

IN THE MATTER of the Resource Management Act 1991
AND
IN THE MATTER of the hearing of submissions on Proposed Plan Change 5 (Nutrient Management and Waitaki Sub-region) to the Canterbury Land and Water Regional Plan

BY **BELLFIELD LAND CO LIMITED**

AND **GLENTANNER STATION LIMITED**

AND **HALDON STATION LIMITED**

AND **MACKNEZIE IRRIGATION COMPANY LIMITED**

AND **KILLERMONT STATION 2012 LIMITED**

AND **OMARAMA STREAM WATER USERS GROUP**

AND **TWINBURN LIMITED**

Submitters

TO **CANTERBURY REGIONAL COUNCIL**

Local authority

STATEMENT OF EVIDENCE OF KERI JOY JOHNSTON

Dated: 22 July 2016

INTRODUCTION

- 1 My name is Keri Johnston. I hold a Bachelor of Engineering in Natural Resources Engineering from the University of Canterbury. I am a Professional Member of the Institute of Professional Engineers New Zealand (MPIENZ) and a Chartered Professional Engineer (CPEng).
- 2 I also hold a certificate from Massey University for Farm Dairy Effluent Design and Management, and a national certificate (level 4) in irrigation evaluation.
- 3 Upon completion of my degree, I worked for Meridian Energy Limited as a graduate engineer, based in Manapouri and Twizel. After twelve months, I accepted a position with Environment Canterbury ("ECan") as a Consents Investigating Officer before taking on the role of Environmental Management Systems Engineer with the River Engineering Section of ECan. During my three and a half years with ECan, I was the Consents Investigating Officer for the applications associated with the Canterbury Regional Landfill at Kate Valley, and developed environmental management systems in accordance with ISO 14001 for several units within ECan.
- 4 I left ECan to join RJ Hall Civil and Environmental Consulting Limited as an Environmental Engineering Consultant. I was employed in this position for three and a half years. Work mainly involved the preparation of resource consent applications for all land and water activities, dairy conversions and engineering related works, as well as being a contract Consents Investigating Officer for applications associated with the Central Plains Water Trust and the Ashburton Community Water Trust.
- 5 Since 2007, I have been a director and principal of Irricon Resource Solutions Limited, a resource management and environmental engineering consultancy.
- 6 In preparing this evidence, I have reviewed the following material:
 - 6.1 Plan Change 5.
 - 6.2 The Section 32 report for Plan Change 5.
 - 6.3 Supporting technical documents for Plan Change 5.
 - 6.4 Submissions on Plan Change 5.
 - 6.5 The Section 42A report for Plan Change 5.

CODE OF CONDUCT

7. I have read the Code of Conduct for Expert Witnesses within the Environment Court Consolidated Practice Note 2014 and I agree to comply with that Code. This evidence is within my area of expertise, except where I state I am relying on what I have been told by another person. To the best of my knowledge I have not omitted to consider any material facts known to me that might alter or detract from the opinions I express.

SCOPE OF EVIDENCE

- 7 My evidence will provide background information on the resource consents granted following the Upper Waitaki hearings, the conditions that they are subject to and why, and how this relates to Section 15 of Plan Change 5 (PC5), and the relief sought.
- 8 I will also provide comment on the difficulties I foresee implementing Section 15 of PC5 from a practitioner's perspective.

THE UPPER WAITAKI HEARINGS

- 9 I was a consultant acting for 10 applicants who were seeking to take and use water from the Upper Waitaki Catchment, whose applications were part of a series of applications heard at a joint hearing of Commissioners appointed by ECan in 2009. As a consultancy however, we acted for 26 applicants.
- 10 Water quality was an issue right from the outset in the Upper Waitaki. To address concerns, a massive, comprehensive water quality study (WQS) being undertaken on behalf of all the applicant's seeking consent to take and use water for irrigation purposes. This was called *Cumulative Water Quality Effects of Nutrients from Agricultural Intensification in the Upper Waitaki*, and was prepared by GHD Limited.
- 11 The purpose of the study was to evaluate the potential for degradation and what the cumulative effects of such nutrient losses would be on lakes, streams and groundwater if an additional 25,000 ha were to be irrigated.
- 12 The study found that the additional irrigation could occur with some mitigation of nutrient losses required to ensure the maintenance of the environmental state of the lakes and waterways. This result of this was a comprehensive suite of water quality conditions including:
- 12.1 Nutrient discharge allowances (NDA's) for both N and P (expressed in total kg's per year).

