits.
- 16 Prior to 31 August of every second year, the consent holder shall compile all FEMPs and supply this information, together with a compliance schedule, map and latest audit report, to the Canterbury Regional Council Attention RMA Monitoring and Compliance Manager.

Groundwater Quality Monitoring

- 17 At least six months prior to the exercise of this consent, the consent holder shall install a minimum of three additional groundwater sampling wells, for the purpose of monitoring the discharge of contaminants to groundwater as a result of land use on the Land. The location of these wells shall be determined in consultation with Canterbury Regional Council and shall take into account the location of proposed land use activities on the Land, as advised to Canterbury Regional Council in accordance with Condition 2.
- 18 At least six months prior to the exercise of this consent, the consent holder shall commence the monitoring of groundwater quality in the three bores marked MW03 (N33/0125) and bores MW01 (BV24/0021) and MW02 (BV24/0022) as

shown on Plan NTFE 3 attached to and forming part of this consent, and the three additional wells referred to in Condition 17.

- 19 New monitoring bores (other than for MW03 (N33/0125)) installed to comply with Condition 17 should be screened from two metres below the lowest seasonal groundwater level to one metre above the highest seasonal groundwater level. All samples should be collected using low-flow sampling within 1 metre of the water table. Samples should be collected in accordance with the requirements of the Ministry for the Environment 2006 document, *A National Protocol for State of the Environment groundwater sampling in New Zealand*. This includes the measurement of groundwater levels prior to each sampling exercise commencing and the pH, temperature and electrical conductivity of the groundwater shall be monitored in the field and recorded during the purging process prior to sampling. Where low flow sampling is to occur, the consent holder should collect samples in accordance with the *Low-Flow Sampling Technique* (Environment Canterbury, 2013).
- 20 Groundwater quality and groundwater level samples shall be undertaken quarterly and shall commence at least 12 months prior to the exercise of this consent.
- 21 Initially, the water quality analyses shall include Nitrate Nitrogen, Ammonia Nitrogen, Nitrite Nitrogen, Total Kjeldahl Nitrogen, Dissolved Reactive Phosphorus, Total Filtered Phosphorus, Chloride, pH, Conductivity, Sulphate, and *E. coli*.
- 22 The number of bores sampled and the frequency of samples taken and quality measures analysed may be revised from time to time in consultation with the Monitoring and Compliance Manager for the Canterbury Regional Council. However, bore sampling will be undertaken throughout the term of this resource consent.
- 23 If bore MW03 (N33/0125) providing drinking water to the Balmoral Forest Reserve, or any other bore on the property used to supply drinking water, is affected by the consent holder's activities and either:
 - (a) exceeds a nitrate-nitrogen concentration of 11.3 grams per cubic metre; or
 - (b) has detectable *E. Coli* (determined as one coliform forming unit per 100 millilitre sample) that is confirmed by a repeat sampling within 7 days and is not likely to be caused by localised contamination sources in or nearby to the well head or due to sample handling;

then the consent holder shall immediately supply an alternative drinking water supply or appropriate treatment system until it can demonstrate that the concentration of nitrate-nitrogen in the subject bore is below 11.3 grams per cubic metre and/or the *E. Coli* concentration is less than 1 cfu/100 ml.

Riparian Planting and Public Access

- 24 Within 5 years of this consent being granted the consent holder shall, in consultation with Te Rūnanga o Kaikōura prepare a Riparian Planting Management Plan and provide it to the Canterbury Regional Council (Attn: RMA Compliance and Enforcement Manager) promoting shelter and native riparian planting along the margin of the Hurunui River adjacent to the consent holder's property and which also provides public access (on foot or bicycle) upstream of SH7.

