BEFORE THE CANTERBURY REGIONAL COUNCIL

IN THE MATTER OF	The Resource Management Act 1991
AND	
IN THE MATTER OF	an application by **High Country Rosehip Orchards Limited** filed under **CRC072233** for a water permit to take and use surface water from the Ohau B Canal near State Highway 8, Twizel.

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

PART B - SITE SPECIFIC DECISION

TABLE OF CONTENTS

1 INTRODUCTION

1.1 This is a decision on an application by **High Country Rosehip Orchards Limited** (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

2.1 The applicant proposes to take and use water from the Ohau B Canal near State Highway 8, Twizel. The proposed rate and volume of take is up to 208,656 cubic metres (m^3) per week and 3,000,000 m^3 per year of water, at a rate of 345 litres per second (l/s).

2.2 This water will be used for spray irrigation of up to 500 hectares (ha) of rosehips, crops, and for pasture grazing by sheep and cattle. This represents just under half of the total 1,100ha property owned by the applicant, which is made up of gently sloping land between the Twizel and Ohau Rivers. The property and the proposed irrigation area are shown in Figure 1 below.

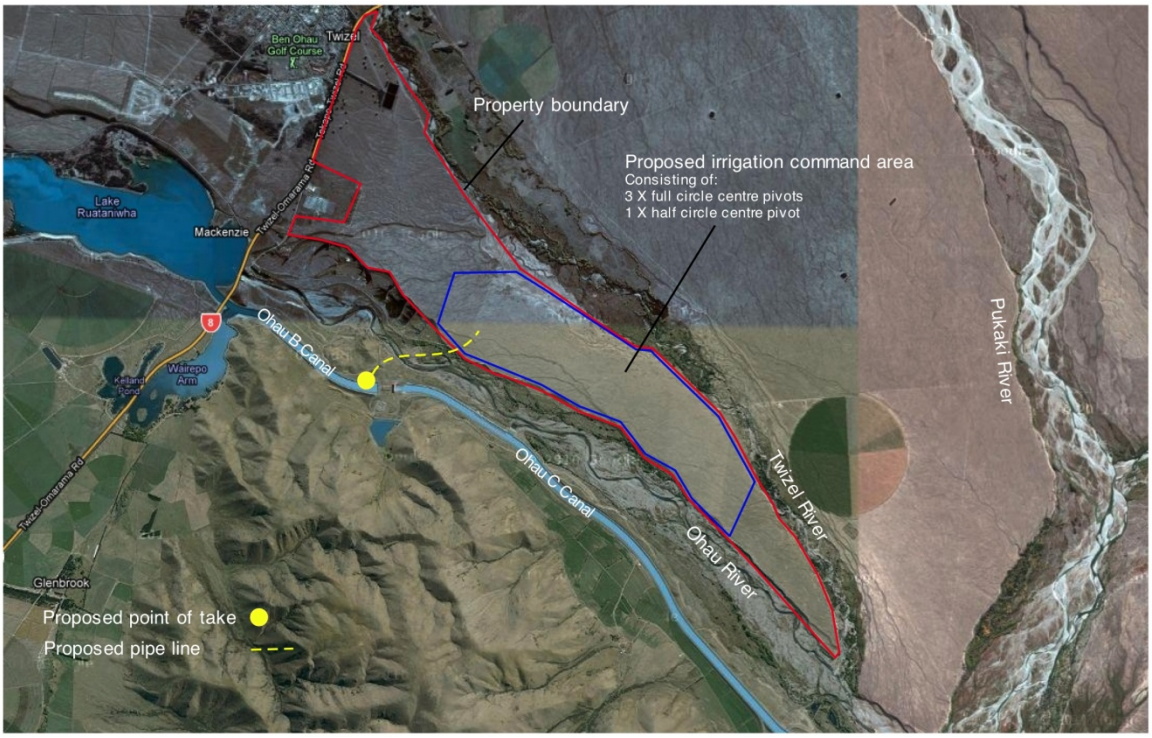

Figure 1. Aerial photo illustrating the applicant's property, proposed irrigation area and the proposed point of take in relation to the Twizel and Ohau Rivers. Note that this figure is for illustrative purposes only and the application and applicant's evidence has been used to determine the locations of the named features.

The application

2.3 The application is for a water permit to take and use surface water pursuant to section 14 of the RMA. Consent is required under the Waitaki Catchment Water Allocation Regional Plan (WCWARP), as discussed below.

2.4 The application (CRC072232) was lodged with the Canterbury Regional Council (the Council) on 29 January 2007. This application was publicly notified and there were a number of submissions that are referred to later in this decision. This water permit to take and use surface-water is for a new activity. The application requested a duration of consent until 30 April 2025.

Modifications after notification

2.5 Originally the applicant applied to irrigate up to 500 ha of land within a total command area of 895 ha. This area consisted of approximately 625 ha of land used for agricultural purposes, on the southern portion of the property and up to 270 ha of land on the northern portion of the property. The applicant proposed that this northern portion would be used for a golf course/lifestyle area.

2.6 On the 26 August 2009 (shortly after notification) they amended the proposal to limit the irrigation to the southern command area as depicted in Figure 1 above.

2.7 In correspondence dated 5 December 2008, the applicant advised the Council that a minimum lake level for Lake Ohau and Pukaki was not being proposed. The applicant suggested that the consent should be subject to the minimum lake level of Lake Ruataniwha. However, in evidence presented at the hearing, and the right of reply, the applicant confirmed that it would accept the minimum lake level of Lakes Pukaki and Ohau, as set out in Table 4 of the WCWARP.

2.8 The general principle for modifications after notification is that amendments are allowed provided they do not increase the scale or intensity of the activity or significantly alter the character or effects of the proposal. The key consideration is prejudice to other parties by allowing the change. In this case, we are satisfied that the changes do not significant alter the intensity or effects of the proposal and that no party would be adversely affected by allowing the changes.

Additional consent applications

2.9 In addition to this application, the applicant has also applied for Land Use Consent CRC072233 to disturb the bed and banks of the Ohau River for the installation of a pipeline that will lead from an intake structure in the Ohau B Canal to the proposed irrigation area. The decision on this application is provided separately.

2.10 It is noted that as the Ohau Canal is an artificial watercourse, consent is not required under Section 13 of the Resource Management Act (RMA) 1991, for the installation of the intake structure.

3 DESCRIPTION OF THE ENVIRONMENT

3.1 According to the applicant the site is currently used to grow some crops while the remainder of the area is undeveloped native barren grassland that is lightly grazed (1 SU/ha).

3.2 The Ohau B Canal, owned by Meridian Energy Limited (Meridian), is an artificial channel, which was commissioned in the mid 1980's and links Lake Ruataniwha to Lake Benmore. According to the applicant the instream values in the canal are low, however salmon are present in the canal and a salmon farm is also located within the canal.

3.3 According to the applicant, the Lower Ohau River bed, that borders the western perimeter of the applicant's property, is generally dry with only some ponded areas between Ruataniwha Dam and the confluence with the Twizel River. A labyrinth (zig zag) weir is located downstream of Ohau B PowerStation and Meridian occasionally releases water into the Ohau River via this weir. Splash flows are also released monthly into the Ohau River from Lake Ruataniwha.

3.4 There are a number of ponded areas in the Ohau River that are part of a recognised conservation area, used by the Department of Conservation (DoC) as a captive breeding centre for black stilt. This area also provides habitat and breeding areas for other birds, such as the banded dotterel, black fronted terns and wrybills.

3.5 Fish species such as brown and rainbow trout, common bully, upland bully, Chinook salmon, sockeye salmon and long finned eels have been recorded in ponded areas of the Ohau River upstream of Lake Benmore. The S42A Officer also noted that there is a DoC site on the Ohau River, adjacent to the proposed irrigation area, used as a distribution centre for the common gecko.

3.6 In terms of recreational values, the canal is used for fishing and the lower reach of the Ohau River (extending 2 km upstream of the Lake Benmore) provides opportunities for fishing and other recreational pursuits (such as jet boating, swimming, etc).

3.7 The Twizel River, bordering the eastern perimeter of the applicant's property, flows into the Lower Ohau River approximately 1.5 km upstream of Lake Benmore. The Twizel River is a popular fishing river and there is a walking track alongside it that provides public access to the river for fishing and walking. Salmonids have been recorded in the Ohau River, Twizel River and the Ohau canal.

3.8 The applicants FEMP noted that the Twizel River wetlands are located on the floodplain of the Twizel River and run along most of the eastern edge of the applicant's property. These areas have recently been turned over to DoC stewardship through the tenure review process.

3.9 The Section 42A Officer noted the Cairn Station Limited hold consents to take up to 793 l/s from the Ohau B and C canals for border dyke irrigation of 476 ha of land (CRC921927A and B). These consents expire in 2029 and are not subject to any minimum lake levels. For CRC921927A, water is abstracted from an intake structure located approximately 140 m downstream of the applicant's proposed intake.

3.10 In relation to a site visit, we detailed our site visits in Part A and we do not repeat this information here.

4 PLANNING INSTRUMENTS

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 this application 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) Mackenzie District Plan (MDP)

4.2 The provisions of these planning instruments critically inform our overall assessment of the application 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 activity, 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 application.

4.4 This application was lodged after the WCWARP was made operative. The following rules from the WCWARP are applicable to this application:

(a) Rule 3 – The applicant proposes to adopt minimum lake level of Lakes Pukaki and Ohau as set out in Table 4.

(b) Rule 6 - The activity is within the allocation limit of 275 million cubic metres for agricultural activities upstream of the Waitaki Dam.

(c) Rule 17 – Classifying rule – The proposal is classified as a discretionary activity as it complies with Rules 3 and 6.

4.5 Overall, the proposal is a **discretionary activity** under the WCWARP and resource consent is required in accordance with section 14 of the RMA.

5 NOTIFICATION AND SUBMISSIONS

5.1 The application was publicly notified on 4 August 2007 and received several submissions in response.

5.2 Table 2 is based on the relevant s42A reports and summarises those submissions that directly referenced the 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.

5.3 Overall, the key effects of concern to submitters include adverse effects on ecosystems, water quality, landscape values, and duration of consent.

Table 1. Submissions made on application CRC072232

Submitter	Reasons	Position
Meridian Energy	Effects on water quality, water metering, and duration.	Oppose
Jane Zusters (Mackenzie Guardians)	Application is deficient in its assessment of effects and applications are contrary to the RMA, CRPS and relative district plans.	Oppose
Te Rūnanga o Ngāi Tahu	Mitigation or remediation is insufficient; impacts, both Individually and collectively on cultural beliefs and values; applications are at odds with the cultural objectives of the RMA and the WCWARP.	Oppose
Department of Conservation	WQ effects on habitats, species & ecosystems; natural character, indigenous flora, fauna & threatened species; pest organism threat to freshwater habitats	Oppose

6 THE SECTION 42A REPORTS

6.1 A comprehensive officer report on the application and submissions was prepared by the Regional Council's Consents Investigating Officer (Ms Yvette Rodrigo). The report was supported by specialist reports prepared by:

(a) Mr David Stewart – hydrology (Report 2B);

(b) Mr Tom Heller – hydrology and hydro-geology (Report 4A);

(c) Dr Brent Clothier – land management (Report 4B);

(d) Mr Carl Hansen – groundwater quality (Report 4C);

(e) Dr Adrian Meredith – surface-water quality (Report 4D);

(f) Dr Michael Freeman - overview report – water quality and landscape effects (Report 4F);

(g) Mr Chris Glasson – local and cumulative landscape effects (Report 5).

6.2 The reports were pre-circulated in advance of the hearing. Specific points noted from the s42A reports are summarised below.

Canal Infrastructure

6.3 Ms Rodrigo noted that because the proposed take is from an artificial watercourse (canal) a consent is not required under Section 13 of the RMA, for the installation of the intake structure in the wall of the canal. However also noted that the application was lodged prior to the development of the NIWA Fish Screen Guidelines, and should we decide to grant consent she recommended that we include a condition to install a fish screen at the intake, which is designed in accordance with the NIWA guidelines.

Surface Water Quality

6.4 Prior to the hearing Ms Rodrigo's S42A report concluded that the impacts on water quality might be unacceptable. This was based on limited assessment of the appropriateness of the proposed mitigation methods and the implications of the applicant's NDA with the MWRL study.

6.5 Mr Heller noted all groundwater is likely to discharge to surface waters before entering Lake Benmore, with only the lower Ahuriri and lower Tekapo areas having localised groundwater discharges to the lake.

Landscape and Amenity

6.6 In his S42A Report, Mr Glasson recommended that the applicant needed to develop a significant buffer zone from SH8 and from the terraces for Ohau and Twizel Rivers in order to avoid effects on landscape. He went on to recommend that the buffer should consist of maintaining tussock land and shrubland vegetation for the area adjacent to SH8, terrace risers and top of the terraces. Mr Glasson also recommended that the applicant allows for the retention of the walkway adjacent to the Twizel River which is through an area of natural character.

6.7 Ms Rodrigo noted that evidence presented at the hearing indicated that the applicant is now not proposing to irrigate land adjacent to SH8. In addition, in Mr P Glasson's and Mr McIndoe's evidence, they stated that the proposed location of the centre pivots on the applicant's property has also changed and now irrigation is only proposed on the middle terrace rather than the lower terraces adjacent to the Twizel and Ohau Rivers. Therefore, the walkway adjacent to the Twizel River would not be affected.

