

**BEFORE THE CANTERBURY REGIONAL COUNCIL**

**IN THE MATTER OF**

The Resource Management Act 1991

**AND**

**IN THE MATTER OF**

applications by **KJ, DK & SR Anderson** filed under:

**CRC012019** for a water permit to divert, take and use water from the Otamatapaio River for the spray and border dyke irrigation of pasture and winter crop on Bog Roy Station; and

**CRC012033** for a discharge permit to discharge by-wash water and excess stockwater from an irrigation race into Lake Benmore

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**REPORT AND DECISION OF HEARING COMMISSIONERS PAUL ROGERS,  
MICHAEL BOWDEN, DR JAMES COOKE AND EDWARD ELLISON**

**PART B - SITE SPECIFIC DECISION**

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## 1 INTRODUCTION

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- 1.1 This is a decision on applications by **KJ, DK and SR Anderson** (the applicant). It is one of many decisions we have made on 104 applications by various applicants for water permits and associated consents in the Upper Waitaki Catchment.
- 1.2 The decision should be read in combination with our Part A decision, which sets out our findings and approach to various catchment wide issues that are common to multiple applications. References to our Part A decision are made throughout this decision as appropriate.

## 2 THE PROPOSAL

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- 2.1 The applicant proposes to divert and take water from the Otamatapaio River to irrigate an area of 105 hectares of crops and pasture within Bog Roy Station, and to provide stockwater for part of the property. This proposal is to replace consents for irrigation of the property that have recently expired, as discussed further below.
- 2.2 Water will be conveyed from the diversion point through an existing race system that crosses under State Highway 83 and runs through to Lake Benmore. Water will be diverted taken at a maximum rate of 100 litres per second (excluding stock water).
- 2.3 For the first five years of the consent, it is proposed that water will be used for irrigation using the existing border-dyke system on the property. During this time, the annual volume of water used for irrigation will not exceed 1,339,200 cubic metres per year (between 1 July and the following 30 June), plus 10% for race losses.
- 2.4 Five years after the commencement of the consent, it is proposed that the irrigation will be upgraded to a spray system. At this point, the maximum annual volume for irrigation will reduce to 765,373 cubic metres per year (between 1 July and the following 30 June), plus 10% for race losses.
- 2.5 In relation to annual volumes we note that different numbers were provided in the various reports and evidence received. The above numbers are based on the evidence of Ms Johnston, which we have taken to be an accurate record of what is sought. These annual volumes include water for irrigation, but exclude stock water which we are not considering as part of the proposal. We discuss the issue of stock water below under the heading "modifications after notification".
- 2.6 Any unused water diverted through the race system is proposed to be discharged into Lake Benmore at or about map reference NZMS 260 H40:801-224. The maximum rate of discharge will be 110 litres per second, 9,504 cubic metres per day, and 66,528 cubic metres per week.
- 2.7 The indicative location of the proposed activities is illustrated in **Figure 1** below.

### The applications

- 2.8 There are two separate applications that make up this proposal:
- (a) **CRC012019** for a water permit to divert, take and use surface water pursuant to section 14 of the RMA. Consent is required under the WCWARP as discussed below.
  - (b) **CRC012033** for the discharge of contaminants into the environment pursuant to section 15 of the RMA. Consent is required under the NRRP as discussed below.
- 2.9 Both applications were lodged with the Canterbury Regional Council (the Council) in 2001, with CRC012033 being lodged on 28 March and CRC012019 following on 20 June. The applications were publicly notified and there were a number of submissions that are referred to later in this decision. The applications are for replacement consents and requested a consent duration of 35 years.

### Modifications after notification

- 2.10 In addition to taking water for irrigation, the original application also sought to take for stock water supply. However, subsequent to notification the applicant advised that they were no longer seeking consent for stock water and were instead relying on their rights under section 14(3) of

the RMA (s92 response dated 5 December 2008). This was confirmed in the final set of conditions we received from the applicant where the reference to stock water was deleted from the description of the use.

- 2.11 On this basis, we have not considered the issue of stock water in this decision, other than as part of the discharge of excess water. Any discussion of appropriate take volumes relates to the water required for irrigation purposes and associated race losses. As discussed in our Part A decision, the applicant retains the ability to take water for stock and domestic use without the need for resource consent, subject to the limits in section 14(3) of the RMA.

### Related consents and applications

- 2.12 As mentioned above, these applications are seeking to replace consents WTK691232 and WTK691233, which expired on 1 October 2001. These consents authorised the taking of water from an unnamed tributary of the Otamatapaio River for stock and domestic water and irrigation at a rate of 110 L/s and a discharge of this amount into Lake Benmore. As the current applications were lodged 6 months prior to the expiry of the above consents, the applicant is currently operating under s124 of the RMA.
- 2.13 The applicant has not lodged any application to undertake works in the bed or banks of Otamatapaio River (s13) associated with the diversion structure as they consider that none is required for the existing structure. However, they note that the diversion structure may be upgraded in the future and at that time any required permits will be lodged.
- 2.14 There is one other user of water within the Otamatapaio River catchment seeking a replacement consent with higher priority (Otamatapaio Station 1993 Ltd – CRC012047) and one other applicant for a new consent with lower priority (Otematata Station Ltd – CRC041033).
- 2.15 In addition to these applications, the applicant (in association with adjacent landowners) has lodged further diversion and discharge permits, also as replacements, for irrigation of additional land within a different part of Bog Roy Station (CRC012017, CRC012032). We have issued a separate decision on these applications.



Figure 1- Indicative Location Plan

### **3 DESCRIPTION OF THE ENVIRONMENT**

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- 3.1 Bog Roy Station covers an area of approximately 2,860 hectares and lies between the Lake Benmore and the Hawkdun Range, northwest of Otematata. It comprises two connected blocks – one covers the western half of the steep dissected hills lying between SH 83 and Lake Benmore, the other covers the alluvial plain and a portion of low hills on the east side of the Otamatapaio River at the base of the Hawkdun Range.
- 3.2 The proposed irrigation area is a mixture of flat and gently sloping land at the base of Bog Roy Hills, and lies between the lakefront and SH83. Much of the irrigation area is visible to general traffic along SH83 and from users of Lake Benmore. Sailors Cutting camping ground, a well used recreational area, is located approximately 1.5 kilometres to the west of the irrigation area.
- 3.3 Otamatapaio River is a high country cobbled bed river which experiences ephemeral conditions below the point of diversion in the greater part of the summer. These conditions occur naturally and extend through to SH83.
- 3.4 Flow losses to streambed gravels between the proposed intake point and Lake Benmore occur when flows are less than 300 litres per second. However, in a natural state with no abstraction, the occurrence of flows less than 300 litres per second and subsequently a dry river bed would occur only 3% of the year.
- 3.5 Fish species identified in Corbies Creek, Otamatapaio River the water races and other small tributaries were predominantly brown trout, upland bully and common bully. These waterways provide suitable habitat for several invertebrate species. Otamatapaio River is an important spawning and juvenile rearing tributary of Lake Benmore for both brown and rainbow trout.
- 3.6 The Otamatapaio River, previously known as Maka tipua is of great significance to Māori, being pre-Mamoe. Before Lake Benmore, a temporary camp site was sited at the river mouth, and rock drawings from this period were lost due to the creation of the lake. We note that the Tipa & Associates' "Cultural Impact Assessment" (CIA) refers in section 4.10 on trails to a place named "Ma Ka Tūpuna" and, in brackets, to a stream at Robertson Saddle. The CIA refers to Ma Ka Tūpuna as one of a number of stopover sites for travellers heading inland to such places as Lake Hawea.
- 3.7 Total catchment area of the river is 184km<sup>2</sup>. The hydrology of the catchment is reasonably well understood with flow recording beginning in 1988.
- 3.8 Further description of the environment is provided in our Part A decision and our summary of the evidence received from the applicants and submitters below.
- 3.9 We detailed our site visits in Part A and we do not repeat this information here. We did not as a group conduct a site visit on the ground. However, we did fly over the site to familiarise ourselves with the area involved in the proposal.

### **4 PLANNING INSTRUMENTS**

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- 4.1 As discussed in our Part A decision, there is a wide range of planning instruments that are relevant under the RMA. This includes national and regional policy documents, along with regional and district plans. The key planning instruments relevant to these applications are as follows:
- (a) Waitaki Catchment Water Allocation Plan (WCWARP);
  - (b) Natural Resources Regional Plan (NRRP);
  - (c) Proposed and Operative Canterbury Regional Policy Statement (CRPS); and
  - (d) Waitaki District Plan (WDP)
- 4.2 The provisions of these planning instruments critically inform our overall assessment of the applications under s104(1)(b) of the RMA, as discussed in Section 14 of this decision. In addition, the rules within the relevant planning instruments determine the status of the activities, as set out below.

## Status of the activity

4.3 In our Part A decision we provide a detailed discussion of our approach to determining the status of activities. We now apply that approach to the current applications.

### CRC012019 – Divert, take and use water (s14)

4.4 This application is listed in Schedule 2 of the Resource Management (Waitaki Catchment) Amendment Act 2004. Section 88A therefore does not apply and the relevant plan for this activity is the operative WCWARP.

4.5 The following rules from the WCWARP are applicable to this application:

- (a) Rule 2, clause (1) – The applicant proposes the minimum flow of the 5-year 7- day low flow of 200 litres per second in the Otamatapaio River at the Footbridge (Table 3, row (xxii)) A minimum flow on Corbies Creek is not proposed given the proximity of the confluence with the Otamatapaio River downstream and the history of gaugings available on the Otamatapaio River. This minimum flow location is above all abstractions in the catchment.
- (b) Rule 6 – The activity is within the allocation limit of 275 million cubic metres for agricultural activities upstream of Waitaki Dam
- (c) Rule 15 - Classifying rule – discretionary activity

4.6 Based on the above, the divert, take, and use of water is a **discretionary activity** under Rule 15 of the WCWARP.

### CRC012032 – Discharge water (s15)

4.7 This application is listed in Schedule 2 of the Resource Management (Waitaki Catchment) Amendment Act 2004. Section 88A of the RMA therefore does not apply and the relevant plan for determining the status of this activity is the operative NRRP.

4.8 The relevant provisions of the NRRP are as follows:

- (a) Rule WQL1 – permits the discharge of water into a river, subject to compliance with a range of conditions
- (b) Rule WQL48 – provides for the status of a discharge to water where it fails to comply with any of the conditions in WQL1. Will be classified as either a discretionary or non complying activity, depending on whether it complies with the listed conditions.

4.9 The discharge is unlikely to meet conditions 1 and 3 of Rule WQL1; therefore the activity is classified under Rule WQL48. The activity is likely to comply with the conditions of that rule; therefore, the discharge is classified as a **discretionary** activity.

### Overall status of the proposal

4.10 Based on the above, we have assessed the entire proposal as a **discretionary activity**.

## **5 NOTIFICATION AND SUBMISSIONS**

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5.1 Both applications were notified in July 2003. They were subject to the December 2003 “ministerial call-in” and re-notified in August 2007 with 200 other applications for similar activities in the Waitaki catchment.

5.2 In the 2007 public notification, 16 submissions in total were made on the take and use application (CRC012019). Of these 2 were in support, 12 in opposition, and 2 neither supported nor opposed this application. In the July 2003 notification, a total of 13 submissions were received with 4 in support and 9 in opposition. In the December 2003 “ministerial call-in”, a total of 314 submissions were received on these applications.

- 5.3 None of the submissions made any reference to the discharge applications or the effects of the proposed discharge.
- 5.4 Table 1 is based on the relevant s42A reports and summarises those submissions that directly referenced the take and use application. In addition to those listed, there were other submitters that presented evidence at the hearing that was relevant to this application. The relevant evidence from submitters is discussed in more detail later in this decision. Please note that all submissions hold equal importance, even if not specifically listed below.

**Table 1.** Summary of submissions on application CRC012019

Submitter	Reasons	Position
Otamatapaio Station 1993 Ltd <sup>1,3</sup>	Need to have flow sharing arrangement when river gets low	Oppose
Fish & Game NZ <sup>1, 2, 3</sup>	Important fish spawning tributary and abstraction may be affecting continuous flows to Lake Benmore	Oppose
Meridian Energy Ltd <sup>1, 2, 3</sup>	Concerned about water quality, metering, and reasonable use	Support
D Saunders <sup>2</sup>	Supports taking of water from lakes and Waitaki River itself but not from smaller rivers/streams ( <i>IO comment: from the submission itself it would appear that this submission may have been made on this application in error as this application seeks to take water from a smaller stream, whilst the submission opposes takes from smaller streams</i> )	Support
Department of Conservation <sup>1, 2, 3</sup>	Potential effects on instream ecosystems given high cumulative rate of take from catchment	Oppose
CJ Munro <sup>3</sup>	Water needed to stockwater and winter feed crops	Support
Grays Hill Station <sup>3</sup>	Irrigation is sustainable use of water	Support
Waitaki River Users Liaison Group <sup>3</sup>	No catchment water allocation plan, over abstraction, inefficient use, consent duration and fish screening	Oppose
Haldon Station <sup>3</sup>	Catchment water allocation and cumulative effects of abstraction on Meridian and other water users	Oppose
A Campbell <sup>3</sup>	Reduction in flow of small streams, duration – suggest 5 years, would support water harvesting	Oppose
I Anderson <sup>3</sup>	Water is needed for economic survival of property	Support
Waimate Rod & Gun Club <sup>3</sup>	River is used to support trout fishery before irrigation abstractions, fish screens, oppose border-dyke irrigation	Oppose
NZ Salmon Anglers Assn <sup>3</sup>	Use for irrigation has caused river to go dry and affect angling opportunities and spawning	Oppose
Te Runangā o Waihao and Ngāi Tahu <sup>1,2,3</sup>	Cultural significance of area to Ngāi Tahu Whānui	Oppose

1 - August 2007

2 - Call-in 2003

3 - July 2003

- 5.5 Overall, the key effects of concern to submitters include effects on ecosystems, water quality, allocations, minimum flows, natural character and landscape, efficiency, and cultural values.

## 6 THE SECTION 42A REPORTS

- 6.1 Two section 42A reports were prepared on these applications by the Council's Consent Investigating Officer, Ms Clare Penman. One related to the water permit (Report 6B) and the other related to the discharge permit (Report 6C).
- 6.2 These primary reports was supported by a number of specialist s42A reports prepared by Messrs Heller, Hanson, Glasson, McNae and Stewart, and Drs Clothier, Schallenberg, Meredith and Freeman. The key issues addressed by these reports were cumulative water quality effects, landscape effects, and environmental flow and level regimes.
- 6.3 The reports were pre-circulated in advance of the hearing. Specific points noted from the s42A reports are summarised below.

- 6.4 In her s42A report on the water permit (CRC012019) Ms Penman supported the water management restrictions for all takes from the Otamatapaio River including those from Corbies and Glen Bouie streams proposed by Mr Boraman, Mr Stewart and Mr Scarf.
- 6.5 Matters that were identified by Ms Penman as outstanding and needed to be addressed at the hearing included the following:
- (a) Water quality – There was no impact assessment or measures to address the water quality impacts that could arise from irrigation at this site. Given the conclusion regarding the potential cumulative adverse effects on water quality, it was premature to make any recommendation to grant or refuse this application as it relates to cumulative water quality.
  - (b) Efficient & reasonable use – There was a lack of conclusive information to support the annual volume requested in accordance with the directions provided by Policies 15-20 of the WCWARP.
  - (c) Ecosystems – The applicant proposed a fish screen but had not included any details of what this would entail, and flow sharing had not been proposed.
  - (d) Cultural values – The applicant had not provided any assessment on cultural values.
  - (e) Other users – An appropriate flow sharing regime needed to be established and agreed on.
- 6.6 In his report, Mr Chris Glasson places the Bog Roy site and the Otematata Station along with Rostreiver within his Landscape Unit 8, which he calls "Aviemore".
- 6.7 He noted that the common characteristics of all takes in the Aviemore Landscape Unit were that all sites were small with discrete locations generally on fans or flats of existing modified landscape and located between SH83 and/or lakes and streams. All of the sites, due to the proximity to the roads, lakes and streams, were visible. At the time of the applications Mr Glasson noted that no mitigation measures were proposed. He was of the view that if mitigation measures were proposed such as creating a 50 m buffer to the lakes and streams and SH83, then the adverse effects would be less than minor.
- 6.8 Overall, it was his view that without the mitigation measures he proposed there would be moderate to minor adverse cumulative effects within this Aviemore Landscape Unit.
- 6.9 In Ms Penman's report on the discharge application, Ms Penman considered that there were no outstanding adverse effects of the discharge that had not been addressed through appropriate mitigation measures and that the effects of the proposed discharge were minor.