Annual Report

- 25 Prior to 31 August each year, the consent holder shall provide to the Canterbury Regional Council (Attn: RMA Compliance and Enforcement Manager) (for the prior year ending 30 June) an Annual Report containing:
- (a) a map of the Land detailing the land use, where that land use is occurring, and any irrigation occurring on the Land;
 - (b) an estimate (using OVERSEER® or an alternative nutrient budget model approved by Canterbury Regional Council) of the total annual loss of nitrogen below the plant root zone (tonnes/year) arising from the exercise of this consent;
 - (c) an evaluation of the groundwater monitoring data collected under this consent and the surface water monitoring data collected by the Canterbury Regional Council (and other verifiable sources) to assess whether there is any leaching of Dissolved Reactive Phosphorous resulting from the land use activities on the Land;
 - (d) electronic copies of OVERSEER® files and justification for inputs to OVERSEER® used to estimate the total annual loss of nitrogen below the plant root zone (tonnes/year) in accordance with (b);
 - (e) the farm management practices implemented in accordance with Conditions 5 and 6;
 - (f) an Irrigation Scheme Management Plan or an Industry Certification System that complies with Schedule 2 of the HWRRP, attached to this consent as **Attachment 3**, containing an Environmental Management Strategy, Management Objectives and a Description of the Audit and Reporting Process appropriate for land use on the Land;
 - (g) details of compliance with the Groundwater Quality Monitoring Conditions 17 to 23 and the results of monitoring and trends in attributes measured.