- 12.2 River and lake water quality monitoring and responses (trigger levels set at a local level and catchment level to monitor and manage any deterioration of water quality).
 - 12.3 Implementing a Farm Environment Plan, which is audited on an annual basis, and must implement Mandatory Good Agricultural Practices (MGAP's)¹ across the property.
 - 12.4 Undertaking OVERSEER nutrient budgeting and management.
 - 12.5 Fertiliser timing restrictions.
 - 12.6 The requirement for fertiliser to be applied in accordance with the Code of Practice for Nutrient Management.
 - 12.7 Any new irrigation infrastructure is designed and certified by a suitably qualified independent expert.
 - 12.8 All irrigation infrastructure is to be tested on a regular basis in accordance with the Code of Practice for Irrigation Evaluation.
- 13 All consents, with the exception of one renewal application, were granted with an expiry date of 30 April 2025. This coincides with the expiration of the Meridian Energy and Genesis Energy hydro scheme consents, and was a requirement of the Mackenzie Irrigation Company agreement for any new consents. A copy of the conditions that these consents are subject to is attached to this evidence in Appendix One.
 - 14 Please note that each individual consent is subject to in excess of 50 conditions.
 - 15 The NDA's were determined for each property using a variety of methods, with the common methods being the NDA determined for the farm from the Water Quality Study, the NDA for the proposed farming activity, or the NDA for the current farming activity.
 - 16 Following the initial decisions on these consents, nearly all were appealed to the Environment Court. The subsequent process and mediation that took place has literally taken 'years', with consents still in the appeal process.
 - 17 Of the applicants that I represented, the length of the process varied from 8 years to 15 years. I had an applicant whose renewal application was lodged in 1998, and consent on appeal was finally issued in 2015.

¹ The term MGAP has been replaced with GMP, but it is the same concept.

18 You will hear from a number of those applicants who cannot stress with you enough the time, money, uncertainty and sheer exhaustion that resulted from the entire process, and here they are again in the Plan Change 5 process.

SECTION 15 OF PLAN CHANGE 5 (PC5)

19 There are three aspects of PC5 that concern these submitters. These are:

19.1 No protection for consented NDA's beyond PC5 becoming operative;

19.2 The TLI's set for the Ahuriri and Haldon Arms of Lake Benmore does not match those that these consent holders are subject too;

19.3 Water quality limits in Table 15B(b) are not based on actual water quality data.

Protection of the NDA's

20 The entire way through the collaborative community process, the consent holders were led to believe that because their consents had an NDA, that no other consents would be required under PC5.

21 The whole idea of the collaborative process is that if communities are engaged with the processes to identify their own values, determine the outcomes they wish to achieve, and craft the framework to enable such outcomes, the resulting rules will be more robust, achievable, and will gain greater commitment across the community. These consent holders did participate in the processes, but it is also fair to say that after having spent a considerable number of years in the Upper Waitaki consenting processes, there is a high level of "planning fatigue" in this catchment. But the one thing that these consent holders held on to was the fact that they would not have to go through another consent process again.

22 PC5, however, has not delivered on this, and in fact, has created a high level of angst for those consent holders, many of whom are yet to give effect to their consents because they have only just resolved appeals, or have been unable too because the entire consenting process was such a huge financial burden, that they are not currently in an economic position to do so. Then there are those who are well into the irrigation development phase after years of planning and dealing with the appeal process at the same time.

23 To illustrate this, I direct you to Rules 15B.5.13A (for the Ahuriri and Upper Waitaki Hill zones) and 15B.5.18A (Haldon and Mid Catchment zones). These rules permit the use land for farming subject to conditions.

- 24 Condition 3 of these rules (it is the same for both) is relevant to these consent holders and it is as follows:

The land is subject to a water permit that authorises the use of water for irrigation and;

- (a) *The permit was granted prior to 13 February 2016;*
- (b) *The permit has commenced, as specified in S116 of the RMA; and*
- (c) *The permit is subject to conditions that specify the maximum rate of nitrogen (kg/ha/yr) that may be leached from the land' and*
- (d) *The water permit is subject to conditions which require the preparation and implementation of a plan to mitigate the effects of the loss of nutrients to water.*

- 25 Clarification has been sought from the Council on clauses (a) and (b). For example, the consent may have been granted prior to 13 February 2016, but a change of conditions has been applied for subsequently, and the new consent was granted post this date. The NDA is still exactly the same, however, the date of the grant of the subsequent consent is now later than the 13 February 2016. The Council has provided assurance that these consents would still meet clause (a) of condition 3, however, the literal meaning of the condition and the specificity of the date has definitely created cause for concern.