## **7 THE APPLICANT'S CASE**

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- 7.1 Legal counsel for the applicant, Mr Ewan Chapman, presented opening submissions and called four witnesses as follows:
- (a) Mr David Anderson - Applicant
  - (b) Mr David Boraman – Hydrologist
  - (c) Ms Keri Johnston – Chartered Engineer
  - (d) Mr Andrew Craig – Landscape architect

### **Opening submissions**

- 7.2 The applicant is part of the Upper Waitaki Applicant Group (UWAG), as described in our Part A decision. Mr Ewan Chapman presented comprehensive opening legal submissions on behalf of all UWAG applicants. He said that there may be matters of a specific legal nature relating to certain applications and those issues will be raised when the specifics of the applications were discussed in closing.



- 7.3 Mr Chapman told us that UWAG represents some 72% of all applicants for water takes. This equates to 31% of the total water volume applied for (excluding stock water and non-consumptive diverts) and 29% of the total irrigable area.
- 7.4 He also told us renewal consents applied for by the UWAG members represent some 88% of all renewal applications. For these renewal applications, Mr Chapman emphasised that they need not rely on modelled scenarios undertaken in the WQS. He contended their effects were known and form part of the existing environment. Thus he said we would need to evaluate these applications in a different scientific context than new irrigation development.
- 7.5 Mr Chapman emphasised that despite the collective approach adopted for these hearings, each application needs to be considered in isolation from others (allowing for priorities). However Mr Chapman noted that UWAG is not producing any other evidence to support its own assessments of cumulative effects and adopts the MWRL evidence to the extent that it defines nodal thresholds.
- 7.6 While raising some challenge to the outcomes of the mitigation measures proposed by MWRL resulting from the WQS study, Mr Chapman told us that the UWAG members were not presenting their case to say that they cannot or will not meet an area-based NDA threshold. To the contrary, he said that we would be shown that they have taken the model and applied it to all properties and will, with mitigation, meet the thresholds.
- 7.7 Mr Chapman then addressed us on the issue of allocation of assimilative capacity. Relevantly, for this application in terms of the Ahuriri, he told us the assimilative capacity is exceeded. He contended the approach taken by MWRL that essentially resulted in some farming units mitigating for the nutrient loss of other farming units, was inappropriate. He submitted a more appropriate method of allocation is on the basis of productive use of land. The productive use of the land he said represents the level of nutrient discharge of each farming unit and that should be used; and that the method of allocation based on dividing allocation on a per hectare basis should not be utilised.
- 7.8 He submitted that by assessing allocation of assimilative capacity on the basis of productive land use to reflect the NDA for each unit, these methods would be more representative and realistic of the nutrient discharge of each farming unit.
- 7.9 In terms of conditions concerning the nodal approach, he told us the essential issue lies with pinpointing who is exceeding their NDA if exceedances are detected at the nodal point. He told us the UWAG applicants' preference is for on-farm management of total nutrient discharge and annual auditing of individual FEMPs. He then referred us to a draft condition from the Rakaia Selwyn groundwater zone hearing, noting it was a very much site-specific condition.
- 7.10 He submitted that on-farm monitoring should be favoured over monitoring at nodal points. He said this did bring in the practicalities of the purpose of employing the FEMP with the result that if a breach of the FEMP occurs, the consent authority would have control to enforce the conditions of the consent against the individual applicant. It also reflects the reality that each farm will be different depending on the type of activity that is undertaken on that farm with their own tailored farming management practices.
- 7.11 Mr Chapman also said that UWAG had not tabled a final set of conditions or final farm management plans. These matters would be worked through and provided to all parties as the hearing progressed. UWAG was of the view that one suite of conditions was inappropriate. There were variables between sub-catchments, take points, and the "type" of consent applied for which would mean that individual conditions would need to be worked through.

#### **Mr Anderson**

- 7.12 Mr David Anderson told us he lives at Bog Roy Station. He noted he was the fourth generation of Andersons farming Bog Roy.
- 7.13 He told us that Bog Roy Station shares its property boundary with Lake Benmore, being in close proximity to the Benmore Dam. He noted the farm originally included silt flats, which were flooded when Lake Benmore was raised in the 1960s.
- 7.14 Mr Anderson noted that the climate in the district was extreme, ranging from harsh dry summers to sub-zero temperatures in the winter. He told us about drought conditions and the difficulty they caused; thus the importance of irrigation. He also told us that irrigation ensures against the

volatility of the store market. Mr Anderson told us that irrigable land provides the stability to the overall farm. It is, as he said, the heart of the farm. It compensates for harsh weather conditions and allows farming to occur through dry years.

- 7.15 He did contrast the water takes for Bog Roy with others, noting that the irrigable area of Bog Roy covers less than 5% of the total property and compared to some other properties seeking irrigation water, it was very small. He was concerned to see that Bog Roy was included within the Ahuriri Node for assessment purposes. He was concerned that his activities may be affected by what he described as "discharges from corporate dairying operations" because all applicants may need to take responsibility for deterioration of water quality at certain nodes. He found this outcome to be unacceptable. He was of the view that these very large applications before us at the hearing should be treated as almost totally separate from irrigation being used for purposes such as his own, which is on a smaller scale and is used as an integral part of the property to strive for future viability.

#### **Mr Boraman**

- 7.16 Boraman Consultants Limited was engaged to investigate the hydrology and check the validity of the statistics of Otamatapaio River proposed by Environment Canterbury. Mr Boraman said that investigations were undertaken into the hydrology of the Otamatapaio River and had been added to existing data collected previously by Waitaki Catchment Commission, Canterbury Regional Council, and Environmental Consultancy Services.

#### Otamatapaio River

- 7.17 Mr Boraman said that the Otamatapaio River was located on the southern shores of the Ahuriri Arm of Lake Benmore, approximately half way between Otematata and Omārama. The Otamatapaio River drains directly into the southern side of the Ahuriri arm of Lake Benmore.
- 7.18 Mr Boraman said that the Otamatapaio River had a catchment area above SH83 of 185 km<sup>2</sup>. The catchment altitude ranges from 360m up to 1850m, the upper catchment had snow on the shady faces for much of the winter months.
- 7.19 Large rainfall events in the catchment generally come from the easterly quarter; in winter, this may fall as snow in the upper catchment. Occasional large westerlies may provide rainfall, but not usually in large quantities.
- 7.20 Mr Boraman then described the hydrology of the Otamatapaio River. He said that the Otamatapaio River had significant losses in its system and was often dry below the Corbies Creek confluence. Although the WCWARP states the minimum flow should be set at the lower end of the catchment, because the lower reach was ephemeral, and historical measurements were carried out at the footbridge at which there was a significant flow record, it was decided that the gorged area was the most practical for a minimum flow site. The site would act as a trigger site for the entire Otamatapaio / Corbies Creek Catchment.
- 7.21 Mr Boraman said that the Otamatapaio River was monitored regularly over the summer months from 1971 to 1978 with 33 gaugings carried out by the Waitaki Catchment commission. In 2001 and 2003 a series of profile gaugings were done down the Otamatapaio River by Environmental Consultancy Services with another three measurements to add to the dataset.
- 7.22 A staff gauge and a Trustrack automatic water level recorder were installed on 26 September 2007. This provided continuous water level readings every 15 minutes. The site was on the abutment of the old footbridge access track at map reference NZMS260 H40:759-168. During the period of operation there have been a total of 10 flow measurements made. All flow measurements plotting within the accepted 8% of the derived flow rating curve. The site proved to be stable, with only one rating change during the period of operation.

#### **Ms Johnston**

- 7.23 Ms Johnston explained that the applicant sought the renewal of existing use rights WTK691232 and WTK691233, which authorise the taking of water from an unnamed tributary of the Otamatapaio River at a rate of 110 L/s and a discharge of this amount into Lake Benmore.
- 7.24 She said that currently irrigation is border dyke, however, the applicant realised that with a greater emphasis on irrigation efficiency, the current irrigation system will need to be up-graded to a spray system and proposed to do this over a 5 year period. This included the intake

structure, which currently consists of a concrete opening into a race, with flow controlled by opening and closing a gate.

- 7.25 Irrigation on Bog Roy has occurred since the 1960s Ms Johnston said, and prior to this, the race system now used to convey irrigation water around the property was used to supply stockwater. The applicant's grandfather constructed the race system and it is thought to have been put in place in the early 1950s.

### **Water Source**

- 7.26 Ms Johnston said that the Otamatapaio River drained the Hawkdun and St Cuthbert Range, directly into the southern side of the Ahuriri Arm of Lake Benmore at Sailors Cutting. The Otamatapaio River has a catchment area above SH83 of 185 km<sup>2</sup>
- 7.27 The catchment altitude ranges from 360m up to 1850m, and the upper catchment has snow on the shady faces for much of the winter months and therefore low flows in the catchment are usually experienced in winter.
- 7.28 The Otamatapaio supports fisheries common to high country rivers. These include common and upland bullies, common river galaxies, rainbow and more predominantly brown trout.

### Effects on other water users

- 7.29 Ms Johnston emphasized that this was the renewal of an existing water right. No increase in rate or weekly volume (as currently authorised) was being sought, and the applicant proposed a minimum flow in accordance with Table 3 of the WCWARP. A Memorandum of Understanding, including a flow sharing regime has been signed by all water users in the catchment.
- 7.30 Other users in the catchment include Otamatapaio Station, Otematata Station and Rostriever Station who seek to renew water resource consent to take and use 110 L/s from Corbies Creek, a tributary of the Otamatapaio River (CRC012017), for irrigation and stockwater
- 7.31 Otematata Station also seeks consent to take water from the Glen Bouie Stream which is a tributary of Corbies Creek.
- 7.32 Ms Johnston said that considerable work has gone into improving relations between the Otamatapaio River water users. All water users had now agreed to work together to manage the Otamatapaio River flows in the range of 450 L/s to 200 L/s (the range when reductions would need to be implemented to maintain flows above the minimum flow for as long as possible). This was formalised with a Memorandum of Understanding (MOU) which had been signed off by all Otamatapaio River abstractors.
- 7.33 A telemetered water level recorder would be installed at the minimum flow site to allow the group to manage the flow sharing.
- 7.34 Mitigation was proposed restricting the rate of take and volume per week, and commitment to the establishment of a flow sharing committee. In Ms Johnston's view effects on other users would be minor.

### **Effects on ecosystems**

#### Minimum flow requirements

- 7.35 Ms Johnston said that the applicant proposed the minimum flow required under the WCWARP for the Otamatapaio River which for "all other rivers and streams" is the 1 in 5-year, 7-day low-flow. Ms Johnston understood that the minimum flow was specified in the WCWARP to ensure that the aquatic values of the stream are protected. The minimum flow had also been agreed with the Canterbury Regional Council and Fish and Game and from verbal communications with the Department of Conservation, it was understood that they also accept this minimum flow.
- 7.36 The minimum flow determined was 200 L/s at the Foot Bridge on the Otamatapaio River. The Foot Bridge is located upstream of all abstractions.
- 7.37 Ms Johnston said that at present the applicant used a surface intake structure to take water and the current intake would not allow an easy "retro-fit" of a fish screen. A separate structure would need to be installed in the race immediately downstream of the intake, at a cost of between

\$3000 and \$5000. The new intake will be designed to incorporate a fish screen that meets the requirements of the NIWA Report.

- 7.38 This had been proposed as a condition of consent and had been agreed to by Fish and Game and the Department of Conservation (by e-mail dated 24 August 2009).
- 7.39 Ms Johnston said that Policy 28 of the WCWARP provided for recognition of the value of investment when an application for replacement is considered, and also whether all reasonable attempts have been made to meet the efficiency expectation of the plan. It is because of the efficiency expectations that the applicant has made a commitment to up-grade their intake and irrigation system, but financially, this could not happen straight away. However, the applicant had proposed a five year time frame, which Ms Johnston considered to be reasonable, to allow the upgrade to occur, with full support from Fish and Game and the Department of Conservation.
- 7.40 Ms Johnston also noted that this is an existing activity, and the continuation of abstraction in its current form will not cause any change in existing effects, and that the proposed over five years will enable the best system to be installed, and have positive results.
- 7.41 Again Ms Johnston considered effects on in-stream values to be minor.

### **Effects of inefficient water use**

- 7.42 Ms Johnston said that the proposed irrigation annual volume for the current system is based on its design system capacity of 1500mm/ha/year, for a 155 day irrigation season. The proposed irrigation annual volume for the spray system (5 year upgrade) is based on Irricalc. She said the initial annual volume of 1,339,200 m<sup>3</sup>/year would reduce to 765,373 m<sup>3</sup>/year after 5 years (excluding race losses).
- 7.43 Policy 16 of WCWARP requires all applications for irrigation to meet a reasonable use test in relation to the instantaneous rate of take and the annual volume, including consideration of irrigation system operation and management (Policy 16(a)), and an irrigation application efficiency of at least 80% (Policy 16(b)).
- 7.44 Ms Johnston's understanding was that border dyke irrigation was capable of achieving between 50% and 90% efficiency. Centre pivots, for comparison, should be capable of achieving between 70% and 90% efficiency. She said that the applicant's border dyke system has been in place for many years, and utilises available fall to gravity feed the system. However, there were efficiency gains to be made, and the applicant acknowledges this.
- 7.45 Ms Johnston then explained that there were two areas where irrigation efficiency could be improved. The first was "how evenly water is being distributed" and the second was "how well the system is managed" (are the taps turned on and off at the right time).
- 7.46 With the border dyke system in the meantime, she said it was not easy to change how evenly the water is distributed, but irrigation management techniques can be implemented straight away. The applicant also proposed to install a soil moisture measurement system within all irrigated areas to ensure that irrigation only occurs when it was needed.
- 7.47 Furthermore, Ms Johnston said that the applicant had made a commitment to ensuring efficient irrigation practices and proposed to phase out border dyke irrigation on areas where a spray system could easily be installed (on the flat land adjacent to the lake). This was where the largest efficiency gains could be made.
- 7.48 Ms Johnston said that the proposed conditions acknowledged that the applicant already had an irrigation system, and policy 28 of the WCWARP recognised the value of investment of the existing consent holder, and this had to be given consideration, however, policy 28 also required a consent holder to take all reasonable attempts to meet the efficiency expectations of the plan, and the applicant was doing this by committing to a 5 year plan to upgrade the system, therefore, reducing the volume of water needed.
- 7.49 Policy 16 (c) of the WCWARP defines two alternative approaches for determining appropriate annual volumes for irrigation. The first method described is a soil water balance approach, and the second is more commonly referred to as Schedule WQN9v2. Irricalc is a soil water balance approach developed by Aqualinc Research Ltd.

- 7.50 Policy 19 of the WCWARP encourages the piping or otherwise sealing of water distribution systems to minimise water losses. Ms Johnston said that the applicant considers that 10% conveyance loss is very small and this is partly due to the fact that the race system has been in existence since the early 1950s and has sealed over time, but it is a long network, and losses are still experienced.
- 7.51 Policy 21 of the WCWARP requires all water takes to be metered. To ensure that this application is consistent with this policy, the applicant proposes to meter their take. Therefore Ms Johnston considered the effects of inefficient water use would be minor.

#### **Effects of the use of water on water quality**

- 7.52 Ms Johnston said that cumulative effects on water quality have been addressed by Mackenzie Water Resources Limited (MWRL) and were summarized below.
- 7.53 The calculated nutrient mitigation requirement of the receiving environments determined in the MWRL Study had identified an N and P threshold for each property.
- 7.54 OVERSEER® has been run by a qualified person to model the N and P outputs from the proposed farming system, which showed that the applicant could meet the property thresholds (NDA) proposed by the MWRL study. We return to the OVERSEER modelling as updated in the final FEMP in our evaluation of effects
- 7.55 The applicant was committed to implementing the "Mandatory Good Agricultural Practices" set out within the FEMP. Implementing these practices in Ms Johnston view ensure that the OVERSEER® results were validated. This along with ensuring that the property thresholds of the WQS were not exceeded would ensure that the cumulative effects of the use of water for irrigation on water quality are no more than minor.
- 7.56 Whilst the applicant is within their property thresholds, the MWRL Study identified that the applicant still had to consider specific on farm effects and the impacts these activities could have on the local receiving environment. This required a specifically developed Farm Environmental Management Plan (FEMP) to identify and implement appropriate mitigation measures set out in the draft.
- 7.57 At a workshop held in Twizel in August 2009, the applicants met with Dr Melissa Robson of GHD Limited. A "desk top" on farm risk assessment was undertaken.
- 7.58 The workshop identified potential on farm risks specific to each farm along with possible mitigation measures. The on farm risks identified during the desktop risk assessment would need to be verified by an appropriately qualified person. For this property, the following potential risks were identified:
- (a) Evidence of erosion
  - (b) Runoff from winter feed crops
  - (c) Laybacks from waterways from fertiliser application
  - (d) Timing of P fertiliser on border dykes
  - (e) Track runoff - check
  - (f) The Otamatapaio River
  - (g) Tailgate water from border-dykes until conversion to spray is completed
  - (h) Fencing off water races
- 7.59 Ms Johnston said that the applicant has committed to carrying out a full on farm risk assessment, proposing mitigation, monitoring and auditing would occur within 12 months of the commencement of the consents (as these applications seek renewal of existing activities), and this has been proposed as conditions of consent.
- 7.60 We note that the final FEMP was tabled with ECan on 22 November 2010, and we use this FEMP as our starting point for evaluating potential effects (section 12).