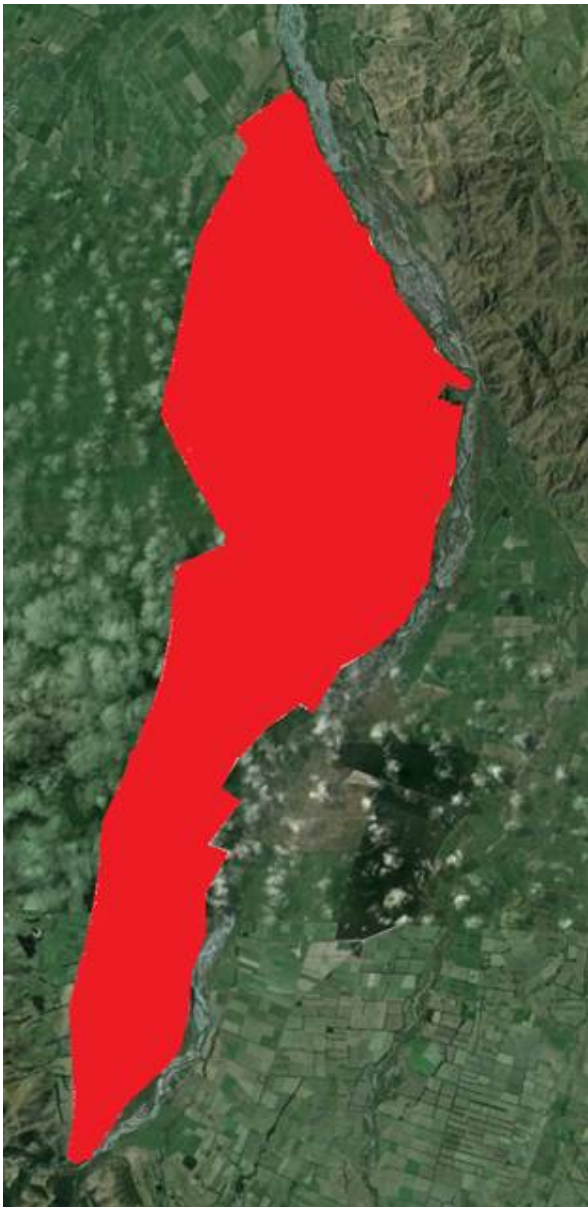
Review and Term

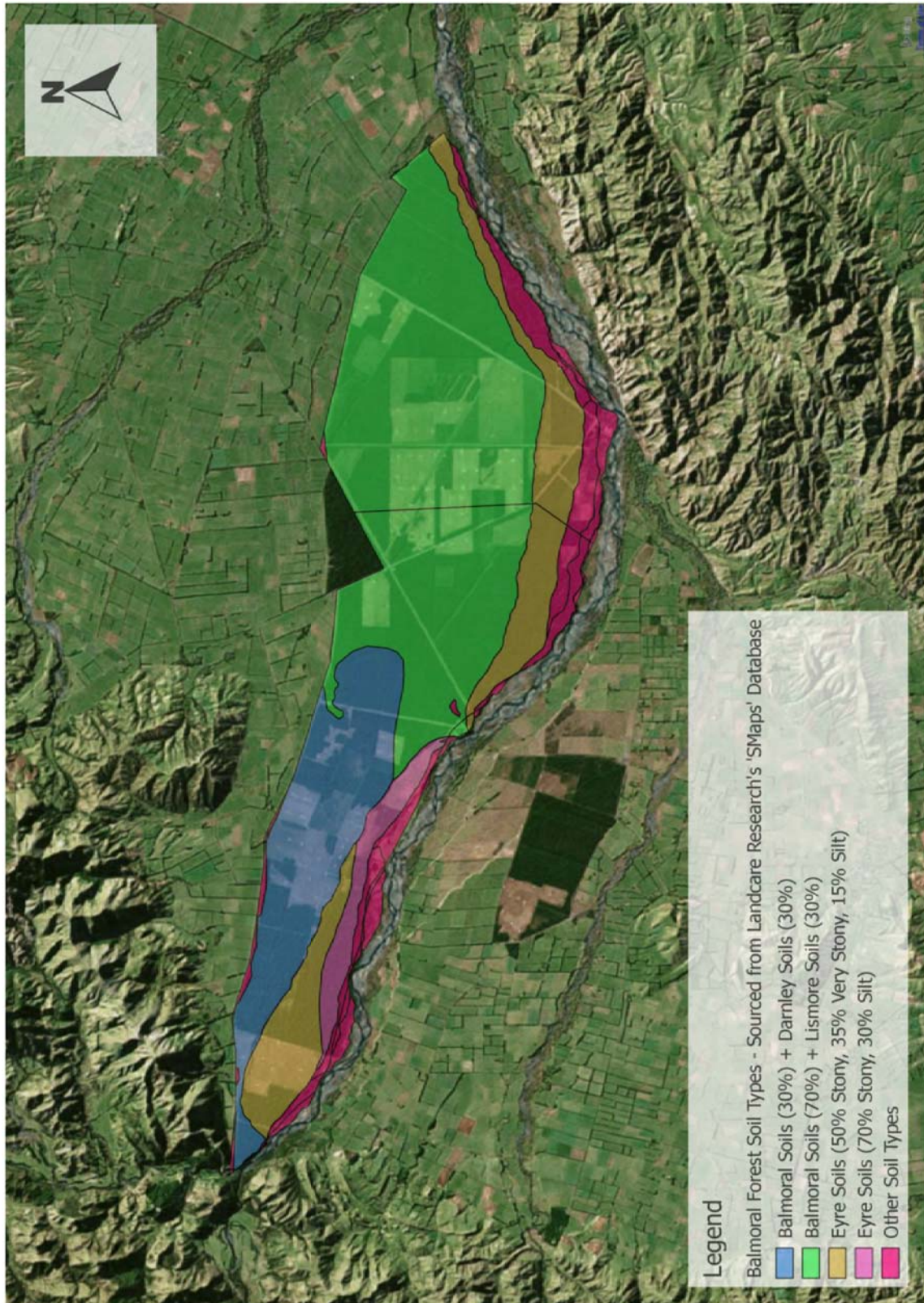
- 26 (a) Upon receipt of the Nutrient Management Report prepared in accordance with Conditions 8 and 9, the Canterbury Regional Council may review the conditions of this consent pursuant to section 128(1) of the Resource Management Act 1991 for the purpose of avoiding, remedying, or mitigating any adverse effect on the environment arising from the exercise of this consent or any increased risk of future non-compliance with the conditions of this consent or any breach of the dissolved inorganic nitrogen load limits specified in Schedule 1 of the HWRRP or the dissolved reactive phosphorous concentration in Policy 5.3(c).
- (b) The review shall include consideration of whether the maximum annual rate at which nitrogen may be leached below the root zone under the Land set out in Condition 1 should be reduced, in order to ensure compliance with the load and policy limits to the extent the breach is all, or in part, caused by the consent holder's activities on the Land.
- (c) The review shall have regard to the contributions of other persons lawfully entitled (at the time the Canterbury Regional Council reviews the conditions of this consent) to discharge nitrogen and phosphorous to water, where such discharge contributes to the load limits in Schedule 1 of the HWRRP.