6.8 Mr Glasson placed this application within his Landscape Unit 3 – Pukaki. He told us that this is a vast area of glacial outwash plains, bordered by Lake Pukaki, Simons Pass, the Grampians, and the Ohau River. In the northern part of this area, near to Lake Pukaki, the rocky and undulating moraine hills are a significant feature giving topographical relief to an otherwise flat basin landscape of river terraces and flats.

6.9 He told us that panoramic views form part of the travel experience through this Unit, with a focus not only on the expansive landscape but also on Mount Cook/Aoraki and the Southern Alps. Two scenic viewing areas (SVAs) are described in the Mackenzie District Plan as being close to the southern end of Lake Pukaki along State Highway 8. He told us lake protection areas (LPAs) exist around Lake Pukaki and the eastern side of Lake Benmore, while relevant sites of natural significance (SNS) include the Tekapo and Pukaki Rivers and parts of the Ohau River, Lake Pukaki, and the flats between Lake Pukaki and the settlement of Twizel within the Waitaki District, which borders outstanding landscape areas (OLAs), include the west side of Lake Benmore.

6.10 He told us that this Unit's landscape is most frequently appreciated from State Highway 8 and the canal roads as they weave their way across this flat to gently undulating landscape. He told us views can also be gained from the power stations of Ohau B and C; while an elevated observation point exists at the southern end of Lake Pukaki.

6.11 Mr Glasson expressed the opinion that it is a Unit that is sensitive to change because of the visibility of its vastness and open landscape, and the consistency of land cover and colour; albeit he said there is an ever increasing presence of wilding pines in the landscape unit. Modifications include, he said, irrigated areas of pastoral grassland, elements of the Upper Waitaki hydro scheme, shelter belts and woodlots, wilding pines, farm dwellings, pylons, and the settlement of Twizel.

6.12 He told us the Pukaki, Twizel and Ohau Rivers and Lake Pukaki contribute significantly to recreational pursuits and the inherent scenic and amenity values of this Unit. As well, he told us, camping facilities are found in several locations, most notably at Twizel and Lake Benmore.

6.13 He advised us the recreational value for Twizel River is high for sight-seeing, trout angling, and four-wheel driving.

6.14 He informed us that several large irrigation sites are proposed within this landscape unit at Simons Pass and adjacent to Twizel, being Rose Hips Orchards New Zealand Limited and this application. Simons Pass/Simons Hill encompasses a landscape type of outwash plains and river terraces.

6.15 Mr Glasson's comments in terms of recreational values are well supported by Mr Rob Greenaway, an expert in recreational issues for Meridian.

Cultural

6.16 Ms Rodrigo noted that Mr P Glasson outlined the consultation undertaken with representatives from Ngai Tahu and the three local runanga in his evidence. She added that Mr P Glasson had not provided confirmation that Ngai Tahu or any of the runanga consulted with are satisfied with the mitigation proposed by the applicant.

7 THE APPLICANT'S CASE

7.1 Legal counsel for the applicant, Mr Kelvin Reid, presented opening submissions and called a number of witnesses as follows:

(a) Mr Peter Glasson (project manager);

(b) Mr John Lyons (High Country Rosehip Orchard's farm manager);

(c) Mr Graham Ogle (farm management consultant/farming system models);

(d) Mr Ian McIndoe (water engineer, irrigation aspects of proposal and reasonable and efficient use);

(e) Ms Val Snow (OVERSEER modelling and OVERSEER nutrient discharge outputs);

(f) Ms Melissa Robson (senior environmental consultant, FEMPs);

(g) Dr Michael Steven (landscape);

(h) Dr Gregory Ryder (surface-water ecology and effects of nutrient discharge on the receiving environment);

(i) Mr John Kyle (planner, assessment of planning instruments relevant to the applications and conditions).

Opening legal submissions

7.2 Mr Reid introduced the proposals for Rosehip Orchard New Zealand Limited and High Country Rosehip Orchards Limited. He noted that both sites are located across the dry Pukaki River from the Pukaki Flats. They are separate proposals to irrigate areas of land between the Pukaki and Ohau Rivers. Two separate takes are proposed from the Ohau Canal. Water is conveyed by a pipeline under the Ohau River to irrigate areas of barren land on both properties via pivot irrigators.

7.3 Mr Reid then covered background matters such as the farming systems undertaken High Country Rosehip Orchard Limited and their history. He provided us information in relation to the applicant's position in relation to MWRL's Water Quality Study (the WQS). In this regard, Mr Reid's basic submission was that for High Country Rosehip Orchards, the Pukaki groundwater resource was the principal receiving environment and on the very conservative basis adopted to assess effects in relation to nitrogen discharge, there were in his view significant surpluses of assimilative capacity for the proposed farming systems.

7.4 He addressed us on the statutory framework and traversed evidence to do with effects and pointed out key findings within that evidence.

7.5 He confirmed for us the applicant's adoption of a threshold outlined in the WQS with internal adjustments pursuant to the partial sub-catchment agreement for the Pukaki groundwater zone. He told us that FEMPs for each property had been developed by Dr Robson and those FEMPs seek to address the issues of water quality and cumulative effects of nutrient losses. He told us that the farm management, monitoring and mitigation recommendations of Dr Robson are all being adopted by this applicant.

7.6 Mr Reid pointed out positive effects such as economic gains and also positive effects to do with land management. He noted that the biological systems relevant to this application are in decline. There is significant soil loss and production portions of the farm.

7.7 He then addressed us on plan provisions, referring us in detail to Mr Kyle's materials.

7.8 Focusing on water quality issues, he submitted that having regard to the explanation of the relevant policies, the policies are not directed to protection of groundwater itself but rather ensuring that land use intensification does not give rise to adverse effects in biological systems such as streams or lakes where groundwater may ultimately end up.

7.9 He also submitted that it was clear from the explanation that the proposed NRRP thresholds were set without the benefit of the detailed enquiry that we were undertaking on the basis of the detailed scientific evidence that was to be presented to us. He submitted the WQS represents a region-wide study of a scale and significance that was simply not available at the time the proposed NRRP was notified.

7.10 He also submitted that the groundwater threshold is not set at a level above which adverse effects on biological systems will occur; it is set at a level that is highly precautionary and potentially to an extreme degree. He contended that a proper effects based assessment of potential adverse effects on relevant biological systems ought to be preferred to the standard if such an assessment is available. He then went on to say, having said that, this applicant has chosen to adopt farm management practices that ensure that it will comply with this very precautionary threshold.

7.11 Mr Reid then proceeded to address us on Part 2 RMA matters. In conclusion, he told us for this applicant the applications made represent the only remaining option in their attempt to return their property to productive potential. He was of the view that the application represents the essence of sustainable management and should be granted on the conditions as sought.

7.12 As part of his submissions he provided us a table summarising the s42A officer's report and providing a response to each issue raised in that report.

Johns Lyons - Owners' submission and previous farming practices

7.13 John Lyons (Director, Rosehip Orchards NZ Limited and High Country Rosehip Orchards Ltd) explained that the applicant owns Omahau Orchard Estate that is now freehold following the completion of Tenure Review in late 2007 and comprises a total land area of 2,105.41ha.

7.14 He went on to explain that the property is bisected by the Twizel River with the land to the west of the river having resource consent to subdivide from the balance of the land (to the east of Twizel River). He informed us that the applicant is seeking consent to irrigate 500 ha of land to the west of Twizel River under centre pivot irrigation (refer Figure 1 above).

7.15 Mr Lyons explained that he is the sole director of High Country Rosehip Orchards Ltd and that the company purchased the original block of land with the view to establishing a Sweet Briar (*Rosa rubiginosa*) or 'Rosehip' Orchard industry in the Mackenzie Basin. Mr Lyons explained in detail the trials and tribulations of growing Rosehips on the property. He noted the many uses of Rosehips including herbal tea and oil for cosmetics.

7.16 Mr Lyons explained the first orchard occurred on the applicant's property by transplanting of rooted plants obtained from the natural re-growth of previously graded land in the Omarama area. After significant issues around plant growth, Crop & Food Research Ltd was engaged to assist in the process of establishing the plant.

7.17 Mr Lyons explained that over an extended timeframe it became evident that while Sweet Briar grew relatively successfully in the Mackenzie area, it was the lack of water on the broad flat land was the main limiting factor in producing successful plant growth. Consequently, for the Rosehip project to have any chance of success, irrigation was going to be a fundamental requirement.

7.18 Establishment of the first irrigated rosehip orchard commenced in 2002 using a newly established 200 ha centre pivot on the eastern side of Twizel River, with the water being sourced from groundwater. Mr Lyons explained that initial results were encouraging and that he expected the orchard to produce its first commercial crop of rosehips by year four.

7.19 Within the first two years, however, a series of issues saw the company having to replant the orchard with further rosehip seed. According to Mr Lyons these issues continued to effect the establishment of the orchard over the following three years with the company eventually conceding that the establishment of the orchard had not been successful.

7.20 Rosehip Orchards NZ Limited and High Country Rosehip Orchards Ltd are now seeking resource consent to irrigate the subject properties for a more traditional range of uses. However, Mr Lyons noted that rosehip production remains an option for the future.

Description of the proposed irrigation activity

7.21 Mr McIndoe (Principal Engineer, Aqualinc Research Limited) provided a description of the property in his evidence and details of the proposed irrigation. Mr McIndoe then provided a description of the environment including climate, soils type, surrounding water bodies and topography. Mr McIndoe added that the property is reasonably flat with a gentle slope in a south-easterly direction. The average gradient across the property ranges between approximately 5 m/km and 7 m/km.

7.22 He told us that the irrigation system would be designed so that pivots have the capacity to apply 6.0 mm/day over the irrigation area. Based on a return period of 2-5 days, the application depth will be between 12-30 mm.

Project Management

7.23 Peter Glasson (Director, SolutioNZ RM Limited) is the project manager for High Country Rosehip Orchards. Mr Glasson is also project manager for four other applicants subject to this consent process including the neighbouring Rosehip Orchards New Zealand Ltd (RONL).

7.24 Mr Glasson provided an overview of the applicant's property and the proposed irrigation scheme. Mr Glasson explained that the irrigation command area has been substantially reduced in area compared to the original resource consent application. Most notably Mr Glasson added are the removal of the potential irrigation from the command area at the northern end of the property and removal from the lower terrace adjacent to Twizel and Ohau Rivers.

7.25 In his evidence Mr Glasson outlined the consultation he had undertaken with the Council and submitters, details of which are provided in his brief of evidence.

Planning issues

7.26 Mr John Kyle (Partner, Mitchell Partnerships) provided a brief overview of the applicant's proposed water take. He acknowledged that to assess the applications in the context of the relevant assessment framework, his evidence relied on the findings and conclusions set out within the applicant's technical evidence.

7.27 In terms of the District Plan, Mr Kyle explained that the applicant's property is within the Mackenzie District. Rule 15 of the Plan sets out permitted activities in the Rural Zone of the District. In order to remain so, the various activities must comply with all of the provisions listed in Rule 15.1.1. Mr Kyle advised that the applicant's proposed irrigation plans would be able to meet the provisions of this rule.

7.28 Mr Kyle added that any effect from abstracting water from the canals primarily falls on the interests of Meridian, which operates the canal. He noted that Meridian has provided derogation approval to the applicant. Mr Kyle explained that conditions have been suggested during the consultation process with Meridian that control the way in which the various proposed intake structures will be constructed and managed in order to ensure that the operational interests of the company are not compromised.

7.29 He went on to explain that there are a number of regional planning documents that are of relevance to these proceedings. These included the Canterbury Regional Policy Statement (RPS), the WCWARP, the TRP and the Proposed NRRP. Mr Kyle outlined his view of the relevant policies and objectives from these documents and how the applicant's (including 3 other properties) proposed activities measured against these objectives and policies. He also provided comment on Part 2 (Section5-8) RMA matters related to these applications.

Water efficiency

7.30 The annual volumes of 3,000,000 m3/y applied for by the applicant is based on Mackenzie Irrigation Company share allocations of 6,000 m3/ha/year over the irrigation areas. Mr McIndoe told us that modelling showed demonstrated that the applicants require 3,849,110 m^3/year to meet full irrigation demand in eight out of ten years. Thus in Mr McIndoe's opinion the proposed takes will meet the reasonable use test.

7.31 The modelling indicated that the applicant might have insufficient water to fully meet demand more frequently than 20 % of the time. To counteract this issue Mr McIndoe said that the applicant would have to achieve an application efficiency greater than 80%. The applicant proposes soil moisture monitoring on the irrigation site to help ensure maximum possible water use efficiency is achieved.

7.32 Mr McIndoe then provided details of the potential irrigation runoff. In his view, the likelihood of ponding and irrigation runoff on the lighter Mackenzie and Larbreck soils is minimal. He added that because these soils occur adjacent to the Ohau River and the Ruataniwha Wetlands and given the gradient of the land these water bodies should not be adversely affected by any potential irrigation runoff. He also said that the buffer zone between the main channel of the Ohau River and the applicant's property (200 m) would reduce the risk of runoff entering this water body.

7.33 Mr McIndoe noted that, there are small areas of heavier Dobson and Edwards soils on the applicant's property that are a potential issue for irrigation runoff. He noted that applying smaller rates of water more frequently, and having 'boombacks' fitted to the pivots could minimize this potential runoff.