- 7.61 Ms Johnston said that the N and P thresholds from the MWRL Study could be met; the applicant was committed to addressing on farm risks with the implementation of the FEMP, therefore the effects of the use of water on water quality for both the local receiving environment and cumulative effects she considered to be minor.

### **Landscape**

- 7.62 Ms Johnston said that Bog Roy has a "visible" irrigation area between SH83 and Lake Benmore, but irrigation has been occurring on this property since the 1960s. The property was part of an already substantially modified rural environment, whereby cultivation and fencing occur regularly, and where power lines and many buildings exist and are highly visible also. Ms Johnston said that Mr Andrew Craig (a landscape architect) who is providing general and specific recommendations on behalf of UWAG would address landscape effects.

### **People, communities and recreational values**

- 7.63 Ms Johnston said that the applicant had proposed an appropriate minimum flow condition in accordance with the WCWARP for the water body from which they have applied to take and use water. The minimum flow was considered to adequately protect people, community and amenity values within the rivers specific to each applicant.
- 7.64 The applicant's commitment to ensuring efficient use of water on their properties, and that the take is within allocation limits set to protect in-stream values and other users, would in Ms Johnston's view ensure that effects on people and communities were minor.

### **Effects on Tangata Whenua Values**

- 7.65 Te Runangā O Ngāi Tahu submitted on all applications in the catchment, seeking that all applications be declined. Ms Johnston understood that the primary reasons for this were that the applications were considered to be inconsistent with the policies and objectives of the WCWARP, and also at odds with the cultural objectives of the RMA.
- 7.66 Ms Johnston pointed out that this application was entirely within the limits defined by the WCWARP and Te Runangā O Ngāi Tahu had considerable input into the creation of the WCWARP. However, she acknowledged that Te Runangā O Ngāi Tahu have a significant relationship with the Waitaki Catchment, and as such, appropriate minimum flow conditions, and management of water quality effects, is proposed by the applicant to ensure that the potential effects on the environment, including tangata whenua values are minor.

### **Effects of discharge**

#### **Effects on flood carrying capacity and erosion**

- 7.67 Lake Benmore is a large, well established waterbody. Ms Johnston also noted that the discharge had been occurring since the early 1950s and there was no evidence of any erosion having occurred. Ms Johnston expected the effects on flood carrying capacity and erosion would continue to be minor.

#### **Effects on water quality and ecosystems**

- 7.68 Ms Johnston said that the water discharged into Lake Benmore was excess water that was diverted as well as irrigation by-wash water from the border dyke system. The discharge may contain some contaminants, but Lake Benmore was a large body of water relative to the discharge.
- 7.69 She also said that the discharge be addressed through the FEMP process, and had been identified already as a farm specific risk. Ms Johnston view was that the effects on water quality and ecosystems would continue to be minor.

#### **Effects on other water users and amenity values**

- 7.70 When water is discharged there is the potential to cause adverse effects on other users of the water body due to the contamination of the water, or create an unsightly plume that may affect amenity.
- 7.71 Ms Johnston said that in this case, the receiving water body was Lake Benmore. The volume

discharged was a very small volume of water in proportion to the volume of water in the lake; therefore effects on other users and amenity values would be minor.

### **Andrew Craig**

- 7.72 Andrew Craig, a landscape architect of significant experience, provided his assessment of landscape effects in relation to application CRC012019. He also critiqued Mr Chris Glasson's section 42A Report prepared in respect of this application.
- 7.73 In general, he noted that the mountainous surround display high natural character in that they are not modified to any great extent. However, on the other hand, it was his view that the valley floor was modified as a consequence of the prevalent farming activity within. It was his view that this modified character was evident on both sides of the state highway and for Bog Roy and/or the Anderson site, extended down to the lake shore.
- 7.74 In his assessment Mr Craig noted that the existing border dyke irrigation system contributes to the modified character of the pastoral farming scene.
- 7.75 It was his view that overall the application site and its surrounds were complex and busy environments compared to the more natural character of the wider setting. It was his view that the application site displayed all of the typical attributes of a working farming landscape, including that of land currently irrigated.
- 7.76 Mr Craig agreed that the site was modified due to normal farming activity and the presence of infrastructure. He was of the view that given the consent sought involves a replacement activity; the application site is already cultivated, where improved pasture is evident, including from the state highway. Mr Craig was clear that in his view there was certainly no need for a buffer alongside the highway as the landscape was already cultivated and in pasture right up to the road boundary. Being a replacement consent, he said there would be no significant change to the visual character and amenity of the site as seen from the road.
- 7.77 According to Mr Craig the application site does not appear to adjoin Lake Benmore and it looks to be at least 200 m from it. A buffer strip between the lake and application site is therefore not needed he said, given that a de facto strip exists. Vegetation within this strip comprises mostly lakeside willows, which will not be affected by the irrigation replacement, as is the situation to date.
- 7.78 Mr Craig also noted that future irrigation will involve spray units, which are likely to be K-lines or guns given the narrow confines of the application site and presence of obstacles such as trees and buildings. He noted that these structures are visually low-profile and would not therefore intrude into important views.
- 7.79 Mr Craig went on to note there appears to be no submissions concerning landscape effects that identify the Anderson application and Bog Roy causing any issues.

## **8 SUBMITTERS**

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- 8.1 Set out below is the summary of the issues raised by submitters who appeared before us. We emphasise that we have read and considered all submissions made, both in support and in opposition to the application, as well as reviewing and carefully considering evidence advanced before us.

### **Fish & Game**

- 8.2 Mr Frank Scarf (Hydrologist - Fish and Game) supported this management regime for the applications proposed by Ms Penman in her report (as earlier discussed). Under these conditions, all consents would be reduced to half their consented take when flow at the Footbridge fell below 400 L/s.
- 8.3 Concurrent gaugings work carried out by Fish and Game indicated that between the Corbies confluence and SH 83 there was a loss of about 200 L/s. The minimum flow regime proposed would ensure that some flow in this section was retained for much of the time so enabling fish passage from Lake Benmore to the upper reaches of Corbies Stream.

### **Meridian Energy Ltd**

- 8.1 Mr Richard Turner, Planning Manager – Natural Resources, Meridian Energy Ltd, tabled a list of consent applications which were of a concern to MEL from a cumulative water quality perspective based on the sub-catchments in which the properties were located relevant to Meridian's operations and areas of interest.
- 8.2 The Meridian Energy approach was adopted for two reasons:
- (a) the potential environmental effects and impacts on hydro-energy generation operations from intake blockages from macrophyte and periphyton growths and the associated increases in operating and maintenance costs and generating efficiency.
  - (b) The lack of any cumulative or comprehensive water quality assessment in the resource consent applications that were notified, making it difficult to consider the actual and potential adverse effects of the applications on the operation of the Waitaki Power Scheme.
- 8.3 The current applications were included in the Meridian Energy Ltd list of consent applications of concern. The principle concern in respect of the sub-catchment concern was in quantifying the nutrient thresholds to ensure that a TLI in Lake Benmore did not exceed 2.75, based on a summer average.

#### **Mackenzie Guardians – Ms Di Lucas**

- 8.4 Ms Di Lucas on behalf of Mackenzie Guardians provided us with a broad ranging brief of evidence, much of which we have already commented upon in Part A.
- 8.5 In terms of this particular "take" application, she identified it as being within her Ahuriri System. Within her written evidence the application did not receive any attention. In her graphic materials she identified the site as Site #42.
- 8.6 Quite possibly because it is categorised in her evidence as an existing activity, she did not give it any great attention. Nevertheless, we adopted the standpoint that Mackenzie Guardians were opposed to this grant.
- 8.7 We note when Ms Lucas undertook the analysis contained within her attachments, the site did not "register" as a geo-preservation site but nor did it register as a site with significant inherent values, nor did it have a high natural landscape rating. We noted from her Attachment 16, she had identified the site as being with an existing cultivated area.

#### **Mackenzie Guardians – Dr Susan Walker (ecologist)**

- 8.8 We note that Dr Walker gave comprehensive evidence on the cumulative effects of irrigation on vegetation on the Mackenzie Basin. This evidence is discussed in Part A. Her evidence being Basin-wide included that a more in-depth investigation of the individual sites was required. However, she did loosely provide us with Attachment 15, which contained her more particularised reviews in respect of each site.
- 8.9 In terms of her assessment as per Attachment 15, Dr Walker assessed Bog Roy Station as a whole as being approximately 33% converted. She considered that the potential effects of irrigation on terrestrial biodiversity were moderate.

#### **Tangata Whenua**

- 8.10 Mr Horgan told us that Ngāi Tahu had taken a balanced approach when assessing the applications and resisted the temptation to simply oppose all applications in their entirety. More particularly, Ngāi Tahu has generally placed its emphasis upon the new (rather than replacement) consent applications and those that will result in large scale land use intensification, rather than the taking of water so as to provide security of supply for existing farming operations.
- 8.11 Mr Horgan told us that Ngāi Tahu had adopted two focal points against which they assessed the applications. The Ahuriri Delta was one of these as it would be one of the most acute receiving environments for the discharge of nutrients from the irrigation proposals. He told us it was also an area where Ngāi Tahu proposes to undertake mahinga kai restoration.



- 8.12 Mr Horgan told us that provided the smaller applicants carry out appropriate riparian planting and fencing and undertake not to significantly increase the intensity of their farming operations, then Ngāi Tahu were not opposed to the granting of consent.

Ms Mandy Waaka-Homes (Ngāi Tahu)

- 8.13 Ms Waaka-Homes told us she had inherited the role of a kaitiaki to the Upper Waitaki system. She told us her focus was on the new and large scale irrigation proposals involving dairying and the effect this would have on the surrounding waters especially the Ahuriri Delta. She told us that the cultural health of the Ahuriri Delta was already under significant strain.

Ngāi Tahu-Mamoe Fisher People

- 8.14 Submissions were received in opposition to this application from Ngāi Tahu-Mamoe Fisher People. The concerns of the Ngāi Tahu Mamoe Fisher People seem to relate specifically to the resource consent process, rather than this specific application.

**9 UPDATES TO THE SECTION 42A REPORTS**

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**CRC012019**

- 9.1 Ms Penman said that a draft FEMP was included with Ms Johnston's evidence.
- 9.2 Ms Penman noted that in relation to the OVERSEER input parameters used by the applicant:
- (a) Total irrigation area of 228ha, but only 165ha applied for under these applications (CRC012019 and Bog Roy portion of CRC012017).
  - (b) 600mm irrigation application depth used, but 728mm applied for under this application once converted to spray (1275mm for first 5 years under border-dyke).
- 9.3 A flow sharing regime for all users in the Otamatapaio River catchment was proposed by Mr Boraman. Ms Penman said she was satisfied with the proposal.
- 9.4 Ms Johnston noted that the proposal was to include a fish screen in the race downstream of the intake, and that has been agreed to by DoC and Fish & Game via email. This was reflected in the proposed conditions which provides for the fish screen to be installed within 5 years. Ms Penman was satisfied with this amendment.
- 9.5 In the table at section 4.3 of her evidence, Ms Johnston proposed an annual volume (excluding stockwater) of 1,504,656m<sup>3</sup> per year, reducing to 915,790m<sup>3</sup> after 5 years due to a conversion to spray irrigation. The reduced volume was determined using Irricalc. However, Ms Penman said that it was based on border-dyke assuming 70% efficiency and 14 day return periods. Policy 16(b) requires an irrigation efficiency of 80%.
- 9.6 Ms Penman said that she was not satisfied that the proposed annual volume for CRC012019 adequately considers the matters outlined in Policy 16(b), and unless an efficiency of 80% was used, efficient and reasonable use remains an outstanding concern. Should the 80% efficiency be addressed, provided a favourable comparison of the Irricalc input parameters against field measurements is undertaken prior to granting of consent, she would be satisfied that the proposed volume was reasonable for the property.
- 9.7 Mr Craig remained of the view that given the site was adjacent to the State Highway it had high to moderate visibility, with moderate to low sensitivity. He agreed that the location was modified and it had a moderate natural character. He also agreed that the site had absorption capacity due to modifications connected with farming operations, shelter trees, power lines, and buildings.
- 9.8 He still remained concerned about the absence of a buffer between the proposed irrigation area and the lake. He was also of the view that a buffer was required between the irrigation area and State Highway 8.

**CRC012033**

- 9.9 The applicant noted during questions that the discharge consent would only be required for a term of 5 years until the spray conversion has been completed. But Ms Penman considered that they would still be required after the conversion to allow for excess stock water discharges.

## 10 APPLICANT'S RIGHT OF REPLY

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- 10.1 As for his opening, Mr Chapman's right of reply was presented on behalf of all UWAG members. However he also provided some specific comment on individual proposals.
- 10.2 In relation to this particular application, Mr Ewan Chapman confirmed that efficiency of 80% for Irricalc was used to determine annual volumes. The 70% pointed out in Ms Penman's addendum report was a typographic error. Irricalc defaults to an efficiency value of 80%.
- 10.3 Turning to more general comments, Mr Chapman challenged Dr Freeman's Table 5, contained within his first addendum report dated 12 January 2010. Mr Chapman contended the list was flawed because applications are placed in the red category solely by virtue of their location within the Ahuriri Catchment. Mr Chapman considered the correct approach for the ranking of the applications was to determine where they sit in relation to the existing environment.
- 10.4 He noted there had been much emphasis on nutrient management but he contended we should also be considering sustainability of the erosion-prone fragile soils within the catchment. He also submitted we should take note that district plans encourage farming, including irrigation, within these environments; and the tenure review undertaken by the Crown encourages intensification of land use retained in freeholding ownership in order to release more vulnerable pastures to be set aside under Crown ownership.
- 10.5 He also contended we should consider economic implications on the survival of these farms given their investment in infrastructure as a factor. He also noted we should take into account managing the land in light of weed and pest problems and how irrigation assists in that regard.
- 10.6 Mr Chapman addressed us on the MWRL proposition in terms of the Ahuriri River, namely a needs plus a buffer approach. Mr Chapman made it clear that the UWAG applicants in the Ahuriri, which includes this application, at the time of reply had only just received information relating to each individual farm's NDA, but noted this approach was of critical concern.
- 10.7 In terms of staging of implementation, Mr Chapman told us that undoubtedly those UWAG applicants, this applicant among them, may choose to stage the introduction of a new system of irrigation.
- 10.8 We did subsequently receive from Mr Chapman generic conditions and revised FEMPs applicable to all the UWAG applicants.

## 11 STATUTORY CONTEXT

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- 11.1 The relevant statutory context for a **discretionary** activity is set out in detail in our Part A decision. In accordance with those requirements, we have structured this evaluation section of our report as follows:
- (a) Evaluation of effects
  - (b) Evaluation of relevant planning instruments
  - (c) Evaluation of other relevant s104 matters
  - (d) Part 2 RMA
  - (e) Overall evaluation

## 12 EVALUATION OF EFFECTS

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- 12.1 Drawing on our review of the application documents, the submissions, the Officers' Reports, the evidence presented at the hearing and our site inspection, we have concluded that the effects we should have regard to are:
- (a) Flows and ecological values
  - (b) Water quality effects
  - (c) Effects of inefficient take and use

- (d) Landscape effects
  - (e) Tangata Whenua values
  - (f) Effects of discharge
  - (g) Positive effects
- 12.2 In assessing effects we have borne in mind that we are in fact assessing two parts of the proposal. The first we call the existing irrigation system made up of border dykes and distribution channels. The second part is the intended spray irrigation system. In terms of the first part, this activity has a differing set of effects than the second that are generally more adverse. However we think a continuation of these adverse effects is acceptable taking into account the following points.
- 12.3 First the activity has been ongoing for a considerable number of years. Consequently the effects of it are already present within the environment. Secondly, the activity will only continue for a limited period of time. Finally, continuation of the status quo enables funding to accrue to provide for conversion to spray, which provides an overall improved environmental outcome.
- 12.4 What follows in terms of assessing effects principally relates to the spray irrigation system.