- 27 Notwithstanding Condition 26, the Canterbury Regional Council may, on any of the last five working days of November in any year, serve notice of its intention to review the conditions of this consent for the purpose of dealing with any adverse effect on the environment, including any adverse effect identified in the Annual Report provided in accordance with Condition 25, and including any breach of the dissolved reactive phosphorous limit within Policy 5.3(c) of the HWRRP, which may arise from the exercise of the consent and which it is appropriate to deal with at a later stage.
- 28 The consent shall expire on 25 March 2033.
- 29 The lapsing date for the purposes of section 125 shall be 5 years.

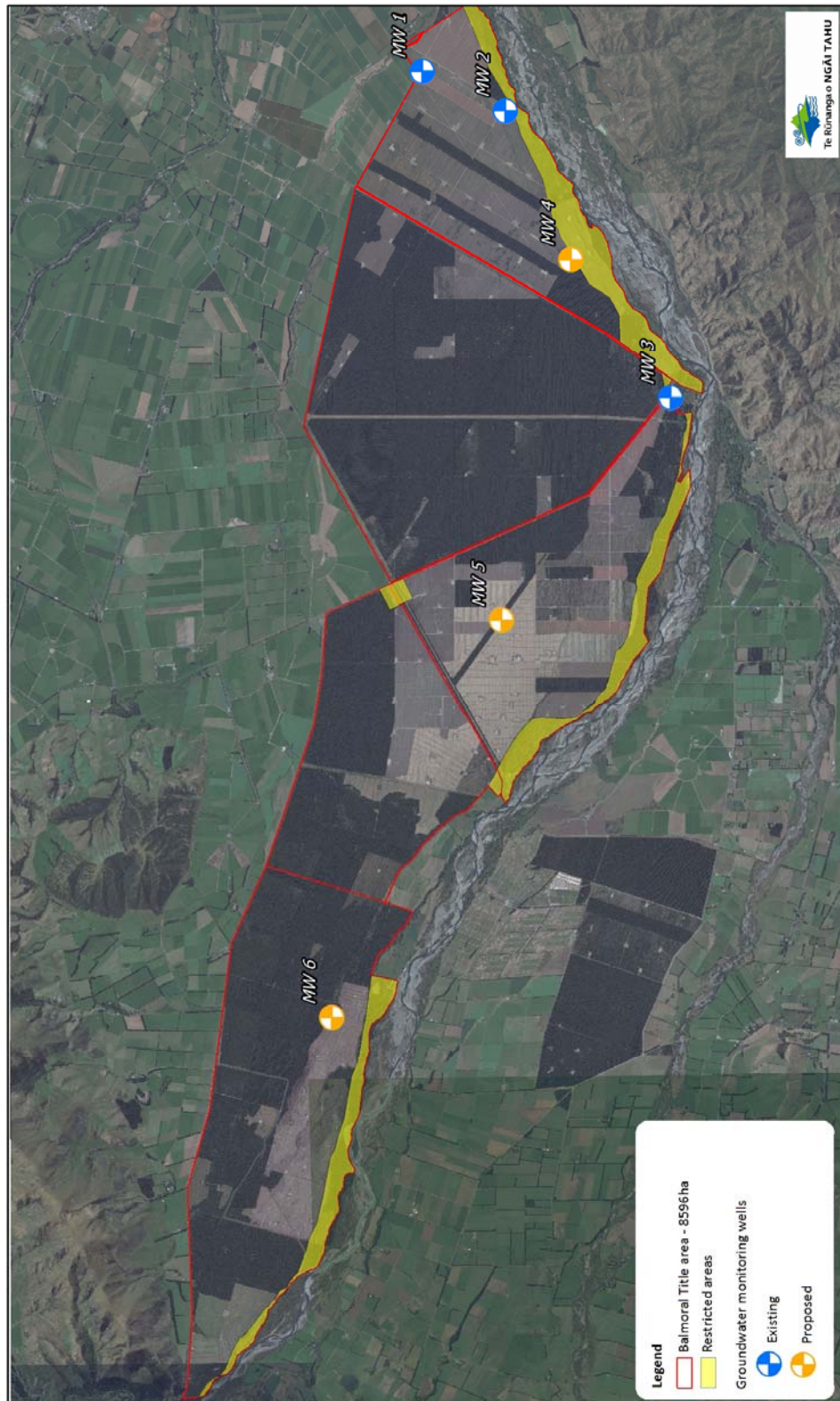
NTFE 1

Land Registry	Computer Freehold Register	Lot No	Title Area (hectares)
Canterbury	192387	Lot 1 DP 56489	1,996.4200
Canterbury	192384	Lot 2 DP 56488	1,251.4800
Canterbury	202656	Lot 3 DP 56488, Lot 1 DP 59813	1,590.3150
Canterbury	192386	Lot 4 DP 56488	2,494.9500
Canterbury	217019	Lot 7 & 8 DP 56490	1,262.8730
			8,596.0380





Irrigable land (7,000 ha within the red perimeter) excluding Restricted Areas (yellow)



Schedule 1 of the HWRRP, operative December 2013

5.2 Schedule 1: Catchment Nutrient Load Limits

Catchment	Monitoring site location	Nutrient Load Limits	
		Dissolved Inorganic Nitrogen (tonnes/ year)	Dissolved Reactive Phosphorus (tonnes /year)
Hurunui Catchment	Mandamus flow recorder	39	3.2
	State Highway One flow recorder	963	10.7

Note: The Dissolved Inorganic Nitrogen limit at Mandamus is the 2005-2011 average annual instream load. The Dissolved Inorganic Nitrogen limit at State Highway One is the 2005-2011 average annual load increased by 25%.

The Dissolved Reactive Phosphorus limits at Mandamus and State Highway One are the 2005-2011 average annual instream loads.

Part A – Farm Environment Plans

A Farm Environment Plan shall apply to the area of land specified in Consent Condition 1 and can be based on either of:

1. The material set out in Part B below;
- OR
2. Industry prepared Farm Environment Plan templates and guidance material that:
 - (a) Include the following minimum components:
 - (i) The matters set out in 1, 2, 3 and 6 of Part B below;
 - (ii) Contains a methodology that will enable development of a plan that will identify actual and potential environmental effects and risks specific to the property, addresses those effects and risks and has a high likelihood of appropriately avoiding, remedying or mitigating those effects;
 - (iii) Performance measures that are capable of being audited as set out in Part C below; and