7.34 The Ruataniwha Wetlands forms part of a conservation area located near the north-western corner of the applicant's property. Mr McIndoe stated that an existing fence keeps stock out of the area. He also added the wetlands are located up gradient of the proposed irrigation area, therefore in his view, adverse effects on the wetland area relating to water quality should not occur.

7.35 Additional mitigation methods have been proposed by the applicant reduces potential runoff into the Twizel River. According to Mr McIndoe these include limiting irrigation to the top terraces, creating a buffer distance (~20 metres) between the irrigated areas and the river and carrying out regular inspections for ponding and potential runoff. Mr McIndoe stated that if runoff becomes an issue, mitigation, through fitting a variable depth irrigation system and if necessary turning sprinklers off when they pass over a problem area, would be implemented.

7.36 Mr McIndoe noted that stockwater has not been included in the applicant's consent application. He added that a separate application would be lodged by the applicant for the take and use of water for stock and domestic supply, if this application is granted and progressed by the applicant.

7.37 Mr McIndoe then outlined the potential effects on other surface water uses of the Ohau B canal. He commented that given the applicant's proposed minimum lake level (Lake Ruataniwha at the time Mr McIndoe submitted his evidence) and fish screen, the effects on the other two users will be minimal. We note that subsequent to Mr McIndoe presenting his evidence, the applicant has accepted the minimum lake levels for Ohau and Pukaki Lakes.

Groundwater

Effects on Groundwater Levels

7.38 Mr McIndoe identified that irrigation on the applicant's property has the potential to increase groundwater levels via drainage through the soil profile. He noted that there is currently no irrigation on the Ohau flat and that groundwater is likely to be sourced from: Leakage from Lake Ruataniwha; deep groundwater flow from upland catchments; gains from or losses to rivers and streams and recharge from rain fall and snowmelt.

7.39 Mr McIndoe drew on the findings of the Aqualinc (2008) Report that estimated dryland drainage in this area to be in the order of 80-200 mm/year, depending on soil type. He expected that drainage under irrigation would increase to 170-300 mm/year due to additional rainfall drainage and irrigation losses.

7.40 On this assumption Mr McIndoe calculated that an additional 1.1 Mm3/year of drainage to groundwater would occur over the Twizel and Ohau Flats (from the applicants and Rosehip Orchards New Zealand Limited (RONL) proposed irrigation). Applying a number of theoretical assumptions Mr McIndoe calculated a rise of groundwater levels of 1 m could occur over the irrigated area. He noted that in practice, groundwater systems are self-balancing, and water levels tend to flatten out to reach a new equilibrium. Consequently, in his opinion the actual changes will be significantly less than this figure.

7.41 In spite of this, in his opinion, a maximum 1 m increase in groundwater levels will have no adverse effects on groundwater in the Twizel and Ohau Flats area. He noted that there is only one bore in the area that belongs to RONL, and is used to supply water to the existing pivot.

Effects on Groundwater and Surface Water Quality

7.42 Mr McIndoe noted that the GHD report concluded that the majority of drainage from Twizel and Ohau Flats would go into deep groundwater and emerge in Lake Benmore. He then compared the piezometric and groundwater chemistry measurements with those of Simons Hill and Simons Pass. He told us that these measurements show that when Meridian is spilling water from Lake Pukaki, groundwater levels along the river rise, indicating a movement of water from the river into shallow groundwater and vice-versa when they are not spilling. Mr McIndoe was of the view that if Meridian spills water down the Ohau River, the same effect would occur.

7.43 Based on the piezometric contour map generated in the GHD report, groundwater on the applicant's property appears to be moving primarily towards the Ohau River rather than the Twizel River. Mr McIndoe acknowledged that they could not predict how much of that groundwater is entering the Twizel River and Lower Ohau River.

7.44 Mr McIndoe said that the GHD groundwater report also illustrated that the Twizel River between the Pukaki Canal (at Lake Poaka) and its confluence with the Ohau River is gaining flow from groundwater. However according to him it was not clear where the gains occurred and whether the river is gaining in the vicinity of the applicant's property. Mr McIndoe noted that the report did not identify the Ohau River as gaining flow.

7.45 Mr McIndoe stated that he is not aware of any actual flow gauging having been carried out to determine whether the Ohau River (in its lower reach) or the lower Twizel River are gaining flow from groundwater. Without further data, he could not rule out the possibility that groundwater from the applicant's property is reaching the lower Twizel and Ohau Rivers. However, he noted that the GHD modelling and the additional fieldwork carried out for the Tekapo River indicated little flow could be attributed to groundwater.

7.46 On that basis, Mr McIndoe concluded that it is possible that there is little gain from groundwater in this area and that Lake Benmore is the main receiving environment. Mr McIndoe said that further fieldwork would be required to clarify this issue.

7.47 Mr McIndoe then made a number of recommendations in his evidence on proposed mitigation methods to limit the effects on surface and groundwater quality and quantity.

Farm Environmental Management Plan (FEMP)

7.48 Dr Melissa Robson (Environmental Scientist, Ryder Consulting Limited) presented evidence on the applicants' Farm Environmental Management Plan (FEMP). Dr Robson's evidence on the purpose and development of FEMPs was covered in Part A of this decision and will not be repeated here. Only evidence specific to High Country Rosehip Orchards is considered in this section.

7.49 Dr Robson provided a description of the proposed irrigation areas in relation to the surrounding water bodies and their associated ecology. She explained the results of the applicant's OVERSEER® modelling in relation to the WQS derived nutrient threshold and noted that the applicant's property's Nutrient Discharge Allowance (NDA) was within the thresholds set by the WQS. The one exception to this was the modelled lucerne option, which is marginally over its NDA for phosphorus. Dr Robson recommended that further modelling of the lucerne option be carried that includes additional P loss mitigation measures. It is noted that the OVERSEER® model was run in 'highly developed' mode for the applicant's sheep and beef scenarios but not for the proposed lucerne option.

7.50 Dr Robson said that a sub-catchment agreement had been proposed to reallocate part of the applicant's NDA to Simons Hill/Simons Pass Stations. This will allow the applicant (and Rosehip Orchards Limited) to have a degree of flexibility in their proposed farming systems.

7.51 Dr Robson and Mr Reid outlined the details of the agreement. Dr Robson stated that under the proposal the applicant could reallocate a maximum of 4.1 kg N/ha (for 500 ha) from the sub-catchment. This 4.1 kg N/ha will include 3.1 kg N/ha that will be met by Simons Hill/Simons Pass stations buffer between their modelled OVERSEER losses and their NDA's and the assimilative capacity in the system for the Twizel surface water node at 1 kg N/ha.

7.52 Dr Robson then described the proposed farming systems for the applicant's property and the proposed mitigation methods, environmental monitoring programme and FEMP auditing process. Our consideration of the proposed mitigation, monitoring and auditing identified in the FEMP is discussed below.

7.53 The Farm Environmental Management Plan (FEMP) was tabled in November 2009 and described High Country Rosehip Orchard Station as comprising of 880 ha of flat country and has very low intensity sheep grazing and recently an area leased for dryland arable cropping. The area proposed to be irrigated is on the main outwash plain and consists of Mackenzie soils. Mackenzie soils are described as predominantly shallow and stony and excessively to somewhat excessively well drained, and are characterized by sandy loam to very stony loamy sand top soils and B horizons over very stony sand C horizons below 30 cm.

7.54 The irrigated area of High Country Rosehip Orchards Station, according to the WQS, lies in the Pukaki/Twizel surface water sub-catchment and in the Pukaki groundwater sub- catchment.

7.55 The WQS calculated that the Pukaki Groundwater thresholds are the most restrictive for N and there are no required reductions for P. These mitigation requirements cap High Country Rosehip Orchards Station's nutrient discharges at 5,923 kg N and 288 kg P per annum.

7.56 The local receiving environments for High Country Rosehip Orchards Station that are not considered in the WQS are the riverine wetland areas on the property boundary, both west and east (Ohau and Twizel River wetlands, respectively).

7.57 The Ohau River wetland is on the lower terrace of the Ohau River close to the Ruataniwha spillway beyond the western boundary of the property. Based on GHD groundwater maps (see evidence of McIndoe) the FEMP states that land use activity on the irrigated areas is unlikely to impact on this area. The Twizel River wetlands are located on the floodplain of the Twizel River and run along most of the eastern edge of the property. There was no assessment in the FEMP whether land use activity on the irrigated areas would impact upon these wetlands.

7.58 The FEMP also discussed the reallocation of NDA amongst stations contributing to the Pukaki groundwater sub-catchment. In this memorandum amongst stations it was agreed that a reallocation will occur to enable all applicants to have a degree of flexibility in their proposed farming systems. In this case, High Country Rosehip Orchards Station was reallocated a maximum of 4.1 kg N/ha (for the 500 ha irrigated area) from the sub-catchment. This 4.1 kg N encompassed 3.1 kg N/ha required for groundwater (which will be met by other stations' cushion between their modelled nutrient losses and their NDAs), and 1 kg N/ha for the Twizel surface water node). Using this reallocation gives a revised threshold of 7973 kg N/y and 297 kg P/y. Table 4 in the FEMP showed that only by using this reallocated NDA, could the station meet its NDA for SBIFIN (intensive sheep and beef finishing) using the highly developed setting. We note that APSIM was used for the lucerne option using conservative inputs but that the modelling showed it did not meet its NDA with respect to phosphorus.

7.59 Site specific risks deemed to be high as a consequence of the change in land use by the author of the FEMP included the soil phosphorus status becoming too high (Olsen P of 25) under lucerne, and unintended fertiliser application to the lower terraces (both systems), the encroachment of stock onto wet and wetland soils on the lower terraces, and soils being left bare over winter after a fodder crop has been grazed (SBIFIN). Specific measures (such as Olsen P to be maintained <25) were proposed to mitigate these risks.

7.60 The FEMP described each of the alternative land use options proposed by the applicant, and the mitigation measures specific to that land use. These measures included:

(a) Soil Olsen P levels to be maintained at or below 25;

(b) No fertiliser to be applied to the lower terraces;

(c) Ephemeral channel should be maintained under grass;

(d) Early re-grassing after kale crop as a priority;

(e) Stock to be restricted from lower terraces when soil conditions are wet;

(f) Stock units reduced over winter;

(g) Stock restricted from any open irrigation races;

(h) When flowing, stock to be removed or restricted from ephemeral channels;

(i) No stock fed out on the lower terraces of the property

7.61 The monitoring measures proposed in the FEMP included surface water monitoring (nitrogen and phosphorus) at the entry and exit of the Twizel River alongside the property. However we note that a "significant change in water quality across the property only instigated a root cause analysis, and no specific changes to farm operations. We note that no specific changes to farm operations were proposed in response to any of the proposed monitoring measures.

Farm Systems Modelling

7.62 Graeme Ogle (Manager, Farmax Limited) explained that he was requested by the applicant to develop a farm model that was built to represent the most likely uses of the proposed irrigation area. The purpose of the model was to define what systems including livestock numbers, livestock policies, supplementary feeding regimes, crop rotations, and farm production would be feasible on the proposed irrigated area. A description of the methodology Mr Ogle used for his proposal can be found in our Decisions on the Simon's Hill Station Limited and Simon's Pass Station Limited applications.

7.63 Three potential farm systems were modelled for the applicant's farm. The systems were:

(a) Lamb finishing, bull finishing and dairy grazing farm (SBFIN);

(b) Intensive Lamb finishing, bull finishing and dairy grazing farm (SBIFIN); and,

(c) Lucerne production with lamb grazing and some cropping (Crop 15)

7.64 Mr Ogle noted that the applicant's proposed area irrigation comprised of Mackenzie soils, which he inspected and noted that they are deeper and contain more soil and less stones than those on the eastern side of the Pukaki River (Simons Hill and Simons Pass). Based on the system modelled, Mr Ogle estimated that the applicant's property could support: 3.4 stock units/ha (Crop15), 18.1 stock units/ha (SBFIN) and 20.3 stock units/ha (SBIFIN).

OVERSEER® modelling

7.65 Dr Snow presented evidence relating to how OVERSEER® (in combination with other models) was used by MWRL in the Water Quality Study (WQS). We considered this evidence in Part A of our decision, and we do not intend to traverse the same issues here. Rather, we consider here the specific evidence Dr Snow presented on behalf of High Country Rosehip Orchards Limited, which have a direct bearing on our decision on this consent.

7.66 Dr Snow advised that the farm systems modelled for the applicant were lucerne (Luc), Lamb finishing, bull finishing and dairy grazing farm (SBFIN) and Intensive lamb finishing, bull finishing and dairy grazing farm (SBIFIN). The SBFIN and SBIFIN were both run in developed and highly developed modes. The lucerne option could only be run in developed mode using the APSIM model, as OVERSEER is not capable of modelling lucerne.

7.67 One weakness of APSIM, Dr Snow told us, is that it does not have a highly devolved setting. Dr Snow explained that this weakness is addressed by taking environmentally conservative assumptions. Dr Snow said these conservative assumptions are known to over-estimate the nutrient losses for the lucerne system.

7.68 In Table 3 of Dr Snow's evidence the predicted N losses for the sheep and beef scenario, over the applicant's entire property, ranged from 7,220 (standard) to 7,720 (intensive) kg N/year using the highly developed setting. For the applicant's proposed Lucerne crop the N loss were predicted as 5,720 kg per year for the entire property.