### **Flows and ecological values**

- 12.5 Fish and Game NZ lodged several submissions on this application and described in detail the Otamatapaio catchment, its importance for fisheries values and the pressure that existing and proposed water abstraction is placing on instream values.
- 12.6 Canterbury Regional Council have assessed the minimum flow on the Otamatapaio River as being 200 litres per second at the Footbridge, which was equivalent to the 5-year 7-day low flow, in line with Table 3, row xii of the WCWARP. The applicant proposed this minimum flow. The location of the minimum flow site is not at the "downstream end of the catchment". However the minimum flow site was a well established recorder site with a stable gauging reach.
- 12.7 Fish & Game initially had concerns with the location however they are now satisfied with the proposed minimum flow and monitoring location as was Mr David Stewart.
- 12.8 Dr Meredith considered that in the shoulder irrigation season, when trout and salmon spawning is likely to occur, it would be beneficial to have higher flows in the order of 400 litres per second to ensure surface flow is retained at SH83. However while it may be desirable to have a minimum flow that is higher in the shoulder seasons, the natural flows in the river at this time are likely to be above the minimum for most of the time.
- 12.9 The consensus of the hydrologists was that the year-round flow is retained in the Otamatapaio River upstream of the Footbridge and that will continue to provide instream habitat for native fauna.
- 12.10 We received evidence from Mr Boraman on behalf of the applicant as to the appropriate minimum flow regime for the proposed take, including discussion of flow sharing regimes. We accept Mr Boraman's evidence and have included his recommended conditions into the conditions of consent. In summary this provides for a minimum flow of 200 L/s in the Otamatapaio River, with a reduction regime between 450 L/s and 200 L/s. We consider that adopting these restrictions on minimum flows will adequately protect the ecosystems of the streams and takes into account effects on other users.
- 12.11 The applicant proposed to install a fish screen adjacent to the existing intake. The fish screen would be in accordance with "Fish Screening: good practice guidelines for Canterbury", NIWA Client Report: CHC2007.092, October 2007 to us satisfy us that effects on fishery values would be minor.
- 12.12 We consider that in setting minimum flows for the WCWARP, protection of instream ecological values has been taken into account. The applicant would be required to install a suitable fish screen as detailed in the conditions, and given they proposed to cease abstraction in accordance with the environmental flow and allocation limits established for the Otamatapaio catchment as set out in the WCWARP, we consider the effects of the proposed diversion and take on flows and ecological values would be minor.

## Water quality effects

- 12.13 The applicant has been involved with the study by MWRL on cumulative effects within the catchment. Within Part A of this decision we have reviewed the MWRL study and our findings have been taken into account in our consideration of this application.
- 12.14 In Part A we rejected the MWRL proposition that all consents sought in this hearing could be granted (with conditions) and without causing cumulative water quality effects. It is incumbent upon us, therefore, to consider (as far as is possible) whether granting this application, in combination with other water permits we grant, will lead to unacceptable water quality effects. In this case it means considering the potential effects of granting this application (in combination with others we grant) on:
- (a) The Ahuriri Arm of Lake Benmore
  - (b) Groundwater chemistry and in particular the proposed threshold of 1 mg/L NO<sub>3</sub>-N; and,
  - (c) Periphyton and other ecological effects in the Otamatapaio River
- 12.15 The applicant has proposed mitigation measures to lessen the risk of their activities contributing to cumulative water quality effects. We need to consider whether the proposed mitigations, are in our view, sufficient to avoid significant water quality effects occurring, and/or whether refinements to the measures proposed are required.
- 12.16 A starting position for the consideration of effects on points (a)-(c) above is the FEMP. Final FEMPs were provided to ECan on 22 November 2010. Evidence on the draft FEMP was given by Mrs Johnston, but for consistency with other decisions we have undertaken an independent audit. Key points arising from our audit in relation to this application and additional to Mrs Johnston's is summarised below:

### Bog Roy

- (a) Soils are given as "Eweburn 45mm, Grampians 90mm, and Streamlands 90 mm and 100 mm." We assume this relates to PAW. There is no information of the distribution of the soils, particularly in relation to existing or proposed irrigation areas,
  - (b) The FEMP recognises the Ahuriri Arm of Lake Benmore as requiring the most severe nutrient mitigations for Bog Roy, i.e., an additional 10.7 kg N/ha/y are required to be prevented from leaching (or otherwise lost from the system) and 1.1 kg P/ha/y compared with that achieved using good agricultural practice.
  - (c) The modelled OVERSEER outputs for Bog Roy were 8505 kg N/y and 106 kg P/y.
- 12.17 The mitigations proposed in addition to those assumed in OVERSEER are listed as:
- (a) No winter application of fertiliser on the irrigation area;
  - (b) N fertiliser applications split to under 50 kg N/application;
  - (c) No P fertiliser within three weeks of irrigation;
  - (d) Olsen P of below 30 maintained.
- 12.18 Mitigation measures proposed to ameliorate site specific environmental risks are:
- (a) Fence off the streams that are located within a paddock that is used by stock regularly, if the paddock is not used regularly a temporary waratah fence would be acceptable, leave drinking bays for stock water;
  - (b) Redevelopment of existing irrigation to spray;
  - (c) 20 metre layback from any permanent waterway while applying fertiliser by land based application;

- (d) Fence (permanent or temporary while stock present) a 5-11 metre irrigation buffer zone back from any waterway (Lake Benmore).

12.19 The most significant mitigation with respect to this application is the commitment to change from border dyke to spray within a five year period. We note that Dr Robson (MWRL) did not provide examples of the effectiveness of converting border dyke to spray in terms of a reduction in nutrient losses, but from her reported improvements associated with levelling a border dyke system we infer that a total change will be very significant; particularly with respect to phosphorus losses.

12.20 The critical issues for us for are:

- (a) Is the predicted nutrient load realistic?
- (b) What effect will the predicted nutrient load (alone and in combination with other applications before us) have on surface waters making reasonable assumptions about flow paths?
- (c) Can the effects be avoided, remedied or mitigated?

#### Predicted load realistic

12.21 The inputs to OVERSEER were audited by Mr McNae. In his final addendum report he reported as a 'live' issue that the applicants preferred to stay with the developed setting in OVERSEER following advice from Mr McFarlane that a highly developed status would never occur. We accept Mr McFarlane's point on this point, but our interpretation of Dr Snow's evidence (Part A) was that she advocated use of the highly developed setting on shallow soils, not because they were likely to reach that status, but rather as a pragmatic response to reflect that OVERSEER would significantly underestimate nitrogen losses on shallow soils. We have paid particular attention to the soil types on each proposed irrigation area and for those that we consider 'shallow' we considered the developed setting on OVERSEER was likely to underestimate actual loads. For this farm we do not have the information of soil type distribution and therefore we have erred on the side of caution and assumed the soils are shallow.

12.22 However any underestimate of nutrient load due to shallow soils needs to be offset by the area being irrigated, its effects on total farm production, and hence on increase on nutrient load brought about by the irrigation.

#### Effects on waterbodies

##### *Ahuriri Arm of Lake Benmore*

12.23 In part A we determined that the Ahuriri Arm of Lake Benmore was already close to the oligotrophic-mesotrophic boundary. MWRL agreed with this assessment, but submitted that through improvements to replacement consents and significant nutrient mitigation of new consents, all consents could be granted without causing the oligotrophic-mesotrophic boundary to be breached. We disagreed with the MWRL submission for the reasons given in Part A. Therefore we need to assess each application on its own merits, but taking into account other applications before us together with priority issues.

12.24 Dr Freeman's addendum (on behalf of the Regional Council) gave a useful summary of estimated total property nitrogen loads to the Ahuriri Arm associated with irrigation development proposals, together with their priority as determined by Professor Skelton on the basis of the date the application was deemed to be notifiable. Dr Freeman's (Table 7) figures (based on modelling using the developed setting only) gave the total predicted nitrogen load lost from this and the component of CRC012017 that is also a replacement as 8511 kg N/y) which represents a ~4.5% of the current load estimated for the Ahuriri Arm (see Part A, Section 9).

12.25 For new applications we have estimated the actual new load in excess of the permitted activity (i.e. dryland farming). However as this a replacement consent for an activity that has been going on since the 1960s then this estimate is unnecessary because it is a lawfully permitted activity that has been contributing to the current trophic state of the Ahuriri Arm. As the applicant's proposed changes in their irrigation system will not increase the area irrigated, and they propose a comprehensive mitigation package, our view is that the contribution to the nutrient load on the Ahuriri Arm from this activity will decrease significantly.

### *Groundwater*

12.26 We agree with Dr Bright that effects on groundwater in this case are manifest by interaction with surface waters and that groundwater is largely a matter for policy considerations. We do not accept the assertion in the WQS that Bog Roy does not have a groundwater catchment but we do accept it is small compared with other groundwater catchments and unimportant in terms of our considerations.

### *Periphyton Growths in Otamatapaio River*

12.27 As noted above there has been no evidence presented on periphyton in any of the above river. However we do not accept that there is no issue to consider.

12.28 In Part A we rejected the MWRL proposal that the threshold for periphyton growth should be a 25% increase in maximum annual biomass calculated from modelled 'current' nutrient concentrations. We found instead, that MfE periphyton guidelines are applicable and should be used to protect streams from nuisance periphyton growths.

12.29 There are two important elements that will determine whether the MfE guidelines are likely to be breached:

- (a) The flow path of drainage water/groundwater to the Otamatapaio River; and
- (b) The amount of dilution as the drainage water mixes with these waterbodies, particularly under summer low-flow conditions.

12.30 Superimposed on both of these elements is the groundwater travel time. However, for our purposes, that only affects the timing of any effect, rather than the effect itself. In any case considering the topography and location of the proposed irrigation areas in relation to the above water bodies it is likely that travel time will be short and that any effects will be manifest relatively quickly.

12.31 We do not have sufficient information to calculate whether the mass flow of nutrients from the respective irrigation areas is likely to raise the concentration of nutrient in the Otamatapaio River. However, we think that if no such issues exist with the current border dyke system, then they are less likely once converted to spray. In the event that we granted this application it would be incumbent on the applicant to adhere to stream periphyton monitoring conditions, and to remedy any breaches.

### Avoided, remedied or mitigated

12.32 We acknowledge that the applicants have proposed mitigation measures in the FEMP to minimise the effects of their activities. It is difficult to assess the effectiveness of these mitigation measures as so much depends on how they are implemented. However the key measure in this application is the proposed conversion from border dyke to spray which we expect will result in a significant reduction in nutrients exported to the lake. This reduction will be especially pronounced with phosphorus which tends to be transported by surface runoff mechanisms, or which border dyke irrigation is an extreme example. As there is some evidence that the Ahuriri Arm is more sensitive to phosphorus than nitrogen this should be beneficial to lake water quality.

12.33 In his closing legal submissions, Mr Chapman stated that while some of his applicants may choose to participate in the lock-step approach, many of his clients could not. In any case, we have considered the lock-step approach and found it to be inappropriate to grant applications to take and use water on this basis. The lock-step approach is an extension of adaptive management, about which we gave our views in Part A. In summary, we are of the view that adaptive management (and the lock-step approach) should not be a substitute for a robust AEE and evidence in which the state of the existing environment is adequately described and reasonable efforts are made to address reasonably foreseeable environmental effects. As discussed in Part A, we are of the view that the MWRL WQS falls short of the standard expected for a proposal (the total consents for irrigation before us) of this magnitude.

### Summary on water quality effects.

- 12.34 Because this is a replacement consent in which there is a commitment on the part of the applicant to change from border dyke to an efficient spray irrigation system within 5 years together with other significant mitigation measures we conclude that once converted the effects of the activity will be minor.

### **Effects of inefficient take and use**

#### Annual volume

- 12.35 As discussed above, based on Irricalc calculations the applicant had proposed an annual volume for irrigation of 1,339,200 m<sup>3</sup>/yr under the existing border dyke system, reducing to 765,373 m<sup>3</sup>/yr on conversion to a spray system in five years time. Ms Penman seemed to be satisfied that the border dyke irrigation volume was reasonable, but took a different approach in relation to the appropriate annual volume for spray.
- 12.36 In relation to spray volumes, Ms Penman completed her calculation using GIS system and the method outlined in Report U05/15 ("the WQN9v2 approach"). She based this calculation on arable land use with 100% light soil (PAW <75mm), and Effective Summer Rainfall of 195mm. Using these figures, Ms Penman recommended an annual volume of 651,000 cubic metres would be a more appropriate and efficient volume of water for spray irrigation of the proposed area.
- 12.37 As acknowledged by the applicant, under Policy 16 of the WCWARP there are two acceptable methods for calculating and efficient annual volume. The first is using a soil water balance approach. The applicant contends that Irricalc is such an approach. The second alternative is the WQN9v2 approach used by Ms Penman.
- 12.38 Of the two alternatives, we consider that the available data allows the WQN9v2 approach to be used for calculating annual volumes. We note that the Irricalc methodology requires supporting data that is not currently available and requires verification when the proposal is in place. We have some concerns about the data and measurements on which the Irricalc calculations were based, which may not be adequate to satisfy the requirements of a soil water balance approach under Policy 16.
- 12.39 Based on the above, we consider that to adopt the annual volume proposed by the applicant may allocate more water than what is required and result in an inefficient use of water. We therefore prefer the annual volume of 651,000 cubic metres calculated by Ms Penman using the WQN9v2 approach and adopt this as the appropriate volume of water for spray irrigation of the proposed area.

#### Conveyance / distribution efficiency

- 12.40 In addition to annual volumes, the other issue relevant to efficiency in this case is potential water lost through conveyance of the water through the race network.
- 12.41 The applicant has allowed for race losses of 10% for the conveyance system. They note that the race system has been in existence prior to the Waitaki Power Scheme was established and is part of the landscape and has naturally sealed itself over time. The majority of the water now lost is via evaporation and the cost of piping such a scheme is considered too expensive, given the losses are considered to be very minimal. They also consider that the imposition of an annual volume will mean the applicant will operate the scheme as efficiently as possible given the importance of every cubic metre of water.
- 12.42 Ms Penman considered that the applicant's analysis of the conveyance efficiency is appropriate and that the race network appeared to be well maintained during her site visit. We accept that allowing for 10% loss of water from the race network is acceptable in the circumstances and still represents an efficient use of water.

#### Efficiency conclusions

- 12.43 Based on the above, we consider that the appropriate annual volumes for the activity, taking into account irrigation needs and race losses, are as follows:

- (a) Border dyke = **1,488,000 m<sup>3</sup>/yr**. This includes 1,339,200 m<sup>3</sup>/yr for irrigation (as sought by the applicant) and 148,800 m<sup>3</sup>/yr for race losses (being 10% of the total).
- (b) Spray = **723,333 m<sup>3</sup>/yr**. This includes 651,000 m<sup>3</sup>/yr for irrigation (as calculated by Ms Penman) and 72,333 m<sup>3</sup>/yr for race losses (being 10% of the total).

12.44 If the above annual volumes are imposed, we consider that this represents an efficient and effective use of water.

### **Landscape effects**

- 12.45 After closely considering the competing evaluations from Mr Craig and Mr Glasson and after closely considering both Mr Craig's and Mr Glasson's graphic supplements, we prefer the position advanced by Mr Craig subject to the inclusion of a 20m buffer between the irrigation area and Lake Benmore. This 20m buffer has been proposed by the applicant in the final set of conditions provided.
- 12.46 Mr Glasson's graphic supplement portrays a farm working environment as does Mr Craig's. We think that the addition of the spray irrigation infrastructure will be readily absorbed into this working environment. We accept that there are views available from State Highway 83. They will be transitory and will not be a significant change from what currently exists. In terms of views from the lake, we do prefer the view expressed by Mr Craig that there will not be direct views from the lake to the application site. There is a degree of screening with the lakeside vegetation. Overall, we reach a conclusion, particularly having regard to the highly modified environment we are here dealing with, that the addition of irrigators to the landscape will not markedly change matters. We conclude the effects will be no more than minor. Given the activities that occur on the site and in close proximity to the site, we are not concerned about any greening effect. On this basis we consider that the landscape effects will be acceptable.