 - (b) Has been approved as meeting the criteria in (a) and being acceptable to the Canterbury Regional Council by the Chief Executive of the Canterbury Regional Council.

Part B – Farm Environment Plan Default Content

The plan shall contain as a minimum:

1. Property or farm enterprise details
 - a. Physical address
 - b. Description of the ownership and name of a contact person
 - c. Legal description of the land and farm identifier
2. A map(s) or aerial photograph at a scale that clearly shows:
 - a. The boundaries of the property or land areas comprising the farm enterprise.
 - b. The boundaries of the main land management units on the property or within the farm enterprise.
 - c. The location of permanent or intermittent rivers, streams, lakes, drains, ponds or wetlands.

¹ Attachment 2 has been derived from Schedule 7 of the proposed Land and Water Regional Plan (Decisions version notified on 18 January 2014)

- d. The location of riparian vegetation and fences adjacent to water bodies.
 - e. The location on all waterways where stock access or crossing occurs.
 - f. The location of any areas within or adjoining the property that are identified in a District Plan as "significant indigenous biodiversity".
3. A list of all Canterbury Regional Council resource consents held for the property or farm enterprise.
4. An assessment of the adverse environmental effects and risks associated with the farming activities and how the identified effects and risks will be managed, including irrigation, application of nutrients, effluent application, stock exclusion from waterways, offal pits and farm rubbish pits.
- 5 A description of how each of the following objectives will, where relevant, be met.
- a) Nutrient management: To maximise nutrient use efficiency while minimising nutrient losses to water.
 - b) Irrigation management: To operate irrigation systems efficiently and ensuring that the actual use of water is monitored and is efficient.
 - c) Soils management: To maintain or improve the physical and biological condition of soils in order to minimise the movement of sediment, phosphorus and other contaminants to waterways.
 - d) Collected animal effluent management: To manage the risks associated with the operation of effluent systems to ensure effluent systems are compliant 365 days of the year.
 - e) Livestock management: To manage wetlands and water bodies so that stock are excluded as far as practicable from water, to avoid damage to the bed and margins of a water body, and to avoid the direct input of nutrients, sediment, and microbial pathogens.
 - f) Offal pits: to manage the number and locations of pits to minimise risks to health and water quality