7.69 Dr Snow reiterated that she was of the opinion that OVERSEER® is underestimating nutrient losses from some of the particularly shallow soils in the Basin. Using the 'Highly Developed' option in OVERSEER, she explained, has mitigated this weakness.

7.70 Dr Snow emphasized that the modelling methodology used was environmentally conservative but that this conservatism does not lessen the need for the applicant to undertake best management practice and monitoring.

Landscape

7.71 Dr Michael Steven (Landscape Architect and Planner, Vivian and Espie Ltd) provided two briefs of evidence at the hearing. The first brief related to five separate properties being Simons Pass Station, Simons Hill Station, Rosehip Orchards New Zealand, Lone Star Farms and the applicant's. General landscape issues that relate to the wider Mackenzie Basin and these properties were addresses in this brief. A large portion of this evidence has been discussed in the Part A Decision and it is not our intention to repeat this evidence here. Notwithstanding this any specific evidence from the first brief pertaining to High Country Rosehip Orchards has been included in this summary where applicable.

7.72 The second brief of evidence addressed property specific issues relating to the landscape effects that are likely to arise as a consequence of granting the proposed irrigation consents. Simons Pass Station, Simons Hill Station, RONL and the applicant's property where all included in this brief. This site-specific evidence makes up the majority of the evidence detailed below.

7.73 Dr Steven stated that this evidence is concerned with the effects and issues arising from the application of water to the subject land, and not the taking of water.

<u>The Proposed Irrigation Area and its Landscape Context</u>

7.74 Dr Steven provided an overview of the proposed irrigation. He noted that significant areas within the lower terrace would now remain un-irrigated, including land adjacent to the Twizel and Ohau rivers. He added that the upper terrace in the northwest of the site, adjacent to SH8 has also been excluded from irrigation.

7.75 The vegetation of the site has been highly modified from its original indigenous grassland cover according to Dr Steven. He added that the site displays the characteristic signs of degradation that are evident on fluvio-glacial outwash plains elsewhere within the basin, particularly Hieracium infestation and bare soil. The upper terrace, adjacent to State Highway 8 (SH8) features significant infrastructure developments, including the Twizel wastewater treatment station, a major electricity substation, and high voltage transmission lines.

7.76 Dr Steven also noted that the upper terrace of the property (adjacent to SH8) is subject to a resource consent application to Mackenzie District Council for the development of a rural-residential subdivision. If consent is granted and the subdivision is developed, this development will lie between SH8 and the area proposed for irrigation.

7.77 In Dr Steven's opinion the application site and much of the floor of the Mackenzie Basin cannot reasonably be considered a highly natural landscape in the biophysical sense of the term, although it does contain unmodified physical elements of naturalness. In particular he noted that the applicant's site has been subject to a range of modifications to natural vegetation, including arable cropping and an attempt to establish an extensive orchard of rosehips. He considered the natural character of the application site spans the range from Moderate-Low — Moderate — Moderate-High.

7.78 The natural character of the Twizel and Ohau Rivers has been subject to modification according to Dr Steven. Within the portion of river that abuts the applicant' site Dr Steven considered that the Twizel River can be regarded as having a significantly higher level of naturalness than the Ohau River due to its natural flow.

7.79 He went on to acknowledge that the proposed irrigation area could be considered to be within the margins of these rivers and be regarded as falling within the scope of Section 6(a) of the RMA

(preservation of natural character of the coastal, wetland, lakes and rivers environments). Based on the vertical separation from the site and current agricultural development on the terraces in Dr Steven's opinion the proposed irrigation terraces contribute nothing towards what remains of the natural character of the rivers and their immediate margins. Consequently, in Dr Steven's opinion the proposed irrigation areas fall outside of the scope of S6 (a) of the RMA.

7.80 In terms of the site being regarded as an ONL Dr Steven noted that the naturalness and natural vegetation communities of the site have been modified by decades of agricultural development. Closer to SH8, the naturalness of the site is irredeemably compromised by utilities and infrastructure development. Dr Steven said that he would not rate the landscape as seen from these locations as outstanding in terms of aesthetic characteristics and qualities.

Associated Built Infrastructure

7.81 Dr Steven acknowledged that it is likely that the intensification of agricultural production will bring with it the need for further built infrastructure such as farm utility buildings. The nature, number and location of any future structures are dependent upon the particular farm production models that are adopted following the granting of irrigation consents. However, given the extent of built infrastructure development within the adjacent landscape, the distance from SH8 and the proposed subdivision on the upper terrace of the same property, Dr Steven did not regard the prospect of additional built infrastructure as necessarily leading to adverse effects.

Assessment of Landscape and Visual Effects

Visibility

7.82 Dr Steven stated that the application site proposed for irrigation is some distance removed from SH8, is on a lower terrace, and is reasonably well screened from SH8 by mature amenity planting. The proposed irrigation site is also separated from SH8 by significant infrastructure including the Twizel wastewater treatment plant, the Transpower substation and a high voltage transmission line.

7.83 Dr Steven said that a roughly formed, gravel 4WD track within the Ohau Riverbed on the true left of the river affords fishing access to the Ohau River, and its confluence with the Twizel and Tekapo Rivers. Dr Steven acknowledged that over short sections along the Ohau River this track climbs out of the riverbed and runs along the edge of the terrace proposed for irrigation. He added that the irrigated land would be visible within the immediate foreground of views, but for very limited sections of the track.

7.84 Dr Steven also noted that the application site would be visible from parts of the riverbed and from a public walking track along the edge of the terrace above the true right of the river. He added that the arc of the pivots will approach the public walking track and the overall centre pivot scheme will be highly visible to recreational users of the track and Twizel River bed.

Effects on landscape

7.85 Dr Steven's views on the effects of irrigation on components of the landscape (naturalness, natural science factors, aesthetic attributes, and colour) at High Country Rosehip Orchards were nearly identical to those he expressed with respect to Simons Hill. Only the site-specific aspects of his evidence are covered here.

7.86 The terrace landforms of the applicant's property are characteristic of the locality, and while subject to little modification, Dr Steven stated that he was unaware of the physical landscape having any particular natural science significance.

7.87 While the braided watercourses and associated wetlands of the Twizel and Ohau Rivers are of natural science significance as bird habitat (particularly for black stilt), these areas are Crown land. Dr Steven noted that land along the margins of the rivers that were previously part of the applicant's pastoral lease have been put into conservation land through the tenure review process.

7.88 Dr Steven acknowledged that the addition of centre pivot irrigators would also increase landscape complexity. However, an increase in complexity will be from a base that is low in overall landscape complexity, and according to Dr Steven would still be well within the range of complexity considered necessary for the perception of visual quality. Furthermore, Dr Steven

added, in views such as from above the Ohau B power station he considered the presence of the centre pivot structures would be almost imperceptible.

7.89 Given the relative remoteness of the application site from public viewing areas, particularly SH8, Dr Steven did not regard the proposed irrigation of HCRO as being a contributor to cumulative effects. The site is scarcely visible at all according to Dr Steven, and will not be seen either sequentially or cumulatively with other irrigation sites.

Response to S42A Officer's Reports

7.90 To address the mitigation of effects is, in Dr Steven's view, to accept the premise underlying both Mr Chris Glasson's (S42A Officer for Landscape Effects) and Ms Rodrigo's (S42A Investigating Officer) reports that there are adverse landscape and visual effects that require mitigation. In general terms Dr Steven stated he does not agree that this is necessarily the case. However, he provided the following comments in regards to the Section 42A officers report and proposed mitigation measures.

7.91 In regards to Mr C Glasson's comments that the effects of undertaking irrigation in a 'spotty and discontinuous manner', Dr Steven noted that he addressed this in his general evidence (Part A Decision). In conclusion, he finds any such effects to be more 'imagined' than real and therefore, in his view, require no mitigation.

7.92 Dr Steven acknowledged that Mr Glasson's opinion is that the absence of an extensive buffer between the Twizel and Ohau Rivers and the proposed irrigation area will cause significant adverse landscape effects that require mitigation. Mr Glasson's proposed buffer between the Ohau River and irrigated land is unnecessary in Dr Steven's opinion. The terrace proposed for irrigation is raised above the level of the Ohau riverbed, and the terrace escarpment separating the two levels is a significant buffer in itself. He added that in views from the vicinity of the Ohau B power station, the Ohau riverbed itself also performs the function of a natural buffer.

7.93 Dr Steven then referred to photos of his and Mr Glasson's, which in his view illustrates the Ohau riverbed and terrace escarpment provides a sufficient visual buffer. Dr Stevens added that Mr Glasson's simulation also indicated the insignificance of the effects of the irrigated terrace relative to the scale of the landscape. In Dr Steven's opinion there is no effect that even needs 'buffering'.

The Twizel River Trail

7.94 Dr Steven stated that while the track is in close proximity to land that is proposed for irrigation he does not regard exposure of trail users to irrigated pasture as an adverse effect. He further noted that east of Pivot 4, the track again rises from the lower river terrace onto the farmed terrace, but by this stage the track has passed the area to be irrigated. In Dr Steven's view the locations at which the pivot irrigators approach the trail will be separated by sections of un-irrigated areas that will maintain a significant distance between trail users and irrigated land.

7.95 Dr Steven added that his understanding is that the trail alignment was negotiated with the Department of Conservation on the understanding that the terrace was to be irrigated. Furthermore, while the Twizel River retains a relatively high degree of naturalness, the trail is within walking distance of the Twizel town centre. Given the proximity to Twizel, and despite the fact that an element of wildness prevails within the riverbed, he does not consider it plausible that users of this trail undertake the walk in the expectation that they will be participating in a 'back-country' experience.

7.96 Furthermore, Dr Steven added that apart from Mr Glasson's failure to acknowledge the fact that the experience provided by the trail is rural in nature; his statement does not acknowledge that many trail users will likely find the operation of centre pivots a matter of considerable interest and even aesthetic appreciation.

7.97 Where the trail is aligned within the applicant's property, Dr Steven advised that the applicant accepts that the pivots should not extend across the trail. Beyond these measures, Dr Steven did not consider it justified to propose a further buffer distance between the track and irrigated farmland.

7.98 At paragraph 95 of her S42A report Ms Rodrigo opines that Section 6(b) of the RMA is a relevant consideration, given that the irrigation proposal will change the visual aesthetics of the landscape in an area of high amenity. Dr Steven reiterated that in his view that applicant's site couldn't be

regarded as being part of an outstanding natural landscape as it fails the test for both naturalness and significance. In his opinion there are no Section 6(b) issues involved in the consideration of this application.

Dr Gregory Ryder – Water quality and Instream Ecology

7.99 Dr Ryder noted that the water quality information available for water bodies surrounding the applicant's site showed that water quality in the Ohau canal, Lake Ruataniwha/canal outlet, and Twizel River was generally high, with nutrient levels often lower than laboratory detection limits. He added that water quality was generally well within all relevant guidelines (lake-fed waterways in case of the canal and Lake Ruataniwha outlet) and recreational guidelines in case of Twizel River). He noted that the canal and outlet water quality met the water quality standards in the NRRP (incorporating the December 2010 changes).

7.100 Indicator bacteria (E. coli) levels at SH8 (Twizel River) were generally low and below guideline levels for recreational waters, which in Dr Ryder's opinion indicated little runoff from upstream farmland. Nutrient levels for nitrogen and phosphorus were generally low at all three sites monitored with levels often lower than laboratory detection limits. Dr Ryder noted that the long term monitoring by ECan indicates water quality in the Twizel River has not changed significantly since 2005, with nutrient concentrations remaining consistently low.

Aquatic Ecology

7.101 The invasive algae *Didymosphenia geminata* (didymo) was first identified in the Twizel River and the lower Ohau River in May 2006. Dr Ryder observed during his survey that large didymo mats were present throughout the Ohau River, with less obvious mats in the lower Twizel River. He also observed filamentous algae (other than didymo) throughout the lower Twizel River, with several side channels and seepages containing extensive cover.

7.102 Dr Brian Coffey, as part of the MWRL study, surveyed periphyton cover at several sites in the Twizel River in April 2008 and 2009. According to Dr Ryder, the cover of algal mats and long filamentous algae averaged over the whole stream reach were well below periphyton cover guidelines at all sites in the Twizel River, except in the lower Twizel River in April 2008. At this time cover of filamentous algae greater than 2cm long exceeded MfE guideline levels (30%) and those recommended for 'Spring fed – Upland' streams by ECan (10%).

7.103 Dr Coffey did not assess algal biomass (only cover) in his 2008 survey, so Dr Ryder has calculated predicted chlorophyll a levels for Coffey's data using the logarithmic equation derived by the Council from the Ministry for the Environment (MfE) guideline data. According to Dr Ryder the predicted chlorophyll a levels also exceeded MfE guideline levels (50 and 120 mg/m2) and those recommended by the Council (50 mg/m2).

7.104 In April 2009 Dr Coffey assessed algal biomass (ash free dry mass) in the upper, middle and lower reaches of the Twizel River. In this survey algal biomass was considerably lower than MfE guidelines at all three Twizel River sites, with average biomass less than 3 g/m2 (compared to the guideline level of 35 g/m2).

Macroinvertebrates

7.105 In terms of macroinvertebrates Dr Ryder expected benthic invertebrate communities in Ohau B Canal would be comprised of similar species to those found in local lake environments, dominated by snails, midges and worms.