### **Tangata Whenua values**

- 12.47 The applicant was a contributor to the MWRL Water Quality Study (WQS) on the effects of the irrigation proposals and development of mitigation measures, a Cultural Impact Assessment (CIA) was produced as a part of this exercise. MWRL engaged Mr Mikaere, an independent expert on tangata whenua matters to peer review the CIA and advise applicants how to address cultural issues within their proposals.
- 12.48 Te Rūnangā o Ngāi Tahu in their general submission raised concerns relating to mixing of waters between catchments, deterioration of water quality, dewatering and residual flows, changes to sediment flow and deposition and impacts on sites of cultural significance.
- 12.49 Mr Paul Horgan advised us that following an intense period of assessing the applications that Ngāi Tahu had shifted the focus of their concerns to applications that involved large scale intensification and dairying.
- 12.50 The application is a replacement that with conversion to spray and implementation of mitigation measures proposed through the FEMP will result in a reduction of nutrients discharged from the property. We conclude that the activity coupled with the proposed mitigation and spray application will not have any significant effect on tangata whenua values.

### **Effects of discharge**

- 12.51 All the evidence we received confirmed that given the nature and scale of the discharge and the mitigation measures proposed, there would be no significant adverse effects on the environment. In addition there were no submissions raising any concerns with the proposed discharge. We are therefore satisfied that the effects of the proposed discharge are acceptable.
- 12.52 There was some confusion between the applicant and the investigating officer as to the end to continue the discharge consent once conversion to spray was completed. Our approach is to grant the discharge consent for the same terms as the take and use on the basis that if it is not needed by the applicant, no discharge will occur. If this outcome occurs, then the applicant may very well surrender the discharge consent.



## Positive effects

12.53 We were advised that irrigation had taken place on Bog Roy for a number of years and provides the stability to the overall farm. Mr Anderson described it as the heart of the farm compensating for harsh weather conditions and allowed farming to occur through dry years. Mr Anderson made the point that supplementary feed produced by irrigation reduced the stress on both the animals and the land during harsh weather conditions. We accept that these are positive effects of the proposal and have taken this into account.

## Key conclusions on effects

12.54 In relation to the actual and potential effects of the proposal, our key conclusions are as follows.

12.55 The applicant proposes to cease abstraction when the environmental flow and allocation limits established for the Otamatapaio catchment as set out in the WCWARP are reached. We therefore consider the effects of the proposed diversion and take on flows and ecological values would be minor.

12.56 In relation to water quality, because this is a replacement consent in which there is a commitment to change from border dyke to spray irrigation together with other significant mitigation measures we conclude that once converted the effects of the activity on water quality will be minor.

12.57 Provided that the annual volumes are imposed, we consider that this represents an efficient and effective use of water.

12.58 Given that this proposal is seeking to irrigate an area of land that is already irrigated (and has been for many years), we consider that any landscape effects are insignificant, as the effects of irrigation are already evident in the landscape.

12.59 We conclude that the activity coupled with the proposed mitigation and spray application will not have any significant effect on tangata whenua values.

12.60 We agree that the effects of the proposed discharge into Lake Benmore are acceptable.

12.61 We accept that allowing the proposal to occur will provide positive economic benefits for the applicant and provide stability to the overall farm.

## 13 EVALUATION OF RELEVANT PLANNING INSTRUMENTS

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13.1 Under s 104(1)(b) of the Act, we are required to have regard to the relevant provisions of a range of different planning instruments. Our Part A decision provides a broad assessment of those planning instruments and sets out the approach we have applied to identification and consideration of the relevant provisions. The following part of our decision should be read in combination with that Part A discussion.

13.2 In relation to the current applications, we consider that the most relevant and helpful provisions are found in the regional plans, including in particular the WCWARP and the NRRP. In addition, the Proposed and Operative CRPS and the relevant District Plans are of assistance in relation to landscape issues that arise.

13.3 The following sections of this decision provide our evaluation of the key objectives and policies from these planning instruments. We have organised our discussion in accordance with the key issues arising for this application.

### Water quality

13.4 In relation to water quality, the key documents we have considered are the WCWARP (incorporating the objectives of the PNRRP and the operative NRRP provisions).

13.5 In relation to the WCWARP, we consider that Objective 1 is the critical objective. In particular, Objective 1(b) seeks to safeguard life-supporting capacity of rivers, lakes, and Objective 1(d) seeks to safeguard the integrity, form, functioning and resilience of a braided river system.

- 13.6 We have determined that granting these consents with conditions (particularly those set out in the FEMP) combined with the conversion from border dyke to spray irrigation will help to minimise nutrient loss from the irrigated area. This gives us confidence that the off-site nutrient losses will be minimised and the health of streams flowing through the properties will be enhanced. We are also satisfied that the applicant's proposed changes in the irrigation system will not increase the area being irrigated and, given they propose a comprehensive mitigation package, our view is that its contribution to the nutrient load on Lake Benmore/Ahuriri Arm will decrease.
- 13.7 In terms of potential periphyton growths in Otamatapaio River, we received no data on the current state of the River or likely future change. However, given that this is a replacement consent for existing activities, we consider that the change in irrigation system and proposed mitigation measures should decrease the incidents of nuisance periphyton growths in these water bodies.
- 13.8 Overall, we can conclude that given the change in irrigation systems from border dyke to spray and mitigation measures proposed that those measures will significantly reduce the nutrient load on Lake Benmore and Otamatapaio River. Thus we are able to conclude that a grant of consent would be consistent with Objective 1(b) and 1(d) WCWARP.
- 13.9 Objective 1(c) requires us to manage waterbodies in a way that maintains natural landscape and amenity characteristics and qualities that people appreciate and enjoy. Given our findings in terms of effects on water quality and periphyton growths combined with a condition in terms of periphyton annual biomass not exceeding MfE guidelines during summer low-flow conditions, then our view is that granting consent would be consistent with Objective 1(c).
- 13.10 We note that Objectives 2, 3, 4, and 5 are "in the round" deal with and provide for the allocation of water. The critical qualification is that water can be allocated provided that to do so is consistent with Objective 1. Given the findings we have made about Objective 1 we conclude that allocating water in terms of the balance objectives would be consistent with the overall scheme of the WCWARP. We reach this view taking into account the national and local costs and benefits (environmental, social, cultural and economic) of the proposal, as required by Objective 3.
- 13.11 Policy 13 links the WCWARP to the PNRRP (as it existed at the time) by requiring us to have regard to how the exercise of the consent could result in water quality objectives of the PNRRP not being achieved. As we explained in our Part A decision, we have considered the objectives of the PNRRP and the now operative NRRP in relation to the current proposal. However we have generally given greater weight to the NRRP provisions on the basis that they represent the current approach for achieving the common goal of protecting water quality.
- 13.12 Under the NRRP, the Otamatapaio River within the vicinity of the application site is classified as "Hill Fed Lower". Objective WQL1.1 of the NRRP seeks to ensure that the water quality of such rivers is managed to at least achieve the outcomes specified in Table 5. A key indicator for these applications is that maximum chlorophyll-a should be less than 200 mg /m<sup>2</sup> (periphyton guideline for safeguarding aquatic biodiversity and also recreation). As mentioned above, we received very little evidence on this issue. However we are nonetheless satisfied that with appropriate periphyton monitoring conditions, granting this consent (in combination with others we grant) will not result in breaching of the periphyton guidelines and would remain consistent with this objective.
- 13.13 Lake Benmore (including the Ahuriri Arm) is classified as an "Artificial On-River Lake" under the NRRP. Objective WQL1.2 of the NRRP seeks to ensure that the water quality of the lake is managed to at least achieve the outcomes specified in Table 6, including a maximum Trophic Level Index ("TLI") of 3 (i.e. oligotrophic-mesotrophic boundary). For the reasons discussed above, we consider that granting consent to the proposal would be consistent with this objective and would not (in combination with others we grant) caused the TLI maximum to be breached.
- 13.14 Overall then having regard to the scheme of the WCWARP and the NRRP we reach a conclusion that granting consent in this case to the proposal as a whole would not be consistent with the key objectives and policies of both of these plans relating to water quality.

#### **Environmental flow and level regimes**

- 13.15 Policies 3 and 4 outline the values that must be maintained in the water bodies, and a number of matters that must be considered when setting an environmental flow and level regime, and are

particularly relevant to this application. Policy 4 has been discussed in more detail in the assessment of effects section. As the applicant is proposing to adopt the minimum flow required by the WCWARP, we are satisfied that the proposal is consistent with these policies.

- 13.16 Policy 41 deal with the environmental flow regime in the tributaries of Lake Benmore. Policy 41(ii) enables access to water for the activities identified in Objective 2, to the extent consistent with Objective 1. The applicant is proposing to adopt the minimum flow equivalent to the 5-year 7-day low flow as required by the plan, and is within the allocation for agricultural and horticultural activities identified in Rule 6, Table 5, therefore, the proposal is considered to be consistent with this policy.

### **Efficient and effective use**

- 13.17 As we read the provisions of the WCWARP, there is a strong and clear focus on the efficient use of water.
- 13.18 Policies 15 – 20 provide for an efficient use of water so that net benefits are derived from its use and are maximised and waste minimised. In particular, Policy 16 requires us to consider whether the exercise of these consents would meet a reasonable use test in relation to both the instantaneous rate of abstraction and the annual volume for take, use, dam or divert. As discussed in our evaluation of effects, provided that the lower annual volume calculated by the s42 officer is adopted, we are satisfied that the rates and annual volumes reflect an efficient and effective use of water and that the reasonable use test can be met.
- 13.19 Objective 3 of the WCWARP requires us to recognise the beneficial and adverse effect on the environment of allocating water, along with the national and local costs and benefits. We consider that if water is allocated inefficiently, then this results in adverse effects on the environment in terms of water quality and also increased costs and lower benefits. On the other hand, if water is allocated in a manner that ensures its efficient use, the reverse is likely to be true.
- 13.20 Objective 4 of the WCWARP requires us to promote the achievement of a high level of technical efficiency in the use of allocated water. That can be achieved in this instance by converting the current border dyke systems, which are technically inefficient, to spray irrigation. Application by spray within the constraints of an annual volume will require a high degree of efficiency to ensure that crops and pasture are not stressed in extreme conditions and water is not wasted.
- 13.21 Relevant in this circumstance because we are here considering a replacement application, is Policy 28. Under this policy we need to consider whether the applicant has made all reasonable attempts to meet the efficiency expectations of this plan. We must recognise the value of investment that the existing consent holder has made and we must maintain the inclusion of the consent if granted in any allocation limits and priority plans on the waterbody concerned.
- 13.22 In terms of whether or not all reasonable attempts to meet the efficiency expectations of the Plan have been undertaken, with the proposal to convert the current border dyke system to spray irrigation we conclude that the applicant has taken all reasonable attempts to meet the efficiency expectations of the Plan.

### **Landscape**

- 13.23 We discussed the relevant objectives and policies for landscape in our Part A Decision. In summary these are primarily found in the Proposed and Operative CRPS and the NRRP. In broad terms these provisions seek the protection of outstanding natural landscapes from inappropriate use and development. In considering these provisions we are informed by the provisions of the Waitaki District Plan which identifies the applicant's property as a classified Rural Scenic Zone.
- 13.24 Given our conclusion on effects above, we consider that with the proposed mitigation measures granting consent to this proposal will be consistent with the relevant objectives and policies relating to landscape

### **Discharge**

- 13.25 In relation to the discharge application (CRC041333), the key provisions of relevance can be found in the water quality chapter of the NRRP (Chapter 4). This includes Objective WQL1.1 discussed above, along with Policy WQL1 which relates specifically to point source discharges that

may enter surface water. Given our conclusion on the effects of the discharge above, we are satisfied that the proposed activity is consistent with these provisions.

### **Tangata whenua**

- 13.26 Objective 1(a) of the WCWARP relates to the integrity of mauri and is closely linked to Objective 1(b). Mr Mikaere (for MWRL) submitted that there are two aspects of mauri; the tangible and the intangible and that we could only properly deal with tangible. His view was that the tangibles are able to be addressed if mauri is considered as representing the health of the particular water body in question. Given that we consider that by granting these consents with conditions and with the mitigation measures proposed by the applicant that sustainable water quality outcomes can be achieved, it follows that the integrity of the mauri will be attained.
- 13.27 Objective WQN1 from Chapter 5 NRRP seeks to enable present and future generations to access the region's surface-water and groundwater resources to gain cultural, social, recreational, economic, and other benefits while (c) safe-guarding their value for providing mahinga kai for Ngāi Tahu and (d) protecting wāhi tapu and other wāhi taongā of value to Ngāi Tahu. This Objective aligns with one of the principal aspirations expressed by Ngāi Tahu during the hearing of enhancing mahinga kai resources and supporting ecosystems. Our finding is that there is unlikely to be deterioration in water quality of the Ahuriri Delta as a consequence of this proposal and that this application is consistent with this Objective.
- 13.28 Objective WTL1(d) from Chapter 7 NRRP seeks to achieve no overall reduction in the contribution wetlands make to the relationship of Ngāi Tahu and their culture and traditions with their ancestral lands, water, mahinga kai sites, wāhi tapu, and wāhi taongā. We find that this proposal is within the acceptable thresholds for water quality and would be consistent with this Objective.

### **Key conclusions on planning instruments**

- 13.29 For all of the above reasons we consider that, with the imposition of appropriate conditions granting consent would be consistent with the objectives and policies of the relevant plans. We have reached this conclusion taking into account the relevant planning provisions in respect of water quality, efficiency, environmental flows, landscape, tangata whenua values and discharges

## **14 EVALAUTION OF OTHER RELEVANT S104 MATTERS**

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- 14.1 Section 104(2)A RMA provides:

*“When considering an application affected by section 124, the consent authority must have regard to the value of the investment of the existing consent holder”*

- 14.2 We consider that the value of the investment of the existing consent holder includes the current irrigation system as well as the farming business. Taking that investment into account, we think it appropriate that we extend consent for a limited period of five years to enable further use of the border dyke irrigation system. This will enable the farming business to continue and accrue financial resources to support the conversion to spray.

## **15 PART 2 RMA**

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- 15.1 Section 104(1) RMA states that the matters which we have discussed above are subject to Part 2, which covers section 5 through section 8 inclusive. These sections are set out in full in our Part A decision and are discussed below in the context of the current applications.
- 15.2 We refer to all of the matters we consider relevant from sections 6 to 8 below, acknowledging that the three sections represent factors contributing to our evaluation under section 5 RMA.

### **Section 6 – Matters of National Importance**

- 15.3 Sections 6 RMA identifies matters of national importance that we must “recognise and provide for” when making our decision, including, relevantly in this application: preserving the natural character of lakes and rivers (s6(a)); protecting outstanding natural features and landscapes (s6(b)); the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna (section 6(c)); and the relationship of Māori with the environment (s6(e)).

- 15.4 In respect of s6(a) we recognise that preservation of the natural character of lakes and rivers is the imperative. We think that because of our finding in terms of the water quality issues, which takes into account mitigation measures and implementation and development of spray irrigation on the site, the grant of consent recognises and provides for the preservation of the natural character of lakes and rivers.
- 15.5 In terms of s6(b), we have evaluated the natural features and landscape, primarily by reference to the relevant planning instruments. We reach the view that the grant of consent in this case is not inappropriate because it will not, in our view, diminish the natural features and landscapes such as they are in any significant way.
- 15.6 In terms of section 6(c), it is our view, taking into account the evidence received, that there are not areas of significant indigenous vegetation and significant habitats of indigenous fauna that are at risk thus requiring protection as a consequence of the grant of consent.
- 15.7 In relation to section 6(e) we are cognisant of the relationship that Ngāi Tahu hold with the natural resources of this area, and while no specific values were specified by Ngāi Tahu in relation to this application, we believe that the mitigation measures and conditions provide for the cultural relationship to this catchment that is of importance to Ngāi Tahu.
- 15.8 For the above reasons, we consider that granting consent to the proposal would recognise and provide for s6 matters, as we are required to do under the RMA.