The plan shall include for each objective in 5 above;

- a. detail commensurate with the scale of the environmental effects and risks;
 - b. defined measurable targets that clearly set a pathway and timeframe for achievement and set out defined and auditable "pass/fail" criteria;
 - c. a description of the good management practices together with actions required; and
 - d. the records required to be kept for measuring performance and achievement of the target.
- 6 A nutrient budget shall be prepared annually using the current version of the OVERSEER™ nutrient budget model, or equivalent model approved by the Chief Executive of Environment Canterbury, to cover the land specified in Consent Condition 1 for the upcoming 12 months. At the end of each 12 month period the modelling shall be revised, if necessary, to accommodate any differences between

the projected modelling and actual farm practise, to calculate the average annual amount of nitrogen loss to water from the subject land.

Part C – Farm Environment Plan Audit Requirements

The Farm Environment Plan must be audited by a Farm Environment Plan Auditor who is independent of the farm being audited (i.e. is not a professional adviser for the property) and has not been involved in the preparation of the Farm Environment Plan.

A Farm Environment Plan Auditor is a person who can provide evidence of at least 5 years' professional experience in the management of pastoral, horticulture or arable farm systems and holds either:

1. a Certificate of Completion in Sustainable Nutrient Management in New Zealand Agriculture from Massey University;
2. a Certificate of Completion in Advanced Sustainable Nutrient Management in New Zealand Agriculture from Massey University; or
3. such other qualification that has been approved by the Chief Executive of the Canterbury Regional Council as containing adequate instruction and assessment on agricultural sciences and nutrient management.

The farming activity occurring on the property will be audited against the following minimum criteria:

1. An assessment of the performance against the objectives, targets, good practices and timeframes in the Farm Environment Plan;
2. An assessment of the robustness of the nutrient budget/s;
3. An assessment of the efficiency of water use (if irrigated).

The audit shall identify any non-compliance with the Farm Environment Plan, detail any action required to remedy instances of non-compliance and provide an overall grade based on the assessment of the property.

Schedule 2 of the HWRRP, operative December 2013

5.3 Schedule 2: Matter to be addressed in any System, Agreement or Plan in accordance with Rules 10.1 and 10.2

Rules 10.1 and 10.2 require any land use in the area marked as a nutrient management area on Map 4 implement, on, or before 1 January 2017, one of either:

- an Industry Certification System; or,
- a Catchment Agreement; or,
- an Irrigation Scheme Management Plan; or,
- a Lifestyle Block Management Plan.

This schedule sets out the basic requirements that any one of the above Plans, Systems or Agreements ('The Programme') must contain and address for it to be approved by the Canterbury Regional Council.

1. An Environmental Management Strategy

The 'Environmental Management Strategy' sets out the protocols and procedures that the Programme will follow in its development, implementation and maintenance.

As a minimum the 'Environmental Management Strategy' shall include:

- (a.) Details relating to the governance arrangements of the Programme.
- (b.) A description of the Programme area including management areas within it, land uses, key environmental issues and risks, property boundaries and ownership details.
- (c.) A statement of the outcomes sought in relation to minimising and mitigating the environmental effects of land use on water quality within the Programme area including an objective of reducing phosphorus loss to waterways.
- (d.) A statement of the requirement for farm environment plans which demonstrate how land managers are actively managing the use of natural resources in order to achieve the management objectives as specified in sections 1(e) and 2 below. The farm environment plans shall include (where appropriate) sections relating to:
 - (i) Irrigation management
 - (ii) Soils management
 - (iii) Nutrient management
 - (iv) Wetland and riparian management
 - (v) Collected animal effluent management
- (e.) Specified management objectives for each of the management areas identified in 1(b) above.
- (f.) An inventory of the current (from [date this Plan is made operative]) nitrogen loss rate (kg/ha/year) for each property in the Programme area, as determined by application of Overseer (or an alternative nutrient budget model approved by the Canterbury Regional Council) by a suitably qualified independent practitioner.