7.106 Dr Ryder noted that Dr Coffey's sampling of macroinvertebrates was undertaken in the upper and middle reaches of the Twizel River. This sampling found very high quality communities with high diversity, dominated by mayflies, and with community health indices indicative of 'good' to 'excellent' biotic health.

7.107 These results are consistent with the Council's regular state of the environment monitoring data from SH8 according to Dr Ryder. Dr Coffey also found lower quality invertebrate communities in the lower reaches of the Twizel river, with communities increasingly dominated by midge larvae, and community health indices indicative of 'fair' to 'good' biotic health.

7.108 Dr Ryder explained that his own sampling in October 2009 in the lower Twizel River, near the confluence with the Ohau River, also found poor quality communities. He noted that sandfly and midge larvae dominated the macroinvertebrate community, with low numbers of high quality invertebrates (e.g. mayflies) being present.

Fish

7.109 Dr Ryder stated the New Zealand Freshwater Fish Database (NZFFD), lists eight fish species as being previously identified in waterways adjacent to the applicant's proposed irrigation area. Six species are native; being bignose (galaxiid), koaro, lowland longjaw and Canterbury koaro, upland bullies and longfin eels and two species are introduced being brown and rainbow trout. He added that Fish and Game have reported spawning sockeye salmon throughout the Ohau and Twizel Rivers.

7.110 Dr Ryder acknowledged that bignose and lowland longjaw galaxias have been found in small springs and backwaters on the terraces of the Ohau River. These springs are adjacent to wetlands maintained by DOC as black stilt habitat. He noted that DOC classifies Bignose galaxias as in 'Gradual Decline', whereas lowland longjaw galaxias are classified as 'Nationally Critical'.

7.111 There are no reports of fisheries surveys in Ohau B Canal. However, Dr Ryder expected the fish community is comprised of similar species as in Lake Ruataniwha, which would be dominated by salmon and trout with some bullies.

7.112 Dr Ryder noted that brown and rainbow trout and Chinook and sockeye salmon present in Lake Benmore use spawning grounds in the Ohau and Twizel rivers. In New Zealand, sockeye salmon are only found in the Waitaki River catchment, where they are landlocked due to hydroelectric dams. Historically, spawning runs have been small. However, Dr Ryder told us that in recent years several thousand fish have been observed in the Ohau River, with lower numbers in the Twizel River. Furthermore, Dr Ryder acknowledged that spawning in the Ohau River has been observed adjacent to High Country Rosehip Orchard.

Potential Effects on Aquatic Ecology

7.113 The proposed rate of water take from Ohau B Canal is 345 l/s. Being an artificial and regulated channel constructed for power generation, Dr Ryder noted that the canal generally supports low aquatic values. He therefore considered the proposed take would have no measurable or meaningful effect on the level or ecological values of the canal.

7.114 As there are no permanent waterways within the proposed irrigation area, Dr Ryder considered the effects of installing the proposed irrigation system on aquatic values would be less than minor. Dr Ryder noted that the WQS thresholds set the level at or above which the ecological response to increased nutrients would generate potentially more than minor adverse effects relative to current conditions (a 25% increase of periphyton biomass).

7.115 Such an approach is reasonable in Dr Ryder's opinion given the existing status of local waterways and the likely ecological effects of an increase in periphyton biomass in these waterbodies. He added that a 25% increase in maximum periphyton biomass over existing levels would be unlikely to result in significant changes to the macroinvertebrate and fish communities in these particular streams.

7.116 Dr Ryder added that groundwater modelling by GHD shows flow directions towards the Ohau River. Therefore, provided the proposed buffer zones are provided, the applicant's proposed irrigation should have no adverse effects on the water quality of the Twizel River.

<u>Recommended Aquatic Mitigation Methods</u>

7.117 Dr Ryder noted that Dr Robson had provided details in her evidence on the NDA for each property. She had also included additional proposed mitigation measures and how they would be implemented on the applicant's station. Provided these measures are undertaken, Dr Ryder expected changes to water quality to be acceptable and effects of the applicant's proposed development on local aquatic ecosystems to be no more than minor.

7.118 As there are no permanent waterways in the proposed irrigation area, and the Ohau and Twizel riverbeds are located well away from the proposed irrigation area, Dr Ryder's opinion was that riparian management is not required to protect waterways.

7.119 Threatened galaxiids are present in habitat adjacent to the applicant's property. Dr Ryder noted that DOC had expressed concern about the effects of irrigation and associated farming intensification on the water quality of the galaxiids habitat. Assessment of ground water direction and quality suggested, in his opinion, that the irrigation proposal will not have significant adverse effects on these habitats. However Dr Ryder acknowledged that there is some risk that the proposal will affect water quality of these areas and there is opportunity to mitigate this potential adverse affect. Dr Ryder explained that this could be undertaken by enhancement of habitat, either of local wetlands or through off site mitigation of habitat elsewhere.

7.120 Dr Ryder stated that discussions with Peter Ravenscroft (DOC, Dunedin) revealed the aquatic plant *Mimulus* (monkey musk) has smothered suitable habitat for galaxiids near the 'black stilt wetland'. There is however, the potential to clear Mimulus from suitable habitat although this would be an ongoing operation. Dr Ryder noted that it has been suggested potential mitigation could be in the form of monetary input from farmers for habitat restoration and maintenance.

8 SUBMITTERS

8.1 Set out below is the summary of the issues raised by submitters who appeared before us. In this case, as was common in all applications, most of the submitters who appeared before us opposed the application for various reasons or sought imposition of various conditions.

8.2 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.

Meridian Energy Limited– Groundwater, Water Quality & Canal Infrastructure

Mr Peter Callendar

8.3 In his evidence Mr Peter Callander (Hydrogeologist, Pattle Delamore Partners Limited) representing Meridian acknowledged that Mr McIndoe had identified possible migration pathways into the Twizel River, via shallow groundwater, from the applicant's property. He added that in his view the natural orientation of the underlying strata would result in a horizontal groundwater flow. As such, under these conditions, the most likely flow path for nutrients in drainage water will be lateral at shallow depths.

8.4 Consequently, Mr Callander noted, this drainage water could contribute to surface waterways that receive a contribution of their flow from groundwater. He stated that, in his view, this was the case of the Ohau River and potentially the Twizel River. He added that (based on the Pukaki River) good hydraulic connection existed between all rivers in the vicinity of the applicant's property.

8.5 Mr Callander noted that Mr McIndoe's evidence identified gains in the flow in the Twizel River and lower Ohau River and that he also accepted that there is uncertainty to how much groundwater contribution there may be. Mr Callander suggested that any sections of the river that are currently gaining flow from groundwater are likely to receive an increased groundwater flow as a result of irrigation. He stated that this would be caused by extra groundwater recharge and raised groundwater levels.

Mr Turner

8.6 In his evidence Mr Turner (Planning Manager – Natural Resources, Meridian Energy) noted that Meridian still had concerns regarding the effects of the applicant's irrigation on water quality in the Lower Ohau River and Lake Benmore

8.7 Mr Turner also advised the Meridian have included additional conditions on their derogation approval for applicants (including High Country Rosehip) wishing to take from the canals. These conditions relate to the ceasing of abstraction when required by Meridian for operational reasons or when Meridian has stopped flows in the canals. Mr Turner recommended that the Panel included these conditions on the consents, if granted.

8.8 Mr Turner also identified that there is discrepancies between the applicant's proposed consent conditions and those common consent conditions agreed with Meridian prior to derogation approval being acquired. Mr Turner's evidence acknowledged that a number of applications from this hearing contain these discrepancies.

Department of Conservation - Aquatic Ecology

Mr David Murray

8.9 In his evidence Mr David Murray (Department of Conservation) briefly described the project 'River Recovery' that has been actively developed and maintained to create wetland habitats for species that have been adversely affected by hydro-electric development. He explained that this included the Ruataniwha Wetland adjacent to the applicant's property.

Mr Richard Allibone

8.10 Richard Allibone (Department of Conservation) agreed with Dr Ryder that the proposed take from the canals would be of low impact on aquatic flora and fauna. He added that these artificial environments contain a limited range of low quality invertebrates and are inhabited by more common native fish species such as common bully and, in his opinion, the proposed takes represent very low risk of direct impacts on threatened fauna.

8.11 Dr Allibone noted that galaxiid species prey upon mayflies, generally *Deleatidium*, and that changes in water quality that lead to reduction in Deleatidium, will have a secondary effect of reducing the preferred prey of all the galaxiids. This issue, in his opinion is a critical consideration for areas where bignose galaxias and lowland longjaws exist downstream of irrigation command areas because the small body size of these fish means they have a limited size range of prey items. He told us that the specialist mouth shape of the lowland longjaw indicates a specialised feeding behaviour that could be disrupted by the loss of key prey items.

Mr Peter Ravenscroft

8.12 Mr Peter Ravenscroft (Department of Conservation) noted that the lowland longjaw galaxias (longjaw) is New Zealand's most threatened indigenous fish, being ranked as 'Nationally Critical'. He added that the longjaw have been recorded at five locations in the Upper Waitaki catchment including the Ruataniwha wetland, just 'up-gradient' of the applicant's proposed irrigation area.

8.13 According to Mr Ravenscroft, the hyporheic zone (within the substrate of streams and rivers and the point of interaction with groundwater) is important, as it is where the longjaw seeks refuge, feeds, and spawns. Mr Ravenscroft noted that the loss of the corridor to the hyporheic zone by an increase in periphyton, macrophytes or sedimentation levels has the potential to cause the localised extinction of this species.

Mackenzie Guardians – Landscape and Terrestrial Ecology

Ms Anne Stevens

8.14 Anne Stevens (Landscape Architect) representing the Mackenzie Guardians noted that elevated panoramic views of the Basin floor in the Twizel-Pukaki area could be observed from the walking track up the northern flanks of the Benmore Range. She added from here the basin floor forms an impressive, broadly homogenous and natural looking foreground to expansive views of the Southern Alps and Lake Pukaki. She noted that the applicant's proposed irrigation site forms part of this natural looking basin floor.

Ms Di Lucas

8.15 Di Lucas (Landscape Architect, Lucas Associates Limited) also representing the Mackenzie Guardians noted that the site lies between the Twizel River and Ohau Canal. She said that the proposed irrigation area could be viewed from SH8 at the Ohau crossing as well as being overviewed from an accessible location at the Falston Road junction and the roading and lookouts associated with Ohau Power Station. According to Ms Lucas, the highly visible site is evident as part of the greater outwash system that defines the basin floor. Consequently the irrigation proposal would devalue and detract from the greater outstanding natural landscape.

8.16 In Ms Lucas's view, Mr Glasson's (Section 42A expert) proposed buffering adjacent to highways and rivers was inadequate, as the landscape integrity would remain adversely affected. In her opinion the application would have significant adverse effects on the natural science, legibility and aesthetic values of the Pukaki system and should be declined.

Dr Susan Walker

8.17 In her specific site evidence, Dr Susan Walker (Plant Ecologist, Landcare Research, representing the Mackenzie Guardians) noted that the proposed irrigation is adjacent to a RAP site (Tekapo/Pukaki and Ohau Riverbeds) and a SSWI and WERI. She added that the wide braided alluvial riverbeds adjacent to the applicant's site provided important habitat for waterfowl, waders, passerines and aquatic and terrestrial insect fauna.

Ngai Tahu – Cultural

Mr Paul Hogan

8.19 In his evidence Mr Paul Hogan stated that Ngai Tahu are opposed to the applicant's proposal (including 6 other applications) because of the potential for these proposals to significantly degrade the Lower Tekapo River and the Haldon Arm of Lake Benmore. He noted that these are important locations from which to trap migratory Longfin Eel as a part of the Trap and Transfer Programme.The recommendations of the Cultural Impact Assessment (page 61) include "Priorities of Ngai Tahu", amongst which there is reference to protecting the many small aquatic resources in the Mackenzie Basin. The Twizel River is one of a number of rivers and streams named as a 'priority'. The point of this recommendation is that the tributaries to the mahinga kai enhancement areas, such as the Haldon Arm, should be managed consistently with the values required to support mahinga kai values.

9 UPDATES TO THE SECTION 42A REPORTS

Surface water quality

9.1 Ms Rodrigo noted changes in the application. The applicant had originally proposed to irrigate 500 hectares of land within a command area of 895 hectares, consisting of 625 hectares in the southern portion of the site (which was to be used for agricultural purposes) and 270 hectares in the northern portion of the site (which was to be used as a golf course/lifestyle area). She noted the applicant is now only proposing to irrigate 500 hectares of land within the southern command area.

9.2 In her S42A addendum, Ms Rodrigo noted that the applicant had provided a draft FEMP and water quality assessment. She added that the Council's technical expert had audited this FEMP and had stated there are still some uncertainties about potential adverse effects. Council's technical expert suggested that either more information is required or strict monitoring and response conditions would be needed to address cumulative water quality effects.

9.3 She also recorded that Mr McNae (Section 42A Officer for OVERSEER® auditing) identified a number of inputs used in the OVERSEER® model for the applicant's property that required clarification in order to confirm the validity of the results. Of highest concerns identified by Mr McNae was the high stocking rate of 20.4 RSU/ha, combined with the model using the applicant's own irrigation nutrient concentrations. Mr McNae explained that these factors would have implications on the amount of nutrient being imported into the system and conversely affect the nutrient output. This issue was subsequently resolved to Mr McNae's satisfaction

Efficient & Reasonable Use

9.4 In her S42 Addendum Ms Rodrigo had re-calculated the WQN9v2 annual volume based on irrigation of the 500 ha occurring within the southern irrigation command area. The soils in this area are light soils with a PAW of 30 mm.