### **Section 7 – Other Matters**

- 15.9 Section 7 lists “other” matters that we shall “have particular regard to”. We make the following observations in relation to each of those matters as they are relevant to this application, referring to the sub paragraph numbers of s7.
- 15.10 Sub-section (a) refers to kaitiakitangā. We consider that the proposed activity with mitigation measures and conditions sits within the acceptable environmental parameters outlined by Ngāi Tahu such that that it will not cause distress to the function of kaitiakitangā.
- 15.11 Sub-sections (b), (c), and (f) are specifically relevant to this application. Sub-section (b) relates to the efficient use and development of natural and physical resources. Relevantly in this case is water. We have determined that the volumes of water we are prepared to grant and the methodology of its conveyance and distribution, particularly after conversion to spray irrigation, results in the efficient use and development of the water resource.
- 15.12 Sub-section (c) refers to the maintenance and enhancement of amenity values. Maintenance and enhancement of amenity values will be achieved in this instance through utilising mitigation measures, such as those provided in the FEMP. These steps will ensure the maintenance and enhancement of amenity values.
- 15.13 In terms of sub-section (d), because of the assessments we have made in relation to ecosystems, we have had particular regard to the intrinsic values of ecosystems and we consider that through the grant of consent with the conditions imposed such values will be safeguarded.
- 15.14 Sub-section (f) refers to the maintenance and enhancement of the quality of the environment. The applicant has proposed mitigation measures to ensure that this objective is achieved.
- 15.15 Having particular regard to the above matters in the context of section 7, we conclude that the grant of consent could be supported.

### **Section 8 – Treaty of Waitangi**

- 15.16 Finally, section 8 requires that we shall take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi).
- 15.17 The cultural values of tangata whenua are appropriately recognised in the relevant planning documents applicable to the Mackenzie Basin sufficient to alert applicants to the need to address such values. We are satisfied that the notification of the appropriate Runangā and tribal authority has been followed and that the applicant was a contributor to the general assessment of the impact of irrigation activities on cultural values.

- 15.18 We are satisfied that the consultation procedures provided Ngāi Tahu with the opportunity to understand and respond to the proposed activity, albeit in conjunction with a large number of applications in the Mackenzie Basin.

## **Section 5 – Purpose of the RMA**

- 15.19 Turning now to the overall purpose of the RMA, that is, “*to promote the sustainable management of natural and physical resources*”.
- 15.20 The proposal will allow the development of land to occur, which may provide for the economic and social well-being of the community. The applicant has for those areas that are replacement consents proposed measures to “safeguard the life-supporting capacity of water” and “avoid, remedy or mitigate” the potential impacts on water quality and landscape values as required in Section 5(2)(c). By restricting the annual volumes to that which we consider consistent with the objectives of Section 5(2)(a), the proposal will also provide for the needs of future generations.

## **16 OVERALL EVALUATION**

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- 16.1 Under s104B of the RMA, we have a discretion as to whether or not to grant consent. This requires an overall judgment to achieve the purpose of the Act and is arrived at by:
- (a) Taking into account all the relevant matters identified under s 104;
  - (b) Avoiding consideration of any irrelevant matters;
  - (c) Giving different weight to the matters identified under s 104 — depending on our opinion as to how they are affected by the application of s 5(2)(a), (b), and (c) and ss 6-8 — to the particular facts of the case; and then in light of the above; and
  - (d) Allowing for comparison of conflicting considerations, the scale or degree of conflict, and their relative significance or proportion in the final outcome.
- 16.2 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 Act is to grant consent but with conditions aimed at increasing efficiency and decreasing nutrient load. By allowing the continuation of the border dyke system for a limited period strikes an appropriate balance between value of the existing infrastructure and improved environmental outcomes.
- 16.3 Our overall evaluation in terms of effects of granting consent with conditions is that they are acceptable. We also conclude that the grant of consent is consistent with all of the relevant policies and objectives of principally the WCWARP and the NRRP.

## **17 CONDITIONS**

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- 17.1 Given our decision to grant consent, we have given careful consideration to the conditions that are necessary to avoid, remedy and mitigate the potential adverse effects of the proposal. The starting point we have used for this exercise is the final condition set provided by the applicant. This was the result of a collaborative process that occurred after the conclusion of the hearing, as described in our Part A decision.
- 17.2 The condition set provided to us includes comments on discrete issues from Council officers and several submitters. Where any such comments have been made, we have taken this into account when arriving at the final condition set. We are proceeding on the basis that the condition set provided to us incorporates all relevant conditions required by Meridian Energy as part of its derogation approval. This has been confirmed by Council investigating officers and legal counsel for Meridian.
- 17.3 We have made some modifications and additions to the condition set provided to us. However, all modifications respect the conditions attaching to derogation approvals provided by Meridian. Several of these changes relate to matters discussed in the preceding sections of this decision to ensure that any concerns we have about potential effects are adequately addressed. In addition, we make the following comments on conditions.

- 17.4 In addition, we make the following comments on conditions relating to nutrients and thresholds. These comments are written in a general style that applies to all applications before us. However they are directly relevant to this application. We have incorporated the intent of these comments into the conditions attached to this decision.

#### Nutrients and thresholds

- 17.5 In Part A we rejected the MWRL proposition that we could grant all the applications before us with conditions.
- 17.6 Much of the evidence on conditions presented by all parties to this hearing centred on the issue of determining whether grantees in a particular subcatchment had breached the nutrient allowance at a particular node, and if they had, how the Council could determine either which consent holder had caused the breach and whether one or all consent holders needed to take corrective action.
- 17.7 In rejecting the MWRL case, which relied upon existing irrigators lessening their nutrient load so that there would be assimilative capacity for new irrigators, we need to record our approach to ensuring that consents we grant do not cumulatively result in the trophic level index (TLI) of the Ahuriri Arm of Lake Benmore exceeding 2.75, or the TLI of the Wairepo Arm of Lake Ruataniwha exceeding 4.00. As we recorded in Part A our view is that the difference between current nutrient load, and the load resulting in unacceptable increases in the TLI of these waterbodies is so small that it would be risky to try and allocate that new load.
- 17.8 For those applications that we are inclined to grant, we have assessed their 'cumulative effects' in priority order, taking careful note of the complete package of mitigation measures they propose on their property. These mitigation measures may be in relation to a separate application before us but on the same property and therefore 'captured' in the FEMP.
- 17.9 We have kept a check on new irrigation resulting in additional nitrogen and phosphorus loads proposed by applicants in relation to those mitigation measures and not granted consents that would, in our view, lead to a significant net increase.
- 17.10 This approach will, in our view, ensure that the TLI of the critical lake ecosystems does not rise as a result of our granting these applications, and may even decline. This approach is, we believe, consistent with the NRRP, which has as an objective and maintenance or improvement of water quality. It also has the advantage, in our view, of taking the pressure off cumulative effects monitoring with all the ensuing uncertainties and difficulties discussed in Part A,
- 17.11 Recognising that streams and rivers in the catchment are nutrient limited by nitrogen and/or phosphorus, and that the NZ (MfE) Periphyton Guidelines provide appropriate thresholds for managing nuisance periphyton growths, we believe, provide another monitoring tool for not only ensuring that streams and rivers are suitable for recreation and provide suitable habitat for invertebrates and fish, but also provide another defence to downstream lake ecosystems. The reporting of breaches in periphyton guidelines together with correction mitigation actions, provide a tool to prevent excess nutrients reaching the lakes.
- 17.12 We recognise that where leachate enters groundwater that does not discharge to streams or rivers prior to entering Lake Benmore, periphyton monitoring is not appropriate. However for the majority of the applications before us, there is a stream or river downstream that provides a logical focus for offsite monitoring efforts. In cases where this is not the case we have imposed other monitoring requirements such as lysimeter or piezometer networks, and/or contributing to lake monitoring.
- 17.13 The advantage of stream water quality and periphyton monitoring is that it puts more emphasis on local monitoring and less emphasis on uncertain (given our findings on the WQS) modelling. We are of the view that as far as possible, consent monitoring should be related directly to the applicant's activities.
- 17.14 We did consider deleting the agreed conditions relating to lake TLI monitoring on the grounds that it was marginal whether trigger response conditions were relevant to replacement consents. The critical issue for us was whether the effects of replacement consents could be considered less than minor (with respect to lake water quality).
- 17.15 However upon reflection we have decided that (in the case of the Ahuriri Arm of Lake Benmore, and the Wairepo Arm of Lake Ruataniwha) the existing TLI is very close to the agreed trigger

point, and the TLI may increase even without the grant of new consents (due to groundwater lag effects). We are reasonably confident however that this will not occur because by and large these activities have been 'on foot' for a long period of time and we think this is reflected in the current TLI. However, we cannot be completely certain and it seemed to us rather than leave the matter we should do something about it to at least provide a mechanism to respond to groundwater lag effects, if they occurred.

- 17.16 Thus, if TLI were to increase above the agreed trigger points then the lake monitoring conditions would serve a resource management purpose; particularly in conjunction with the condition to ratchet back existing irrigation. On balance, we have decided to retain the agreed lake monitoring conditions for Lake Benmore and the Wairepo Arm of Lake Ruataniwha.
- 17.17 An advantage of the approach discussed above is that it rewards applicants (through the granting of consents) prepared to convert from inefficient border dyke systems to modern pivot irrigators. Not only are there efficiency gains to be made by such conversion, but significant reductions in nutrient losses will also result.

## **18 DURATION**

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- 18.1 The applicant has sought a duration of 35 years for the take and use consent. Because this application is a "true replacement" it is not affected by the common conditions sought by Meridian requiring an expiry date of April 2025. This is reflected in the consent conditions provided.
- 18.2 Meridian, through Mr Turner, suggests that there are benefits in having a common expiry date for all consents to take water within the catchment to do with assessing cumulative effects.
- 18.3 To determine this issue we have referred to and applied the approach set out within the NRRP, Chapter 1, Section 1.3.5, which sets out some considerations that impact on duration. In particular we have placed weight on the following matters there referred to:
- (a) *the nature and sensitivity of the affected environment, including:*
- (i) *the degree to which the sensitivity of the affected environment may become more sensitive over time; and*
- (ii) *the probability of future adverse effects arising from the consented activity; and*
- (iii) *the level of knowledge about the affected environment;*
- 18.4 Section 1.3.5 contains a range of other guidance criteria, which includes the consent holder's capital investment in a pre-existing activity. However, we think that the nature and sensitivity of the affected environment plus the three criteria we have listed above are the most significant.
- 18.5 Given our findings in relation to the current TLI status of the Ahuriri Arm of Lake Benmore and the degree to which the sensitivity of the affected environment, namely the Ahuriri Arm, may become more sensitive over time and the probability or possibility of future adverse effects arising from this consented activity and others, and the level of knowledge about the affected environment, we do support Mr Turner's call for a common expiry date.
- 18.6 We do recognise this will have impacts upon the consent holder's interests. In particular, the consent holder's need to ensure that there are permanence and economic life of the activity. However, in that regard we do note that provided the consent holder seeks to renew its consent in accordance with the RMA, there is a level of permanence and economic life for the activity. We also think that the term of the grant, which will be approximately 13 years, does provide for a level of permanence and economic life of the activity. A term of this duration would provide benefits to the community and would enable the consent holder to achieve some level of return on capital investment involved.
- 18.7 In terms of the discharge consent, we have decided to grant this for a period of 35 years notwithstanding the shorter term of the take and use consent. The key reason for this is that the effects of the activity are very minor and there is not the same uncertainty about change in the sensitivity of the receiving environment over time. As such, we consider that there is no resource management basis for a shorter term.



18.8 We note that the discharge of surplus irrigation water may cease upon full conversion to spray. However there may remain the need to discharge excess stock water, depending on whether or not the applicant retains the existing irrigation races. Unlike the take of stock water, this discharge is not covered by s14(3) of the RMA. We have therefore decided to provide consent for a full 35 year term to provide flexibility to the consent holder. If the discharge ceases within this time, then the consent could easily be surrendered by the consent holder.

## 19 DECISION

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- 19.1 Pursuant to the powers delegated to us by the Canterbury Regional Council; and
- 19.2 For all of the above reasons and pursuant to sections 104 and 104B of the Resource Management Act 1991, we **GRANT** applications CRC012019 and CRC012033 by KJ, DK and SR Anderson for the following activities:
- CRC012019** for a water permit to divert, take and use water from the Otamatapaio River for the spray and border dyke irrigation of 105 hectares of pasture and winter crop on Bog Roy Station; and
- CRC012033** for a discharge permit to discharge by-wash water and excess stockwater from an irrigation race into Lake Benmore.
- 19.3 Pursuant to section 108 RMA, the grant of consent is subject to the conditions specified at **Appendices A and B**, which conditions form part of this decision and consent.
- 19.4 The duration of CRC012019 shall be until the 30<sup>th</sup> April 2025. The duration of CRC012033 shall be for 35 years from the commencement of the consent.

**DECISION DATED AT CHRISTCHURCH THIS 21<sup>ST</sup> DAY OF DECEMBER 2011**

Signed by:

Paul Rogers	 _____
Dr James Cooke	 _____
Michael Bowden	 _____
Edward Ellison	 _____

## APPENDIX A

### Conditions of Consent (CRC012019) – Take and Use

1. Water shall only be diverted from the Otamatapaio River, at or about map reference NZMS 260 H40: 7868-2126 at a rate not exceeding 100 litres per second, with a volume not exceeding 8,640 cubic metres per day and 1,488,000 cubic metres between 1 July and the following 30 June for the first five years after the commencement of the consent and 723,333 cubic metres between 1 July and the following 30 June thereafter.
2.
  - a. Water shall be used for the border dyke and spray irrigation of crops and pasture of 105 hectares per irrigation season within the area of land shown on attached plan CRC012019 which forms part of this consent.
  - b. There shall be a minimum 5 metre setback, where there is no irrigation, from any permanently flowing waterways within the irrigation area marked on Plan CRC 0120219
  - c. There shall be a minimum 20 metre setback, where there is no irrigation, from Lake Benmore.
3. The consent holder shall take all practicable steps to:
  - a. Ensure that the volume of water used for irrigation does not exceed that required for the soil to reach field capacity; and
  - b. Avoid leakage from pipes and structures; and
  - c. Avoid the use of water onto non-productive land such as impermeable surfaces and river or stream riparian strips.
4.
  - a. The consent holder shall, prior to exercising this consent, install a water meter measuring device NZMS 260 H40: 759-168 in the Otamatapaio River that will enable the determination of the continuous rate of flow in the reach of the water body to within an accuracy of 10 percent.
  - b. The measuring device shall, as far as is practicable, be installed at a site likely to retain a stable relationship between flow and water level. The measuring device shall be installed in accordance with the manufacturer's instructions.
  - c. install a tamper-proof electronic recording device such as a data logger(s) that shall time stamp a pulse from the flow meter at least once every 15 minutes, and have the capacity to hold at least one season's data of water taken as specified in clauses (d)(i) and (d)(ii), and which is telemetered, as specified in clause (d)(iii).
  - d. The recording device(s) shall:
    - i. be set to wrap the data from the measuring device such that the oldest data will be automatically overwritten by the newest data (i.e. cyclic recording); and
    - ii. store the entire season's data in each 12 month period from 1 July to 30 June in the following year, which the consent holder shall then download and store and provide to the Canterbury Regional Council in a format and standard specified in the Canterbury Regional Councils form for Water Metering Data Collection; and be readily accessible to be downloaded by the Canterbury Regional Council or by a person authorized by the Canterbury Regional Council: RMA Compliance and Enforcement Manager; and

- iii. shall be connected to a telemetry system which collects and stores all of the data continuously with an independent network provider who will make that data available in a commonly used format at all times to the Canterbury Regional Council and the consent holder.
  - e. The measuring and recording devices described in clauses (a) and (c) shall be available for inspection at all times by the Canterbury Regional Council.
  - f. data from the recording device described in clause (c), and the corresponding relationship between the water level and flow (b), shall be provided to the Canterbury Regional Council annually in the month of June, and shall be accessible and available for downloading at all times by the Canterbury Regional Council.
- 5. Whenever the flow (expressed in litres per second) in Otamatapaio River, as estimated by the Canterbury Regional Council calculated as the mean flow for the previous 24 hour period (midnight to midnight) at map reference H40:759-168 water for irrigation may be taken:
  - a. At a rate not exceeding 100 litres per second when river flows in the Otamatapaio River are greater than 450 litres per second; and
  - b. at a rate not exceeding 100 litres per second when river flows in the Otamatapaio River are less than 450 litres per second but greater than 200L/s, provided that the take complies with a sharing regime that limits the combined rate of abstraction to ensure that the flow in the Otamatapaio River at Footbridge less the combined flow of CRC012047 (Otamatapaio) and CRC012019 (Bog Roy) is equal to or greater than 200 litres per second
  - c. when the flow in the Otamatapaio River is equal to or less than 200 litres per second taking of water in terms of this permit for irrigation purposes shall cease.

OR

provided that the Canterbury Regional Council, in consultation with a Water Users Committee representing, but not limited to, surface water and hydraulically connected groundwater users, who are subject to the above minimum flow, has determined upon a water sharing regime which limits the total abstraction from the resource as referred to above then the taking of water in accordance with that determination shall be deemed to be in compliance with this condition.