- (g.) An assessment of the nutrient management risks associated with the major farming activities on the property (including risks associated with direct runoff into waterways and indirect nutrient losses) and how the identified risks will be managed,
- (h.) A statement of what is industry agreed best nutrient management practice for nitrogen and phosphorus loss rates (in kg/ha/year) for all specified land use types relevant for each management area,
- (i.) A statement of the contractual arrangements between the Programme and individual land managers (the 'Members') who commit to the Programme.
- (j.) A statement of the audit and compliance components of the Programme that the Members shall be required to adhere to.

2. Management objectives

As a minimum all Members shall be required to meet the following management objectives for each of the specified management areas.

(a.) Irrigation management

To use water efficiently, minimising runoff and drainage in order to avoid, remedy or mitigate problems arising from:

- (i) Inefficient water application
- (ii) Ponding of irrigation water
- (iii) Excessive runoff of irrigation water
- (iv) Excessive losses to groundwater

Note:

1. Water use efficiency is required to be at a level of at least 80% application efficiency as per Policy 8.1(c).
2. The application of water using real-time soil and water data is strongly encouraged to ensure water is used to match soil and production demands.
3. A description as to the use of soil moisture monitoring technologies and similar devices to supply accurate information on moisture levels in the soil profile is desirable.

(b.) Soils management

To maintain or improve the physical and biological condition of soils in order to avoid, remedy or mitigate problems arising from:

- (i) Loss of topsoil by wind or water erosion
- (ii) Movement of soils and contaminants into waterways
- (iii) Damage to soil structure and health

(c.) Nutrient management

To maximise nutrient use efficiency while minimising nutrient losses such that industry agreed benchmarks for nitrogen and phosphorus loss rates (kg/ha/year) defined in 1(h) above are achieved or bettered, in order to:

- (i) avoid, remedy or mitigate nitrogen and phosphorus losses through runoff and leaching to ground and surface waters;
- (ii) comply with any limits or targets set within the environmental management strategy.

Notes:

1. All land uses must also comply with Rule WQL19 of the Natural Resources Regional Plan and/or the relevant rule(s) for the discharge of fertiliser in the Land and Water Regional Plan, or consent will be required under the relevant plan(s).
2. Changes of land use within the Programme area may require consent under Rule 11.1 or 11.1A of the HWRRP.

(d.) Wetland and riparian management

To protect the natural waterways and wetlands by, for example, fencing and planting, in order to avoid, remedy or mitigate:

- (i) Stock damage to banks causing sedimentation
- (ii) Nutrient losses to water bodies

Note:

1. All land uses must also comply with Rule WQL21 of the Natural Resources Regional Plan and/or the relevant rule(s) for livestock in the Land and Water Regional Plan, or consent will be required under the relevant plan(s).

(e.) Collected animal effluent management

To manage effluent systems to optimise the productive benefits of effluent while taking all practicable steps to avoid contamination of ground and surface waters in order to avoid, remedy or mitigate contamination of ground and surface waters, especially faecal matter, nitrogen and phosphorus.

3. Description of the Audit and Reporting Process

To ensure actions are undertaken to achieve the outcomes described in the 'management system' the actions shall be audited annually, by an independent body.

A description of the Audit Process shall include:

- The process for assessing performance against agreed actions and at an individual property level;
- The expectation and agreements around landowner and property record keeping for the audit purposes;
- An outline as to how the audit results will be fed back to Members and also shared with the wider community; and,
- How issues of poor performance to implement actions and reach outcomes are to be managed.

The summary audit report shall be submitted to the Canterbury Regional Council annually.