9.5 The annual volume estimated by Ms Rodrigo 2 is 3,125,000 m3, which is higher than the annual volume applied for by the applicant. As the application limits the maximum annual volume that may be granted, in her view the annual volume applied for should be adopted.

Landscape and amenity

9.6 Mr C Glasson confirmed in his S42A addendum report agreement was reached prior to the hearing with the applicant regarding the proposed mitigation measures. It is his opinion that if these measures are undertaken then the landscape and visual values of the site can be retained.

Cultural values

9.7 Ms Rodrigo noted that Mr Glasson in his evidence outlined the consultation undertaken with representatives from Ngai Tahu and three local runanga, but she noted that Mr Glasson did not provide confirmation that Ngai Tahu or any of the runanga consulted are satisfied with the mitigation proposed by the applicant. She noted she could not therefore confirm whether or not there were still remaining concerns or whether the mitigation proposed by the applicant was acceptable to these parties.

Ms Rodrigo's Conclusion

9.8 In conclusion, Ms Rodrigo still had issues in relation to the following matters:

(a) Minimum lake levels;

(b) Surface-water quality; and

(c) Cultural values.

10 APPLICANT'S RIGHT OF REPLY

Closing legal arguments

10.1 Mr Reid told us that this application for consent is placed firmly within the rubric of the MWRL case (in comparison with Simons Hill/Simons Pass who presented additional evidence and modifications to that case). As such they are committed to the adaptive management presented by MWRL (Mr Whata) at closing including:

(a) The lock-step approach to verification of the MWRL science;

(b) Further environment baseline monitoring; and

(c) A staged approach to irrigation development.

10.2 Mr Reid stated that the relevant receiving environment for HCRO for which nutrient allowances are set is the Twizel River, and because it is assumed there is a contribution of groundwater to this watercourse and the NDA limit is very restrictive. We note that Mr Reid is incorrect as it states in both the FEMP and Dr Robson's evidence that Pukaki Groundwater is the limiting environment. Indeed, if this were not the case, then there would be no basis for the proposed reallocation of NDA.

10.3 Mr Reid noted that provided the applicant removed any irrigation from the upper terrace (as they proposed) then there were no further landscape concerns by the council's s42A expert, Mr Chris Glasson. He acknowledged that landscape experts engaged by Mackenzie Guardians disagreed with both Dr Stevens and Mr Glasson, but he directed us to Dr Stevens' right of reply evidence, which corrected a number of factual inaccuracies and rebutted other concerns.

10.4 He submitted that adoption of the MWRL proposed monitoring and adaptive management conditions together with remedial action plans will ensure that "any uncertainties will pose no risk of unforeseen environmental effects".

10.5 Mr Reid emphasised the extensive consultation undertaken with Ngai Tahu and the three local runanga. In addition, he stated, the staged development proposed under the MWRL umbrella, are aimed at addressing the potential degradation of surface water bodies which are central to Ngai Tahu's concerns.

10.6 Mr Reid summarised Mr McIndoe's position with respect to the fate of drainage water from the Rosehip Properties as the "largest proportion is likely to go to deep ground water, under the Twizel and lower Ohau rivers into Lake Benmore", but that there was "acknowledged uncertainty about this issue". He directed us again to the proposed adaptive management conditions as a means of addressing this uncertainty.

Landscape

10.7 Dr Michael Steven's right of reply addressed the evidence of Di Lucas (Mackenzie Guardians) and Chris Glasson (S42A officer for landscape). In response to Ms Lucas' claims that the applicant's land is 'entirely uncultivated' Dr Steven noted that she is mistaken. He explained that as well as cultivation for cropping an area of the property was developed for the purpose of a commercial rosehip orchard.

10.8 Dr Steven stated that in contrast to Ms Lucas' claims, most of the site is not visible from SH8. He noted that the part of the property adjacent to SH8 is not proposed for irrigation and the nearest centre pivot will be some 1.5 – 2 km away from SH8.

10.9 Ms Lucas commented that the proposed mitigation methods are inadequate and the proposal would result in significant adverse effects on the natural science and aesthetic values. Dr Steven noted that Ms Lucas had provided no details on how she assessed the effects nor did she supply any data to support her position.

10.10 Dr Steven noted that Mr Glasson had said in his addendum that all irrigation will be on the higher terrace. Dr Steven noted that this is incorrect as shown on his map provided with in his evidence in chief. He then noted that Mr Glasson was satisfied (in his addendum) that the landscape and visual affects of these applications will be acceptable.

11 STATUTORY CONTEXT

11.1 The relevant statutory context for discretionary activities 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

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) Take issues

(b) Visual and landscape effects

(c) Effects on terrestrial ecology

(d) Groundwater effects

(e) Water quality and instream ecology

(f) Cultural effects

(g) Adaptive management

Take issues

12.2 There are no outstanding issues with respect to the take from the Ohau B canal. The applicant has now agreed that that the proposed take will be subject to a condition that the minimum lake levels in Lakes Pukaki and Ohau specified in Table 4 of the WCWARP will be adhered to.

Visual and landscape effects

12.3 In our Part A decision we summarised the evidence of a number of landscape experts who expressed differing views the effects that irrigation would have on visual effects. We reached some general conclusions on the issue and set out the following general approach for assessing landscape effects for individual proposals. We now move on to apply this assessment approach to the current proposal.

Existing landscape

12.4 We have earlier set out a descriptor of the existing environment as per Mr Glasson. We do think his views more than adequately capture a very useful descriptor of the existing environment. We have noted the point that State Highway 8 is a busy highway carrying tourists and travellers, and it is from State Highway 8 that this Unit's landscape is most frequently appreciated. We do accept it is a Unit that is sensitive to change because of the visibility of its vastness and open landscape and the consistency of land cover and colour. We do note the presence of man-made modifications as detailed by Mr Glasson and many other landscape experts.

Changes to landscape

12.5 The principal effect raised by the landscape experts is to do with the "greening" effect, being the change to vegetative cover over the 500 hectare site. This is the case because the irrigation infrastructure (pivots and the like) will in the main be a very considerable distance from viewing points such as State Highway 8. However, some of the site will be viewed from elevated vantage points and/or from walking tracks.

12.6 We move on to assess the significance of this change taking into account the evidence received from the various experts.

Significance of changes

12.7 A useful reference point when considering the significance of the change is how the landscape is treated in the relevant district plan. We say this because the CRPS and PCRPS provide that the entire Mackenzie Basin is an outstanding natural landscape and should be protected from inappropriate use and development. The protection should be afforded through the relevant district plan.

12.8 In relation to this particular application, the Mackenzie District Plan is the relevant district plan. Earlier, when we were referring to Mr Glasson's evidence, we identified the sites of natural significance (which include the Tekapo and Pukaki Rivers and parts of the Ohau River) which run alongside the application site.

12.9 The site is zoned Rural in terms of the Mackenzie District Plan. The Rural zone has a range of policies and objectives but in terms of landscape values Objective 3 appears to us to be the most relevant. Objective 3 of the Mackenzie District Plan seeks protection of outstanding landscape values, natural character of margins of lakes, rivers and wetlands, and of those natural processes and elements that contribute to the district's overall character and amenity. There are other policies and objectives but all appear to be, to us, in any event, relatively general in their approach. Mr Glasson was of the view that Objective 3, in particular, reinforces what he describes as the "*technical view*" that significant parts of the Mackenzie Basin have outstanding landscape values.

12.10 However, we note that Dr Steven spent a good time of his principal brief of evidence addressing his basic premise, which was the application site cannot reasonably be considered as a highly natural landscape although it does contain unmodified physical elements of naturalness. Dr Steven placed the landscape of the application site within the moderate to moderate high range scale he had prepared. He recognised levels of modification to the subject site brought about by agricultural activities. Dr Steven did note that naturalness changes will occur as a greater degree of human intervention in the landscape – a point we have already commented upon. He was of the view that these effects on naturalness will be restricted in area and will be outweighed in prominence by the prevailing naturalness of the hills and the mountains that define and contain the flat landscapes of the Basin. He was of the view, when considered in a holistic sense, the overall effects on the biophysical natural character of the Basin will be slight. We agreed with him.

12.11 In terms of "greening" we also agreed with him that changes in vegetative communities have occurred throughout rural New Zealand wherever farming is practised. Accordingly, the notion that the Mackenzie Basin or any other rural landscape is "meant to be" a particular way or colour would preclude agricultural production in its entirety. It is in the nature of agriculture to change landscapes. He noted, and we agree with him, the landscapes of agricultural production are rarely, if ever, the way they are "meant to be".

12.12 In trying to assess the greening effects we have concentrated on a site specific consideration of visual and landscape issues. We did concentrate or put weight on views that could be had from readily available public vantage points. We considered this an appropriate approach to allow us to assess visual and landscape effects.

12.13 We note that with the landscape mitigation agreed by the applicant, the s42A expert agrees that the landscape and visual affects of these applications will be acceptable. However the submitter's (Mackenzie Guardians) experts rejects both of these views, stating they are unacceptable both in terms of visual effects and the effects on specific components of landscape such as natural science values. We therefore need to make a finding on which of their contrary views we will adopt.

12.14 We agree with Dr Steven and Mr Chris Glasson that with the mitigation now proposed by the applicant (principally the decision not to irrigate the upper terrace adjacent to SH8) that the landscape and visual affects of these applications will be acceptable. We agree with Dr Steven that Ms Lucas did not provide any data or methodology to corroborate her view with respect to degradation of natural science value. Also we do not think she placed sufficient weight on the fact of the existing farming activity and previous development of the site as described earlier by Mr Lyons. In addition, the other point we took issue with her on was the subject site is only a small portion of the outwash plain she was expressing concerns for.

12.15 We agree with Ms Steven that the irrigation site could be seen from elevated vantage points (principally on walking tracks) but we are not convinced that such views would necessarily be construed as adverse in relation to other views. We acknowledge that cumulatively (with other applications we grant) the greening effect could be considered adversely by some people viewing from a vantage point, but agree with Dr Steven that it will not contribute to adverse perceptions of views experienced by most people from the floor of the basin (in which the alps dominate).

12.16 In reaching our findings, we did place weight on Dr Stevens' opinion about the broad-scale landscape and changes that are now likely to occur as a result of irrigation both, as he said, real and imagined. The key point we accepted was his view that it is necessary in his view when he said:

> "*... it is necessary to acknowledge that landscape is not a static phenomena, but rather a dynamic, evolutionary phenomena, the expression of changing social, technological, economic and environmental circumstances. The present-day landscape of the Mackenzie Basin is a product of profound changes that have occurred over the past 150 years.*"

12.17 Also, we accepted his view that farm management practices have been evolving and changing over the 100 years of extensive pastoral farming in the Mackenzie Basin. Farm management practices, changing environmental conditions, the invasion of herbaceous and woody weeds, together with rabbit infestations have led to some dire environmental outcomes. Irrigation, he noted, will result in the establishment of improved pastures and the intensification of stock production over a relatively small extent of the area of the Basin overall. The principal indicator of this change, he said, will be the greening of the flatter irrigable lands of the Basin. Land that cannot be irrigated through centre-pivot irrigators will remain unchanged by the introduction of irrigation except for the likely increase in the capacity of landowners to control the spread of wilding pines. We found ourselves largely in agreement with this evaluation.

12.18 Given the changes proposed by this applicant we, like Mr Glasson, are satisfied that issues of concern, in terms of views and amenity effects from vantage points, could now properly be described as no more than minor. We therefore consider that the proposal could proceed without compromising landscape values. However, this conclusion must be considered in combination with our findings on other issues, particularly water quality, to inform an overall evaluation as to whether consent should be granted.

12.19 In reaching our conclusions in terms of landscape values we have taken into account the potential cumulative effects of the proposal. However, our conclusion remains unchanged irrespective of whether we are considering this application in isolation or in combination with

other existing and future developments. For this reason and given our overall findings on this application we have not provided a detailed discussion on cumulative landscape effects within this Decision.

12.20 We do note that the Ohau River is recognised as a site of natural significance under the Mackenzie District Plan. We return to this issue when we undertake our s7 evaluation.

Effects on terrestrial ecology

12.21 Experts for the submitters (Dr Walker, Mr Murray) presented uncontested evidence as to the significance of the rivers, channels, and wetlands adjacent to the proposed irrigation area as habitat for waterfowl, waders, passerines and insects. They did not, however, develop their arguments to show potential cause and effect between the applicants proposed activities and degradation to that habitat. We can infer from other evidence on the potential changes to aquatic habitat, whether effects on terrestrial ecology (particularly birds) might ensue. We note Dr Walker's evidence on the effects of irrigation on rare plant species (given largely in respect to the Pukaki Flats) applies equally to the applicant's property (although Dr Walker did consider Pukaki Flats to be of greater ecological significance).

12.22 In our view, the primary driver for more than minor effects on birds and insects that roost, feed, or otherwise inhabit river channels and wetlands adjacent to the irrigation site would be through nuisance growths of periphyton, which in turn could affect aquatic invertebrates and consequently fish and birds. Whilst we cannot predict the magnitude of such an effect, if such growths were to persist then there will be a consequential effect on aquatic biodiversity and ultimately birds.