- 6. The consent holder shall ensure water races used to convey water diverted in terms of this permit are well maintained to minimise losses.
- 7. The consent holder shall, within six months of the commencement date of this consent at the point of take:
  - a.
    - i. install a water meter(s) that has an international accreditation or an equivalent New Zealand calibration endorsement suitable for use with an electronic recording device, from which the rate and the volume of water taken can be determined to within an accuracy of plus or minus five percent at a location(s) that will ensure the total take of water from Otamatapaio River is measured; and
    - ii. install a tamper-proof electronic recording device such as a data logger that shall record (or log) the flow totals every 15 minutes and have the capacity to hold at least one season's (as specified in conditions (3) and (4(a))) data of water taken as specified in clause (b) (i), or which is telemetered, as specified in clause (b)(ii).
  - b. The water meter and recording device(s) shall be set to wrap the data from the measuring device(s) such that the oldest data will be automatically overwritten by the newest data (i.e. cyclic recording); and shall:
    - i. store the entire season's data in each 12 month period from 1 July to 30 June in the following year, which shall be downloaded and stored in a commonly used format and provided to the Canterbury Regional Council upon request in a form and to a standard specified in writing by the Canterbury Regional Council; or

- ii. be connected to a telemetry system which collects and stores all of the data continuously with an independent network provider who will make that data available in a commonly used format at all times to the Canterbury Regional Council and the consent holder. No data in the recording device(s) shall be deliberately changed or deleted.
  - c. The measuring device shall be installed at a site likely to retain a stable rating (i.e. a man-made channel, concrete, steel or fibreglass pipe). Installation shall be in accordance with ISO 1100/1-1981 or equivalent and be undertaken by a suitably qualified person.
  - d. The water meter and recording device(s) shall be accessible to the Canterbury Regional Council at all times for inspection and/or data retrieval.
  - e. 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.
  - f. All practicable measures shall be taken to ensure that the water meter and recording device(s) are at all times fully functional and have an accuracy standard of 10%.
- 8.
- a. The water meter installed in accordance with Condition 7 shall be an electromagnetic or ultrasonic meter; or
  - b. The consent holder shall, within six months of the commencement date of this consent install or make available an easily accessible straight pipe(s) at a location where the total water take is passing through, with no fittings or obstructions that may create turbulent flow conditions, of a length at least 15 times the diameter of the pipe, as part of the pump outlet plumbing or within the mainline distribution system, to allow the Canterbury Regional Council to conduct independent measurements.
9. Within one month of the installation of the measuring or recording device(s), specified in conditions 7 or any subsequent replacement measuring or recording device(s), or at any time when requested by the Canterbury Regional Council, the consent holder shall provide a certificate to the Canterbury Regional Council, attention: RMA Compliance and Enforcement Manager, signed by a suitably qualified person certifying, and demonstrating by means of a clear diagram, that:
- a. the measuring and recording device(s) is installed in accordance with the manufacturers specifications; and
  - b. data from the recording device(s) can be readily accessed and/or retrieved in accordance with clauses (b) of condition 7
10. At five yearly intervals or at any time when requested by the Canterbury Regional Council, the consent holder shall provide a certificate to the Canterbury Regional Council, attention: RMA Compliance and Enforcement Manager, signed by a suitably qualified person certifying that:
- a. the water meter(s) is measuring the rate of water taken as specified in condition 7 and
  - b. the tamper-proof electronic recording device is operating as specified in condition 7
- 11.
- a. Water shall only be taken when a fish screen with a maximum mesh width and height size of 3 millimetres or slot width and height of 2 millimetres is operated and maintained across the intake to ensure that fish and fish fry are prevented from passing through the intake screen.
  - b. The fish screen shall be positioned to ensure that there is unimpeded fish passage to and from the waterway and to avoid the entrapment of fish at the point of abstraction, and to minimise the risk of fish being damaged by contact with the screen face.
  - c. The fish screen shall be designed and installed to ensure that:

- i. the majority of the screen surface is oriented parallel to the direction of water flow.
  - ii. where practicable, the screen is positioned in the water column a minimum of 300 millimetres above the bed of the waterway and a minimum of one screen radius from the surface of the water.
  - iii. the approach velocity perpendicular to the face of the screen shall not exceed 0.06 metres per second if no self-cleaning mechanism exists, or 0.12 metres per second if a self-cleaning mechanism is operational.
  - iv. the sweep velocity parallel to the face of the screen shall exceed the design approach velocity.
- d. The fish screen shall be designed or supplied by a suitably qualified person who shall ensure that the design criteria specified in Condition (11)(a) –(c)(iv) of this consent is achieved. Prior to the installation of the fish screen, a report containing final design plans and illustrating how the fish screen will meet the required design criteria, and an operation and maintenance plan for the fish screen shall be provided to Environment Canterbury, Attention: RMA Compliance and Enforcement Manager.
  - e. A certificate shall be provided to Environment Canterbury by the designer or supplier of the fish screen to certify that the fish screen has been installed in accordance with the details provided to Environment Canterbury in accordance with Condition (11)(a) of this consent.
  - f. The fish screen shall be maintained in good working order. Records shall be kept of all inspections and maintenance, and those records shall be provided to Environment Canterbury upon request.

12.

- a. The consent holder shall within a period of 5 years from the commencement date of this consent, convert to spray irrigation and advise the Canterbury Regional Council as to the staging of any conversion.
- b. Any rights to continue border dyke irrigation shall cease 5 years from the date of this consent
- c. The consent holder shall advise the Canterbury Regional Council of the completion of the conversion prior to the commencement and use of the new completed spray system.
- d. For the avoidance of doubt, any conditions requiring testing as a precursor to the exercise of consent shall, with respect to the exercise of this replacement consent, occur prior to the next irrigation season following the commencement date.

### **Nutrient Loading**

- 13. For the purposes of interpretation of the conditions of this consent Bog Roy Station shall be defined as the areas in certificates of title and Pastoral Lease numbers OT2D/450 which total 2,862 hectares.
  - 14. The consent holder shall prepare once per year and not less than one month prior to the commencement of the irrigation season, an Overseer<sup>®</sup> nutrient budgeting model report, and shall prepare, at least once per year, a report of the annual farm nutrient loading for the Bog Roy Station using the model Overseer<sup>®</sup> (AgResearch model version number 5.4.3 or later).
  - 15. A copy of the report prepared in accordance with condition 14 shall be given to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, upon request.
- 16.
- a. Following conversion the consent holder shall not commence annually irrigation under this consent unless the annual (1 July to 30 June) nutrient loading (the nutrient discharge allowances (NDAs)) as estimated in accordance with condition 134 from Bog Roy Station shall not exceed 9,313 kg of Nitrogen and 116 kg of Phosphorus, unless these amounts

have been reduced by the application of a receiving water quality nutrient trigger conditions, in which case the reduced NDA shall apply.

- b. The NDAs, incorporating any reductions required by receiving water quality nutrient trigger conditions, shall be complied with from the earlier of the first full year (1 July to 30 June) following completion of the irrigation conversion or 5 years from the commencement of consent.
17. Where Overseer, or Overseer modelling, is referred for the purposes of calculating or determining compliance with the NDA limits associated with activities on the property, it shall be undertaken by an independent person with an Advanced Sustainable Nutrient Management Certificate issued by Massey University or an equivalent qualification.
- 18.
- a. The consent holder shall at all times comply with the mitigation measures set out in section 5 of the Farm Environmental Management Plans (FEMPs) for Bog Roy Station as provided to Environment Canterbury in November 2010.
  - b. Subject to condition 18(a), the consent holder shall implement, and update annually the FEMP for Bog Roy Station. The FEMP shall include
    - i. Verification of compliance with NDA's (incorporating any reductions required by receiving water quality nutrient trigger conditions) by farm nutrient modelling using the model Overseer (AgResearch model version number 5.4.3 or later).
    - ii. When undertaking the modelling outlined in Condition 14, the consent holder shall use either weather records collected on-farm or from constructed data from the nearest weather station.
    - iii. Implementation of Mandatory Good Agricultural Practices ("MGAPS") and requirements to manage in accordance with the Bog Roy Station Overseer model inputs.
    - iv. The Overseer parameter inputs report which shall be supplied to the Canterbury Regional Council.
    - v. A property specific environmental risk assessment (including a description of the risks to water quality arising from the physical layout of the property and its operation which are not factored in as an Overseer parameter) prepared by a suitably qualified person which identifies any farm specific environmental risks along with measures to mitigate the farm specific environmental risks.
    - vi. A requirement to review the risk assessment if there are any significant changes in land use practice
  - c. Detailed records shall be maintained of fertilizer application rates, types of crops (including winter feed/forage crops), cultivation methods, stock units by reference to type, breed and age, prediction of realistic crop yields that are used to determine crop requirements and all other inputs to the Overseer nutrient budgeting model.
  - d. A report on Overseer modelling shall be provided within one month of completion of the Overseer modelling by the person with the qualifications described in Condition 17 and no later than two months prior to the start of the next irrigation season to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager. The consent holder shall supply to the Canterbury Regional Council all model inputs relied upon for the annual Overseer® modelling.
  - e. Changes may be made to the Bog Roy Station Overseer model inputs, provided that written certification is provided that the change is modelled using Overseer, and that the result of that modelling demonstrates that the NDAs are not exceeded.
  - f. A copy of that certification plus a copy of the resultant Overseer parameter report shall be provided to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, prior to the implementation of that change.

## Fertiliser

19.

- a. Fertiliser shall be managed and applied in accordance with 'The Code of Practice for Nutrient Management (With Emphasis on Fertiliser Use) NZFMRA 07' or any subsequent updates.
- b. The consent holder shall keep a record of all fertiliser applications applied to the property, including fertiliser type, concentration, date and location of application, climatic conditions, mode of application and any report of the fertiliser contractor regarding the calibration of the spreader.
- c. For land based spreading of fertiliser an independent fertiliser spreading contractor shall be used to spread any fertiliser on the property except as provided for by clause (b) below.
  - i. Where an independent fertiliser spreading contractor is used the consent holder shall keep a record of the contractor used which can be supplied to the Canterbury Regional Council upon request.
  - ii. Where the applicant's own fertiliser spreaders are used, the consent holder shall test and calibrate the fertiliser spreaders at least annually, and every 5 years the fertiliser spreader will be certified by a suitably qualified person in accordance with 'The Code of Practice for Nutrient Management (With Emphasis on Fertiliser Use) NZFMRA 07' or any subsequent updates and the results of testing shall be provided to the Canterbury Regional Council upon request.
- d. Nitrogen fertiliser shall not be applied to land between 31<sup>st</sup> May and 1<sup>st</sup> September in any year except for the use of nitrification inhibitors
- e. All fertiliser brought onto the property which is not immediately applied to the land shall be stored in a covered area that incorporates all practicable measures to prevent the fertiliser entering waterways.
- f. Applications of nitrogen fertiliser shall not exceed 50 kg nitrogen / hectare per application.
- g. If liquid fertilisers, excluding liquid effluent, are stored on-site for more than three working days, the consent holder shall ensure that the fertiliser is stored in a bunded tank, at least 110% of the volume of the tank to avoid any discharge to surface or groundwater and such that it is also protected from vehicle movements.
- h. Fertiliser filling areas shall not occur within 50 metres from a water course, spring or bore.
- i. For land based spreading, fertiliser should not be applied within 20 m of a watercourse.

## Irrigation Infrastructure

20.

- a. The consent holder shall ensure that all new (not on the property at the time of commencement of this consent) irrigation infrastructure is designed and certified by a suitably qualified independent expert holding National Certificate in Irrigation Evaluation Level 4, and installed in accordance with the certified design.
  - i. Copies of certified design documents shall be provided to the Canterbury Regional Council upon request.
  - ii. All irrigation infrastructure shall be tested within 12 months of the first installation of the new irrigation infrastructure and afterwards every five years in accordance with the 'Irrigation Code of Practice and Irrigation Design Standards,

Irrigation NZ, March 2007' (code of practice) by a suitably qualified independent expert.

- iii. The expert shall prepare a report within two months of the testing, outlining their findings and shall identify any changes needed to comply with the code of practice.
  - iv. Any changes needed to comply with this code of practice shall be implemented within five years from the date of the report. A copy of the report shall be provided to the Canterbury Regional Council Attention: RMA Compliance and Enforcement Manager, within three months of the report being completed.
- b. If existing irrigation infrastructure is being used, the consent holder shall obtain an evaluation report prepared by a suitably qualified person, on the following terms:
- i. The evaluation shall determine the system's current performance in accordance with the Code of Practice for Irrigation Evaluation.
  - ii. This report shall be obtained within three months of the first exercise of the consent.
  - iii. Any recommendations identified in the report shall be implemented within five years from the date of receipt of the report.
- c. A copy of the report shall be forwarded to the Canterbury Regional Council within 3 months of the report being completed.

#### **Subdivision**

21. The NDAs shall be recalculated if there is a sale or transfer of any part, but not the whole, of the total farm area of 2862 hectares. The recalculated NDAs shall be undertaken to accurately redistribute the NDA between the resultant properties and shall replace the NDAs specified in Condition 16. The new NDAs may be recalculated on any proportionment as long as the total of all the NDAs does not exceed the NDAs of the parent title as set out in Condition 16. The recalculation of the NDAs shall be undertaken and certified using Overseer, completed and provided to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager together with a copy of the full Parameter report, within one month of the sale or transfer.

#### **Soil Management**

- 22.
- a. The consent holder shall use, where practicable, direct drilling as the principal method for establishing pastures; and
  - b. On the irrigation area the consent holder shall, where practicable, sow and irrigate all cultivated areas as soon as possible following ground disturbance.

#### **River water quality monitoring and response**

23. The water quality of the Otamatapaio River shall be monitored within 6 months of the first exercise of consent as follows:
- a. Location:
    - i. Map reference: NZMS 260 H39: 787-212 immediately upstream of all irrigation takes on Otamatapaio River
    - ii. Map reference: NZMS 260 H39: 801-244 downstream of the discharge

**Advice Note:** *The coordinates for Otamatapaio River monitoring shall be as specified unless minor changes are required to ensure that monitoring occurs upstream of all intakes and downstream of the irrigation area to appropriately monitor the localised river effects arising from the exercise of this consent.*



- b. Water quality variables monitored shall include: (a) dissolved inorganic nitrogen (b) dissolved reactive phosphorus (c) Dissolved oxygen (d) conductivity (e) turbidity; (f) periphyton biomass as chlorophyll *a* per square metre; (g) *E. coli*
- c. This monitoring may be carried out on an individual basis, or may be prepared in collaboration with other consent holders, or on a collective basis by a suitable independent body appointed by all relevant consent holders in the sub catchment.
- d. Frequency of monitoring: Once per month from 01 December to 30 April each year, with a minimum of three weeks between sampling.
- e. Methods: The methods of sampling and analysis shall be those that are generally accepted by the scientific community as appropriate for monitoring river water quality and periphyton biomass. The methods of sampling shall be documented and made available to the Canterbury Regional Council on request.
- f. The water quality monitoring shall be undertaken by a suitably qualified and/or experienced person who demonstrates that they understand the appropriate methods to use for surface water quality sampling, including preservation of samples. That person shall certify in writing that each batch of samples has been sampled and preserved in accordance with generally accepted scientific methods. A copy of those certifications and the person's qualifications shall be provided to the Canterbury Regional Council on request.
- g. The laboratory undertaking analyses shall be accredited for those analyses by International Accreditation New Zealand (IANZ) or an equivalent accreditation organisation that has Mutual Recognition Agreement with IANZ.
- h. The results of all sampling shall be provided to the Canterbury Regional Council Attention: RMA Compliance and Enforcement Manager by 30 May each year. This shall include copies of reports from the laboratory that undertook the analyses.

24.

- a. If the monitoring undertaken in accordance with condition 233 shows that the average sample result for the downstream Otamatapaio River monitoring site specified in condition 233 over the monitoring period (December to April) in any year is greater than 0.14 mg/l of DIN; or 0.006 mg/l DRP; or 90 mg chl *a*/ m<sup>2</sup> (early warning trigger) but does not exceed 0.18 mg/l of DIN; or 0.007 mg/l DRP; or 120 mg chl *a*/ m<sup>2</sup>, the consent holder shall commission a report into the cause of the breach of the early warning trigger. The report shall be prepared by an expert review panel consisting of two qualified and experienced independent scientists. One of the scientists shall be nominated by the Canterbury Regional Council, and the other shall be appointed by the consent holder.
- b. The report shall:
  - i. include the experts' conclusion on whether the exceedence(s) were as a result of natural influences, one off events, or in whole or part by nutrient loss associated with the irrigation authorised by this consent; and
  - ii. include an assessment as to whether there is likely to be a continuation of the monitored results;
  - iii. be completed by 30 July following the sampling; and
  - iv. be provided to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, by 30 August following the sampling.
- c. If both the authors of the report prepared in accordance with clauses (a) and (b) conclude, after considering all the relevant available information, including on-site monitoring, sub-catchment monitoring, and catchment resource consent compliance and audit reports made available by the Canterbury Regional Council, that the cause of the breach of the early warning trigger was unlikely to have been caused in whole or in part by nutrient loss associated with the irrigation authorised by this consent, or if the report concludes that it is unlikely that there is a trend towards exceedence of the

environmental standard trigger pertaining to the downstream Otamatapaio River monitoring site, then no further action needs to be undertaken by the consent holder, and no nutrient load reductions or Remedial Action Plan shall be required i.e., Conditions 24(d) and 24(e) shall not apply.

- d. If the monitoring undertaken in accordance with condition 23 shows that the average sample result for the downstream Otamatapaio River monitoring site, over the period December to April is greater than 0.14 mg/l of DIN; or 0.006 mg/l DRP; or 90 mg chl *a*/ m<sup>2</sup> (early warning trigger) but does not exceed 0.18 mg/l of DIN; or 0.007 mg/l DRP; or 120 mg chl *a*/ m<sup>2</sup> (environmental standard trigger), then the property nutrient load (NDA), as specified in condition 16, shall be reduced by 5% x Irrigation Proportion Factor (IPF) for the irrigation season subsequent to the monitoring period. The IPF shall be the proportion of the total authorised irrigation area developed for irrigation at the time of the exceedence under this resource consent divided by the total farm area (being 105 irrigated hectares on a total farm area of 2,862 hectares).
- e. If the monitoring undertaken in accordance with condition 23 shows that the average sample result for the downstream Otamatapaio River monitoring site, over the period December to April is greater than 0.14 mg/l of DIN; or 0.006 mg/l DRP; or 90 mg chl *a*/ m<sup>2</sup> (early warning trigger) but does not exceed 0.18 mg/l of DIN; or 0.007 mg/l DRP; or 120 mg chl *a*/ m<sup>2</sup> (environmental standard trigger), then a Remedial Action Plan shall be prepared that sets out the methods and timeframes for altering and/or adapting farm land use practices to ensure that the exceedence in the early warning trigger pertaining to the Otamatapaio River monitoring site, is returned as soon as practicable to and maintained below the average sample results of 0.14 mg/l of DIN; or 0.006 mg/l of DRP; or 90 mg chl *a*/ m<sup>2</sup> (early warning trigger) for the Otamatapaio River monitoring site, over the period December to April.
- f. The Remedial Action Plan (referred to in Condition 24(e)) shall be prepared by a suitably qualified and experienced person using Overseer or an equivalent method to demonstrate that the actions to be undertaken will achieve the necessary nutrient reductions as soon as practicable;
  - i. If the Remedial Action Plan referred to in Condition 24(e) is prepared in collaboration with other consent holders who are required to prepare a Remedial Action Plan for this sub catchment a common Remedial Action Plan shall be deemed to comply with this condition
  - ii. Any actions required by the Remedial Action Plan shall be incorporated into the consent holder's FEMP. The amended FEMP shall be implemented as soon as physically possible.
  - iii. The consent holder shall provide the Canterbury Regional Council with the Remedial Action Plan and an amended FEMP upon request.
- g. If a required reduction in nutrient load is in effect under Condition 24(d) and monitoring for that period shows that the average sample results for the Otamatapaio River monitoring site over the period December to April is less than 0.14 mg/l of DIN; or 0.006 mg/l of DRP; or 90 mg chl *a*/ m<sup>2</sup> (early warning trigger), then for the subsequent season no property NDA reduction shall be required under this condition.

25.

- (a) If the monitoring undertaken in accordance with condition 23 shows that the average sample result for the downstream Otamatapaio River monitoring site specified in condition 233 over the period December to April is greater than 0.18 mg/l of DIN; or 0.007 mg/l DRP; or 120 mg chl *a*/ m<sup>2</sup> (environmental standard trigger), the consent holder shall commission a report into the cause of the breach of the environmental standard trigger. The report shall be prepared by an expert review panel consisting of two qualified and experienced independent experts. One of the scientists is to be nominated by the Canterbury Regional Council, and the other appointed by the consent holder.
- (b) The report shall:

- i. include the experts' conclusion on whether the exceedence(s) were as a result of natural influences, one off events, or in whole or part by nutrient loss associated with the irrigation authorised by this consent; and
  - ii. include an assessment as to whether there is likely to be a continuation of the monitored results;
  - iii. be completed by 30 July following the sampling; and
  - iv. be provided to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, by 30 August following the sampling.
- (c) If both the authors of the report prepared in accordance with clauses (a) and (b) conclude, after considering all the relevant available information, including on-site monitoring, sub-catchment monitoring, and catchment resource consent compliance and audit reports made available by the Canterbury Regional Council, that the cause of the breach of the environmental standard trigger was unlikely to have been caused in whole or in part by nutrient loss associated with the irrigation authorised by this consent, then no further action needs to be undertaken by the consent holder under this condition, and no nutrient load reductions or Remedial Action Plan shall be required under this condition i.e., Conditions 25(d) and 25(e) shall not apply.
- (d) If the monitoring undertaken in accordance with condition 23 shows that the average sample result for the downstream Otamatapaio River monitoring site specified in condition 233 over the period December to April is greater than 0.18 mg/l of DIN; or 0.007 mg/l DRP; or 120 mg chl *a*/ m<sup>2</sup> (environmental standard trigger), then the property nutrient load, as specified in condition 16, shall be reduced by 10% x Irrigation Proportion Factor (IPF) for the irrigation season subsequent to the monitoring period. The IPF shall be the proportion of the area under irrigation (at the time of the exceedence) under this resource consent divided by the total farm area (being 105 irrigated hectares on a total farm area of 2,862 hectares).
- (e) If the report prepared in accordance with clauses (a) and (b) concludes that the environmental standard trigger has been exceeded because of farm land use practices, then the consent holder shall prepare a Remedial Action Plan.
- (f) The Remedial Action Plan shall set out the methods and timeframes for altering and/or adapting farm land use practices to ensure that the Otamatapaio River is maintained below the average sample results of 0.14 mg/l of DIN; or 0.006 mg/l of DRP; or 90 mg chl *a*/ m<sup>2</sup> (early warning trigger) over the period December to April.
- (g) The Remedial Action Plan shall be prepared by a suitably qualified and experienced person using approved methods, such as Overseer<sup>®</sup> to show that the actions to be undertaken will achieve the necessary nutrient reductions;
  - i. If the Remedial Action Plan outlined in clause (e) is prepared in collaboration with other consent holders who are required to prepare a Remedial Action Plan for this sub catchment the Remedial Action Plan shall be deemed to comply with this condition
  - ii. Any actions required by the Remedial Action Plan shall be incorporated into the consent holders FEMP. The amended FEMP shall be immediately implemented.
  - iii. The consent holder shall provide the Canterbury Regional Council with the Remedial Action Plan and an amended FEMP upon request.
- (h) If a required reduction in nutrient load is in effect under clause (d) and monitoring for that period shows that the average sample results for the downstream Otamatapaio River monitoring site over the period December to April is less than 0.14 mg/l of DIN; or 0.006 mg/l of DRP; or 90 mg chl *a*/ m<sup>2</sup> (early warning trigger), then for the subsequent season no property nutrient load reduction shall be required under this condition, and the full NDA for the property, as specified in condition 16 shall be restored.

#### **Lake water quality monitoring and response**

26. The water quality of the Ahuriri Arm of Lake Benmore and Lower Lake Benmore shall be monitored in accordance with this condition from the commencement of consent as follows:

- a. Locations:
  - i. Ahuriri Arm, Map reference: NZMS 260 H39:8027-2667
  - ii. Lower Lake Benmore, Map reference: NZMS 260 H39:8802-2371
- b. Depths: depth integrated 0-10m, 25m, 50m
- c. Water quality variables: (a) total nitrogen; (d) ammonia; (e) nitrate; (f) nitrite; (g) total Kjeldahl nitrogen; (h) total phosphorus; (i) dissolved reactive phosphorus; (j) Secchi disc depth; (k) chlorophyll *a*.
- d. Calculated key water quality variable: Trophic Lake Index (TLI), using the following equations:
  - i.  $TLc = 2.22 + 2.54 \log (\text{chlorophyll } a)$
  - ii.  $TLp = 0.218 + 2.92 \log (\text{total phosphorus})$
  - iii.  $TLn = -3.61 + 3.01 \log (\text{total nitrogen})$
  - iv.  $TLI = \Sigma (TLc + TLp + TLn)/3$
- e. Frequency of monitoring: Once per month from 01 December to 30 April each year, with a minimum of three weeks between sampling.
- f. Methods: The methods of sampling and analysis shall be those that are generally accepted by the scientific community as appropriate for monitoring lake water quality. The methods of sampling shall be documented and made available to the Canterbury Regional Council on request.
- g. The water quality monitoring shall be undertaken by a suitably qualified and/or experienced person that demonstrates that they understand the appropriate methods to use for lake water quality sampling, including depth integrated sampling, and preservation of samples. That person shall certify in writing that each batch of samples has been sampled and preserved in accordance with generally accepted scientific methods. A copy of those certifications and the person's qualifications shall be provided to the Canterbury Regional Council on request.
- h. The laboratory undertaking analyses shall be accredited for those analyses by International Accreditation New Zealand (IANZ) or an equivalent accreditation organisation that has Mutual Recognition Agreement with IANZ and shall be capable of analysing the variables listed in subparagraph c above with detection limits generally recognised by the scientific community as appropriate for oligotrophic lakes.
- i. The results of all sampling including the calculated average summer TLI, shall be provided to the Canterbury Regional Council Attention: RMA Compliance and Enforcement Manager by 30 May each year. This shall include copies of reports from the laboratory that undertook the analyses.

**Advice Note:** *It is anticipated that all consent holders subject to this condition would coordinate and cooperate together to ensure that the lake water quality monitoring is undertaken and the costs of that monitoring is shared between those consent holders. The Canterbury Regional Council will provide resources to facilitate that coordination and the costs of that facilitation will be recoverable from the relevant resource consent holders as a cost of supervising and administering the resource consents.*

*Any non-compliance with water quality monitoring requirements would be a matter for all relevant consent holders.*

27.

- a. If the monitoring undertaken in accordance with condition 26 shows that the average TLI for the 1 - 10 m depth integrated samples for the Ahuriri Arm site over the period December to April is greater than 2.75 (early warning trigger) but does not exceed 3.0 (environmental standard trigger), then the property nutrient loads, as specified in condition 16, shall be reduced by 5% x the Irrigation Proportion Factor (IPF) for the irrigation season subsequent to the monitoring period. The IPF shall be the proportion of the area developed for irrigation under this resource consent i.e., 105 hectares divided by the total farm area of 2,862 hectares.
- b. If the monitoring undertaken in accordance with condition 26 shows that the average TLI for the 1 - 10 m depth integrated samples for the Ahuriri Arm site over the period December to April is greater than 2.75 but does not exceed 3.0, then a report into the cause of the breach of the early warning trigger shall be prepared by a person with an appropriate post-graduate science qualification, by 30 July following the sampling. A copy of this report shall be provided to the Canterbury Regional Council Attention: RMA Compliance and Enforcement Manager, by 30 August following the sampling.
- c. If a reduction in nutrient loading is required under any part of this condition and monitoring in the period that that reduction applies shows that the average TLI for the 1 - 10 m depth integrated samples for the monitoring site over the period December to April continues to be greater than 2.75 but does not exceed 3.0 then there shall be a further property nutrient load reduction of 5% x IPF for the subsequent irrigation season.
- d. The above nutrient load reductions and investigation shall not be required if a two person expert scientist panel with one expert nominated by the Canterbury Regional Council both conclude after considering all the relevant available information including catchment resource consent compliance, FEMP compliance monitoring pertaining to this consent and audit reports made available by the Canterbury Regional Council, that the cause of the breach of the early warning trigger was unlikely to have been caused in whole or in part by nutrient loss associated with the irrigation authorised by this consent.
- e. If a required reduction in nutrient load is in effect under this condition and monitoring for that period shows that the average TLI for the 1 - 10 m depth integrated samples for the monitoring site over the period December to April is less than 2.75, then for the subsequent season the full NDA for the property, as specified in condition 16 shall be restored.
- f. If the monitoring undertaken in accordance with condition 26 shows that the average TLI for the 1 - 10 m depth integrated samples for the Ahuriri Arm monitoring site over the period December to April is greater than 3.0 (environmental standard trigger), then the property nutrient load, as specified in condition 16, shall be reduced by 10% x Irrigation Proportion Factor (IPF) for the irrigation season subsequent to the monitoring period. The IPF shall be the proportion of the area authorised for irrigation under this resource consent (105 ha) divided by the total farm area (2,862 ha).
- g. If the monitoring undertaken in accordance with condition 26 shows that the average TLI for the 1 - 10 m depth integrated samples over the period December to April is greater than 3.0 for either the Ahuriri Arm monitoring site or the Lower Benmore monitoring site, then a report into the cause of the breach of the environmental standard trigger shall be prepared by a person with an appropriate post-graduate science qualification, by 30 July following the sampling. A copy of this report shall be provided to the Canterbury Regional Council Attention: RMA Compliance and Enforcement Manager, by 30 August following the sampling.
- h. If a reduction in nutrient loading is required under any part of this condition and monitoring in the period that that reduction applies shows that the average TLI for the 1 - 10 m depth integrated samples for the Ahuriri Arm monitoring site over the period December to April continues to be greater than 3.0 then there shall be a further property nutrient load reduction of 15% x IPF for the subsequent irrigation season and rising to 20% compounding reductions for any further irrigation season
- i. The above nutrient load reductions and investigation (condition 27 (a)-(c)) shall not be required if a two person expert scientist panel with one expert nominated by the Canterbury Regional Council both agree that the cause of the breach of the

environmental standard was unlikely to have been caused in whole or in part by nutrient loss associated with the irrigation authorised by this consent.

- j. If a required reduction in nutrient load is in effect under this condition and monitoring for that period shows that the average TLI for the 1 – 10 m depth integrated samples for the Ahuriri Arm monitoring site over the period December to April is less than 3.0, then for the subsequent season no property nutrient load reduction shall be required under this condition.
28. The Canterbury Regional Council may, once per year, on any of the last 5 working days of March or July serve notice of its intention to review the conditions of this resource consent for the purposes of dealing with any adverse effect on the environment which may arise from the exercise of the resource consent and which it is appropriate to deal with at a later stage, including:
- a. dealing with any adverse effect on the environment which may arise from the exercise of this consent and which it is appropriate to deal with at a later stage; and
  - b. amending the flow in the Otamatapaio River and tributaries at which abstraction is required to be reduced or discontinued as set out in condition 5.
29. The lapsing date for the purposes of section 125 of the Resource Management Act shall be 5 years.



## APPENDIX B

### Conditions of Consent (CRC012033) – Discharge

1.
  - a. Water shall only be discharged to Lake Benmore at or about map reference NZMS H40: 801-224 as shown on the attached "Plan CRC012019 and CRC012033".
  - b. The discharge shall only be unused conveyance water and shall contain no contaminants.
  - c. Water shall only be discharged at a rate not exceeding 110 litres per second.
2.
  - a. All practicable measures shall be undertaken to avoid erosion of the bed or banks of Lake Benmore occurring as a result of the discharge.
  - b. In the event of any erosion occurring to the bed or banks of the unnamed water channel, as a result of the discharge, the consent holder shall be responsible for rectifying the situation as soon as practicable.
3. The discharge shall not occur in a manner likely to cause erosion of, or instability to, the banks or bed of Lake Benmore; or reduce the flood-carrying capacity of the waterway.
4. The discharge, after reasonable mixing, shall not cause a change in the colour or a reduction of the clarity of the receiving water body.
5. The Canterbury Regional Council may, once per year, on any of the last five working days of May or November, serve notice of its intention to review the conditions of this consent for the purposes 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 lapsing date for the purposes of section 125 shall be 5 years.

# Plan CRC012019 and CRC012033



-  **CRC012019 divert**
-  **CRC012033 discharge**