12.23 We also note the earlier evidence of Mr Lyons where he detailed for us the orchard activity in respect of the sweet briar. It appeared to us this activity was extensive and would have resulted in significant modification in terms of the terrestrial ecology of the site.

Groundwater effects

12.24 The direction and fate of drainage leaving the proposed irrigation site is the key principal issue in contention. The principal issue in contention to resolve then is whether drainage goes directly to deep groundwater and beneath the Twizel and/or Ohau Rivers as hypothesized by the applicants, or whether lateral flow towards one or both rivers is more likely.

12.25 The principal issue and contention about the direction and fate of groundwater in this case (whether it makes a significant contribution to the Twizel and/or Ohau Rivers) are very similar to those arising at Simons Hill Station and Simon's Pass Station with respect to the intersection with the Tekapo River. However, in the Simon's Hill situation, the applicants had undertaken additional groundwater studies (to that undertaken by MWRL) which, although not wholly convincing with respect to the fate of groundwater, did at least provide a basis for monitoring. In addition, Simon's Hill Station proposed a buffer zone of more than a kilometre, between the edge of the irrigation filed and the Tekapo River.

12.26 We noted Mr Heller's conclusion that there may be local groundwater discharges to Lake Benmore in the Lower Twizel, but he also did not rule out groundwater discharge to Twizel and/or Lower Ohau Rivers.

12.27 In this case we are reliant on the interpretation of piezometric contours derived from the WQS, which as noted in Part A, were based upon meagre field data. Mr McIndoe's opinion is that there is little gain from groundwater in the Twizel or Lower Ohau Rivers in this area and that Lake Benmore is the main receiving environment. However, we determined his evidence for this conclusion was not convincing and equivocal.

12.28 Mr Callander cast doubt on possible migration pathways to the Twizel River saying that drainage water (from the irrigation area) is most likely to take a lateral flow path at shallow depths, where it would most likely intersect with the Ohau and/or Twizel Rivers. Moreover, he noted, there is good hydraulic connection between the rivers in this area, and that therefore contamination in one, could contaminate others.

12.29 We acknowledge that the data upon which Mr Callander based his opinion upon is the same as that used by Mr McIndoe, i.e., it is simply expert opinion. However, from our viewpoint, this exactly illustrates the problem: there simply is not sufficient information from which to be confident the flow path of drainage water from HCRO. Given the geography of the property

between two rivers (Figure 1), our view is that we need to adopt a precautionary stance, and assume there will be significant drainage input to one or both rivers. This is the position we have taken when considering water quality effects.

Water Quality and Instream Ecology

12.30 In Part A of this decision we rejected the MWRL proposition that all consents sought in this hearing could be granted (with conditions) and without causing cumulative 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 cumulative 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 trophic state of the Haldon Arm of Lake Benmore,

(b) groundwater chemistry and in particular the proposed threshold of 1 mg/L nitrate-nitrogen (NO_3-N), and

(c) periphyton growths in the Twizel and Lower Ohau Rivers.

12.31 There are no surface waters within the proposed irrigation areas so there are no local water quality effects to consider, except the effects on the Twizel and Lower Ohau rivers that can be attributed solely to the applicant's activities.

12.32 The applicants have proposed various mitigation measures to lessen the risk of their activities contributing to cumulative water quality effects. We need to consider whether the proposed mitigation measures and adaptive management scheme are sufficient to avoid a significant water quality problem occurring, and/or whether refinements to the measures proposed are required.

12.33 The ultimate receiving water (as far as this application is concerned) is the Haldon Arm of Lake Benmore. In Part A we determined that the Haldon Arm of Lake Benmore can assimilate an increased nutrient load from the granting of consents (with mitigation) and remain within an oligotrophic state. While we did not accept the MWRL proposition as a whole (that all consents could be granted) we did accept that the proposed (MWRL) increased nutrient load from irrigation would not cause a more than a minor effect to the Haldon Arm of Lake Benmore; mainly because of the high inflows from the Ohau B canal and the concomitant relatively short residence time.

12.34 We have also accepted the proposition that effects of irrigation on groundwater may be considered minor where the NO_3-N concentration remains < 1 mg/L. This appears to be a reasonable interpretation of the PNRRP objectives for groundwater in the Mackenzie Basin, and there have been no challenges to it. No evidence on predicted groundwater concentrations was presented specific to HCRO, however, if this were our sole water quality concern it could be met through consent conditions.

12.35 As was noted by Mr McIndoe however, the purpose of the NO_3-N groundwater provisions in the PNRRP is to protect surface waters. In this regard we are of the view that there is a significant risk that the proposed irrigation of HCRO will result in nuisance growths periphyton in the Twizel River adjacent to and downstream of the applicant's property. We are also concerned about similar effects in the Lower Ohau River, but note that this river is already highly modified and does not have the same values as the Twizel.

12.36 The reasoning behind our concerns is as follows:

(a) In Part A we rejected the MWRL proposition that we should allow a 25% increase in periphyton above that calculated as the current biomass in the WQS. Apart from its arbitrary development, we are of the view that to accept the 25% increase guideline is contrary to the PNRRP; both the version at the time of this application, and the current version, which both have objectives to maintain or improve effects related to water quality, and not permit a degradation. As noted in Part A we are of the view that the MfE periphyton guidelines are applicable in the Mackenzie Basin environment and should be used.

(b) The WQS calculated that Pukaki groundwater is the most limiting environment for nutrient leached from HCRO's irrigation. If the study had used the MfE periphyton guidelines as the basis of determining whether nuisance growths of periphyton could

occur, then, in our view, it is very likely that the Twizel River would have been the limiting environment, and consequently the NDA for HCRO would have been reduced.

(c) As discussed above the groundwater evidence is equivocal, and we are not convinced that drainage water from HCRO will bypass the Twizel and/or Ohau Rivers.

(d) The evidence of Dr Coffey (MWRL) and Dr Ryder (HCRO) showed that periphyton growths in the Lower Twizel already exceed MfE guidelines on some occasions. As noted in Part A, we did not accept Dr Coffey's view that these periphyton growths are unrelated to existing irrigation activities. In the context of this application, we note that there is existing irrigation upstream of the Twizel lower node, which could explain these growths.

(e) Dr Romero's (MWRL) evidence pointed to the likelihood of phosphorus limitation in Lake Benmore, although this is with respect to phytoplankton in the lake. However, the nutrient limitation experiments of Wilks and Norton (reported in part A) showed that periphyton growth in the Twizel River was co-limited by nitrogen and phosphorus (i.e., it responded to both N and P additions). We note that under the lucerne option (potentially the more benign of the two land uses proposed by the applicant) the current NDA for P would not be met. Thus we are of the view that small increases in P additions to the Twizel River may well stimulate periphyton growth.

12.37 In his discussion on the effects of nutrient additions to streams (Mackenzie Basin in general) Dr Coffey for MWRL argued that we should not be overly concerned by increases in periphyton, and indeed said that under the regime proposed by MWRL (25% increase in maximum biomass), such increases would not be noticed. This may be a valid point if public perception were the only consideration. However this is not the case, and lower biomass values within the MfE guidelines are designed to provide protect to in-stream users, i.e. Invertebrates and fish.

12.38 Dr Ryder's evidence showed that at the Lower Twizel site high quality invertebrates (mayflies in particular) are already depleted in comparison with upstream sites. We accept the advice from Department of Conservation experts (Mr Ravenscroft and Dr Allibone) that New Zealand's most threatened indigenous fish the lowland longjaw galaxias is found in Ruataniwha wetlands, just up gradient of the applicant's property and that galaxiid species prey upon mayflies. From this we can deduce that if periphyton reaches a certain biomass, it will reduce the numbers of mayflies, which in turn will have an adverse effect on galaxiids.

12.39 We accept that Ruataniwha wetlands are up gradient of the applicant's property, and therefore may not be impacted directly, but we point out galaxiids in general are migratory, and also there are wetlands in both the Twizel and Ohau adjacent to the applicant's property, which may be habitat for longjaw. We are also conscious of Mr Ravenscroft's evidence that the hyporheic zone (within the substrate of streams and rivers and the point of interaction with groundwater) is important, as it is where the longjaw seeks refuge, feeds, and spawns.

12.40 Thus we are of the view that further proliferation of periphyton in the Lower Twizel could adversely affect this most threatened NZ freshwater fish, which in our view would be unacceptable. Effects on native fish populations in general could affect birds that feed in lower Twizel and Ohau rivers. We accept that quantifying this effect would be very difficult, but nevertheless the logic is inescapable. We note that Dr Ryder (for the applicant) appears to have accepted there is some risk to biota, by proposing monetary input from farmers for habitat restoration and maintenance and in particular proposed monkey-musk clearance in the Ruataniwha wetland.

12.41 The same can be said in relation to the applicant's evidence. We acknowledge that on some of these challenging issues there will not be evidence available that establishes issues beyond any doubt. In this application that is definitely not the case. Overall, it is a matter of judgement as to whether or not the applicant has come forward with sufficiently robust evidence in the form of opinions in relation to prediction of future effects in conjunction with adaptive management to satisfy us that the purpose of the RMA would be met by a grant. For reasons we will elaborate on later, we are not so satisfied.

Cultural

12.42 The current Ngai Tahu position is to oppose consent for HCRO, based on their perception of uncertainties surrounding aspects of the application, particularly with respect to water quality and groundwater and the likely flow-on effects to mahinga kai. The applicants, for their part have proposed a staged approach and adaptive management in order to address these uncertainties.

We need to decide whether the applicant's proposal convinces us that more than minor effects on mahinga kai can be avoided, remedied, or mitigated.

12.43 Our view is that Ngai Tahu's position with respect to HCRO, based on their perception of uncertainties surrounding water quality and groundwater and the likely flow-on effects to mahinga kai, is well-founded. As discussed above, we are of the view that there are significant risks from this application to invertebrates, and freshwater fish. While it is unlikely that increased periphyton growths would affect tuna (eel) directly, an indirect effect on the food chain cannot be discounted.

Adaptive Management

12.44 The applicants have adopted the MWRL position of overcoming some of the uncertainties raised by way of adaptive management, whereby they will develop their property in stages and only proceed where certain milestones are met (thresholds not exceeded).

12.45 As discussed in Part A we are of the view that adaptive management is not a substitute for an inadequate assessment of environmental effects. We acknowledge that an AEE can have, and will have uncertainties, and it is not incumbent on the applicant to eliminate these uncertainties. It is matter of judgement, however, as to whether an AEE adequately addresses the likely environmental effects arising from the application. In our view, by solely adopting the MWRL general AEE, the applicant has failed to address site specific issues relating to the geography and geo-hydrology of their property and the activity they propose, in relation to the Lower Twizel and Ohau Rivers, which are in close proximity.

12.46 In addition, the applicants committed to the "lock step" approach to verification of the MWRL science. The lock-step approach in essence, includes the design and implementation of a pre-irrigation monitoring programme. Simply put, if the baseline assumptions are not confirmed through this monitoring, then irrigation cannot commence.

12.47 While attractive at first blush it raised for us the question: Why should consent be granted in the circumstance where what we considered to be fundamental pre-consent research was either not completed or not completed adequately?

12.48 Our concern with this approach is that while we see the sense in the circumstances of this case of pre-irrigation monitoring, we note that, firstly, it is more than pre-irrigation monitoring; indeed, it is the design and implementation of a pre-irrigation monitoring programme.

12.49 Next, if we are to grant consent on this basis, then our view of the evidence produced there is a very real risk the applicant group would not be able to proceed beyond the pre-irrigation monitoring programme. Rather than grant a consent that could not be given effect to and which might create difficulties for both the applicant group and the consent authority, we considered it more appropriate that we recognise, through declining consent, that the applicant bears the primary responsibility of coming to a hearing with adequate information.

Key conclusions on effects

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

12.51 We agree that there are no longer "take issues" given the applicant agreed that the proposed take will be subject to the minimum lake levels in Lakes Pukaki and Ohau as specified in Table 4 WCWARP.

12.52 We are satisfied that there will not be visual amenity and landscape effects arising from a grant of consent for the application as now amended by the inclusion of the applicant's mitigation measures as supported by Mr Glasson.

12.53 We think that the main impact on terrestrial ecology would be, as we have noted earlier, through nuisance growths of periphyton, which could affect aquatic invertebrates and consequently fish and birds.

12.54 The key principal issue in contention was to do with groundwater effects and consequently water quality and instream ecology. We were faced with competing views between Mr McIndoe and Mr Callendar. For reasons we have already discussed, we prefer the views expressed by Mr Callendar in relation to groundwater flow paths. We do acknowledge that in the materials advanced by Mr McIndoe he was candid to acknowledge the dearth of sufficient information and

data so as to be confident about the flow path of drainage from High Country Rosehip Orchards. In short, we conclude Mr McIndoe did the best he could with the material he had available. However, that lack of quality data in the end, we think, countered against the proposition he advanced. So our main finding on this point is that we prefer the evidence of Mr Callendar on the issue of groundwater effects and flow; that, ultimately, the application suffers fundamentally from a lack of quality data and information to enable us to be confident about flow path of drainage water from High Country Rosehip Orchards.

12.55 Our further finding is that there is a very real risk of further proliferation of periphyton in the Lower Twizel River, which would be unacceptable. Such an outcome would have adverse effects on native fish populations, birds and the ecosystem.

12.56 The response to this circumstance put forward by the applicant was to utilise adaptive management and a stepped approach to the activity. Both adaptive management and a stepped approach would be founded in conditions of consent. However, we have reached a finding that given the consequences on the environment are so great if the adverse events we have signalled do occur and given the troubling paucity of data, we do not think this is a circumstance where adaptive management coupled with a stepped approach is inappropriate to implementing the consent.

12.57 We are of the view that the use of water for irrigation could result in more than minor effects on water quality and aquatic habitat of the Twizel River and/or the Lower Ohau River. In particular we believe that nuisance growths of periphyton that exceed MfE periphyton guidelines are likely in these watercourses, and that this would result in a decline in aquatic habitat. The applicant has, in our view, not offered sufficient mitigation that convinces us that the water quality and aquatic environment of the Twizel and Ohau Rivers will not be affected in a more than minor way.

12.58 As a consequence of the effect on water quality, we consider that granting consent to the proposal would have adverse effects on mahinga kai and cultural values.

13 EVALUATION OF RELEVANT PLANNING INSTRUMENTS

13.1 Under s104(1)(b) RMA, 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 application, 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, which are water quality, tangata whenua, environmental flow and level regimes, efficient use of water and landscape values.

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 and lakes. We have determined that granting this consent is likely to result in nuisance growths of periphyton in the Ohau and Twizel Rivers that exceed MfE periphyton guidelines and that this would result in a decline in aquatic habitat. Therefore the life supporting capacity of these water bodies will be compromised, which is contrary to Objective 1(b).

13.6 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 finding in terms of the likely results in the Ohau and Twizel rivers, then in our view granting consent would not be consistent with Objective 1(c).

13.7 We note that Objectives 2, 3, 4 and 5 'in the round' deal with and provide for the allocation of water. However, the critical qualification is that water can be allocated provided that to do so it is consistent with Objective 1. Given the findings we have made about Objective 1, we must conclude that allocating water in terms of the balance objectives would not be consistent with the overall scheme of the WCWARP. We have reached 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.

13.8 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 in the PNRRP not being achieved. As 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.

13.9 In the PNRRP (as incorporated into the WCWARP) the Ohau and Twizel Rivers were classed (water quality) 'natural' which required there to be no change from this state under Objective WQL1.1.

13.10 In the operative NRRP the Ohau River has been reclassified as 'Lake-fed' and the Twizel River is classed 'Spring-fed Upland' where it adjoins the southern half of the applicants property. Where it adjoins the northern section of the applicant's property, and its headwaters, the Twizel River is classified as 'Alpine Upland'. The operative NRRP requires that the water quality, for these rivers, be maintained to a certain standard based on their classification.

13.11 In the case of the Ohau river, the 'natural' classification was clearly inappropriate and the change to 'lake fed' allows a more permissive regime with respect to periphyton indicators (200 mg/m^3 chlorophyll A and 30% cover of river bed by filamentous algae >20mm). No data has been presented that allow us to assess whether this outcome is currently being achieved downstream of the applicants property, and hence whether it would achieve it after irrigation.

13.12 For the Twizel river the same periphyton indicators apply to both alpine -upland and spring-fed upland (50 mg/m^3 maximum chlorophyll a, and maximum 10% cover by filamentous algae > 20 mm). The evidence is this is not currently being achieved and in our view is less likely to be achieved after irrigation of the applicant's property. This is inconsistent with Objective WQL1.1.

13.13 For non-point source discharges to groundwater, Objective WQL2 of the PNRRP distinguishes between groundwater that is "*unaffected or largely unaffected by human activities*" [as reported in 2004]. While there is extremely limited groundwater quality data in the Upper Waitaki there appears to be general agreement that NO_3-N concentrations are generally low (<1 mg/l) and the WQS (#3.85d Part A) proposed a threshold of 1 mg/L NO3-nitrogen for those catchments that sit below the threshold.. Because of the importance of groundwater as a determinant of surface water quality, our view is that the 1 mg/L NO_3-Nitrogen threshold is appropriate.

13.14 We note the NRRP Objective WQL2.1(3) states that "Where groundwter enters a river of lake, the concentration of any contaminant in the groundwater shall not result in the surface water quality being reduced below the relevant provisions of Objective WQL1, or the standards set by a water conservation order." In this case there is insufficient data from which to predict maximum concentrations in groundwater and consequently whether the surface water threshold in WQL2.1(3) could be breached.

13.15 Overall then, having regard to the scheme of the WCWARP and the NRRP we reach a conclusion that granting consent in this case would not be consistent with the key objectives and policies of those plans relating to water quality.

Tangata Whenua

13.16 Objective 1(a) of the WCWARP relates to the integrity of mauri and is closely linked to Objective 1(b). If we are not satisfied that the health of a particular water body is being safeguarded then the mauri is not being safeguarded either. As noted above, we do not have confidence that even with the mitigation measures proposed by the applicant, sustainable water quality outcomes will be achieved. It therefore follows that granting the consents may not maintain the integrity of the mauri and also, will not meet the spiritual and cultural needs of the tangata whenua.

Environmental flow and level regimes

13.17 Policies 3 and 4 of the WCWARP refer to the setting of environmental flow and level regimes to achieve the objectives of the WCWARP. This is reflected in the rules of the PNRRP which specifies

minimum flows and levels for water bodies and allocation limits for specific activities. In relation to this application, the applicant proposes to comply with flow and level regimes in the WCWARP, which should ensure that the proposal is consistent with Policies 3 and 4.

Efficient use of water

13.18 Objective (4) of the WCWARP seeks to promote "*the achievement of a high level of technical efficiency in the use of allocated water".* The technical efficiency of the application is consistent with the provisions of the WCWARP. 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.

13.19 Policies 15 – 20 deal with efficient and effective use of water and are applicable to this application. The Policies provide for an efficient use of water so that net benefits are derived from its use and are maximised and waste minimised. We are satisfied that the rates and annual volumes sought by the applicant reflect an efficient and effective use of water and that the reasonable use test can be met. The proposal is compliant with Policy 16(c)(ii) which the applicants used to calculate the annual volume. Overall, we consider that the proposed irrigation will comply with the reasonable use and efficiency provisions of the WCWARP.

Landscape values

13.20 We discuss 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.

13.21 In considering these provisions, we are informed by the provisions of the Mackenzie District Plan, which identifies the applicant's property as Rural zone. Given this circumstance, a more permissible or relaxed approach to landscape issues (such as they are in the context of this application) is, we think, available to us.

13.22 For the reasons already advanced, we think that this proposal as amended the applicant during the course of the hearing results in an outcome that landscape effects of this proposal are acceptable and they are capable of being addressed by conditions that could achieve consistency with the relevant objectives and policies. However, given the finding we make on water quality which ultimately determines the outcome for these applications, we do not think it is necessary for us to advance this matter further.

Key conclusions on planning instruments

13.23 For all of the above reasons, we consider that granting the consent would be contrary to the objectives and policies of the WCWARP (incorporating the PNRRP) and the NRRP relating to water quality. As consequence of this is that the proposal would also be contrary to the objectives and policies relating to tanagta whenua values.

14 EVALUATION OF OTHER RELEVANT S104 MATTERS

14.1 Under s104(1)(c) RMA, we are required to have regard to any other matter that we consider to be relevant and reasonably necessary to determine the application. After hearing all the relevant evidence, we consider that no such matters exist in relation to this application.

15 PART 2 RMA

15.1 Section 104(1) 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 application.

Section 6 – Matters of National Importance

15.2 Sections 6 identifies matters of national importance that we must "recognise and provide for" when making our decision, including preserving the natural character of lakes and rivers (s6(a)), protecting outstanding natural features and landscapes (s6(b)) and the relationship of Maori with the environment (s6(e)).

15.3 In relation to s6(a), given our finding in relation to the adverse environmental effects, in particular, growths of periphyton of the Ohau and Twizel Rivers, we must conclude that a grant of consent would not recognise and provide for the matters in s6(a).

15.4 In respect of sub-section (e) in particular, based on these conclusions, we have determined that the application, if granted, is likely to exacerbate nuisance growths of periphyton in the Twizel River, and may do likewise in the Lower Ohau River. We have also determined that such growths are likely to impact upon the threatened longjaw galaxias and possibly other native fish. Based on these conclusions, the application fails to address the spiritual and cultural relationship that Ngai Tahu seek to maintain and or improve in respect of the waterways and ecosystems that are currently sustained in the Ohau, Twizel Rivers and downstream receiving waters of Haldon Arm. Ngai Tahu identified restoration of mahinga kai in the Haldon Arm as one of their priorities, and as a result did not want to see new irrigation that would degrade existing habitats and deny opportunities to undertake such enhancements. The proposed activity on the evidence before us has the potential to have a detrimental effect on the mahinga kai aspirations of Ngai Tahu and impact on their particular relationship and responsibility to their waters, sites and taonga values.

15.5 For the above reasons, we consider that granting consent to the proposal would not recognise and provide for sections 6(a) and 6(e), as we are required to do under the RMA.

Section 7 – Other Matters

15.6 Section 7 lists other matters that we shall "have particular regard to". Sub-sections (a), (aa), (b), (c), (d), (f) and (h) are relevant to this application.

15.7 Sub-section (a) and (aa) relate to kaitiakitanga and the ethic of stewardship respectively. The relevant cultural material provided to us through the Ngai Tahu submission (2007), the CIA (including appendices) and the Ngai Tahu evidence at the hearing including reference to on site consultations, represents the active expression of kaitiakitanga. Mr Mikaere endeavoured to assist the applicants give tangible respect to the concerns of Ngai Tahu through the development of on farm mitigation measures including FEMP's and best management practices. We do not consider that essence of Kaitiakitanga or good stewardship will be met by allowing irrigation in this location, because of the proximity of rivers and wetlands and the species that rely on them for ecosystem health. The measures outlined in the FEMP demonstrate the intention to provide good stewardship, but in our view they are not sufficiently specific to give us the confidence that the principles of good stewardship will be achieved.

15.8 In terms of section 7(b), we do agree that this application would give rise to an efficient use of water. However, in terms of section 7(c), we do not see that a grant of consent for the reasons already advanced would result in the maintenance and enhancement of amenity values, particularly of the Twizel and lower Ohau Rivers. Similarly, section 7(d) refers to intrinsic values of ecosystems, which, as outlined above will be compromised in our view.

15.9 Sub-section (f) refers to maintenance and enhancement of the quality of the environment. Our view is that this will not be achieved in streams adjacent to the proposed irrigation area. We also observe that the Ohau Rivers is recognised as a site of natural significance within the Mackenzie District Plan.

15.10 Sub-section (h) refers to protection of habitat of trout and salmon. In our view trout could be negatively impacted through the degradation of their habitat by nuisance periphyton growths, which in turn would reduce the production of species upon which trout preferentially feed (mayflies).

15.11 Having particular regard to the above matters in the context of section 7, we conclude that the grant of consent could not be supported

Section 8 – Treaty of Waitangi

15.12 There are three Papatipu Runanga with an interest in the Upper Waitaki (Te Manahuna) area, Te Runanga o Arowhenua, Te Runanga o Waihao and Te Runanga Moeraki. The iwi authority, Te Runanga o Ngai Tahu, in conjunction with the three papatipu Runanga submitted in opposition to the application and, after consultation, have not changed their position.

15.13 We acknowledge the applicants contribution toward the cost of the CIA and engagement of the cultural expert Mr Buddy Mikaere to assist the applicants identify ways to address the cultural issues arising from the irrigation proposal. Despite these efforts, the uncertainty of the WQS to

accurately predict the effects of the proposal to avoid, remedy or mitigate the effects of the proposed activity on the receiving environment fails to satisfy s.8 of the RMA.

Section 5 – Purpose of the RMA

15.14 Turning now to the overall purpose of the RMA, that is, "to promote the sustainable management of natural and physical resources".

15.15 In our view the proposal will allow the development of land at High Country Rosehip Orchards to occur, which may provide for the economic and social well-being of the community. However are not convinced that the application, if granted, will safeguard the life-supporting capacity of water ecosystems (Section 5(2)(b), and in our view the applicant has not proposed a full set of mitigation measures to "avoid, remedy or mitigate" the potential impacts of irrigation on water quality as required in Section 5(2)(c).

16 OVERALL EVALUATION

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 We find that there will be adverse effects of the activity on the environment, in particular to growths of periphyton in the Ohau and Twizel Rivers. We have also found that granting consent would be contrary to policies and objectives in the WCWARP as we have earlier identified. We are also mindful that the grant of consent will not, in our view, meet the purpose of the RMA as that purpose is embodied in section 5.

16.3 We recognise that irrigation of the subject site will provide economic benefits at both a local and national scale. The economic benefits would arise in the Mackenzie District for the applicant, primarily, and others who would benefit economically from the increase in production from the subject site. However, in our view, we should give that matter less weight than the effects on water quality that concern us, as we see that water quality effects far outweighs in terms of scale and degree and is much more significant for us in the final outcome.

16.4 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 decline consent.

17 DECISION

17.1 Pursuant to the powers delegated to us by the Canterbury Regional Council:

17.2 For all of the above reasons and pursuant to sections 104 and 104B of the Resource Management Act 1991, we **DECLINE** application CRC072233 by High Country Rosehip Orchards Limited.

DECISION DATED AT CHRISTCHURCH THIS 22ND DAY OF NOVEMBER 2011

Signed by:

Paul Rogers

Dr James Cooke

Michael Bowden

Edward Ellison