- 26 In respect of clause (b), again, many of these consents are only just out of the appeal process, or in some cases, still coming out of the appeal process. The term "commenced" has been taken in its literal sense, in that the activity authorised by the consent must have started, and this has been impossible for many. For many properties the activity of irrigation may not have commenced but the actual development to implement the irrigation is well underway and a significant financial commitment already.

- 27 Council has again provided assurance that this clause and the reference to S116 of the RMA means that a consent commences when the time for lodging appeals against the grant of the consent expires and no appeals have been lodged; or when the Environment Court determines the appeals or all appellants withdraw their appeals, unless the consent or the Environment Court specifies a different commencement date, as opposed to the activity literally having 'commenced'.

- 28 There is also an issue with condition is clause (c). As stated earlier in this evidence, the permits are subject to NDA's, but these are specified in kg/year, not kg/ha/year as required by this clause, therefore, on technicality, this condition is not met by these consent holders.

29 Provided that all of condition 3 could be met (and as stated above, there is doubt about this), then these consent holders would be permitted, but only until a subsequent set of rules become operative. Each of these rules begins with the words “*Until rules... become operative...*”

30 Therefore, they are only permitted for the interim period between notification of PC5 and it becoming operative. Post PC5 becoming operative, these consent holders will require a land use consent to farm as a controlled activity at best.

31 With this, there is a requirement for a nitrogen loss calculation that does not exceed the nitrogen baseline until 30 June 2020. Then from 1 July 2020, the baseline GMP loss rate, unless the nitrogen baseline was lawfully exceeded and the application for resource consent demonstrates that the exceedance was lawful.

32 Section 2 of PC5 defines “nitrogen baseline” and “baseline GMP loss rate”. The inference in both of these definitions is that the calculations are done on what was actually occurring on farm between the years of 2009 and 2013. The only exemption to this is where a building consent and effluent discharge consent was obtained during that period, in which case the baseline can be assumed to be an operational dairy farm.

33 Therefore, for these consent holders, a land use consent to farm would have to be applied for, and an NDA based on the farming activity that was actually occurring between the years of 2009 and 2013. This time period is right in the throes of the consenting and appeal process. Therefore, no consideration has been given to the fact that they were not actually able to give effect to their consents during that nitrogen baseline time period.

34 It also strikes me, as a practitioner, that this would result in a water permit with an NDA on it, and a land use consent with a potentially different NDA on it, and is not in any way a sensible outcome from this plan, and for no environmental benefit.

35 It is understood that the underlying assumptions for PC5 are premised on GMP being undertaken and one valid question that could be asked is whether the NDA’s on these consents are in accordance with the principles of GMP?

36 In the technical report prepared by ECan², it is stated that:

In the Upper Waitaki, Hakataramea and other hill areas, assuming that ‘current practice is at GMP’ is not an unrealistic assumption. In December 2014, the Upper Waitaki Zone Committee requested that the technical team look into ‘what GMP means’, and whether we could quantify the benefits and costs. The memo produced (Shaw & Harris, 2014) looked into definitions of

² Environment Canterbury Technical Report – Waitaki Limit Setting Process: Technical Overview

GMP and MFM used in Variation 1 to the CLWRP, and the technical team discussed these with the Land Information Group. The conclusion was that the sheep and beef farming systems in the upper Waitaki were likely to be aligned with good management practice losses already.

37 Therefore, even those land owners not currently subject to a consented NDA and comprehensive suite of water quality conditions are likely to currently aligned with GMP.

38 However, as described earlier in this evidence, the consent holders are subject to a comprehensive suite of conditions, including the requirement for MGAP's to be implemented on the properties. MGAP's are as follows:

Mandatory good agricultural practices	What these practices mean on farm
Fertilisers applied according to code of practice for fertiliser use	The fertiliser users' code of practice aims to ensure that where fertilisers are used that they are used safely, responsibly and effectively and in a way that avoids, remedies or mitigates any adverse environmental effects. The code of practice includes guidance on fertiliser use, application, storage, transport, handling and disposal.
Use a fertiliser recommendation system (nutrient budget) and account for all sources of nutrients including applied effluents and soil reservoirs accounted for	<p>Planning fertiliser applications to all crops, determining crop requirement and accounting for soil nutrients and organic nutrient supplies, all reduce the risks of applying excessive fertiliser above the crop requirement. This maximises the economic return from the use of fertilisers and reduces the risk of causing nutrient pollution of the environment</p> <p>Accounting for all sources of nutrients including imported sources and soil reservoirs is an important management measure in all farming systems and become especially important on farms where manure is produced and applied to the land. The re-application of organic manures to land is often thought of as a disposal of a waste product, and the available nutrients within the organic manures are not accounted for. The use of an integrated nutrient budgeting tool such as OVERSEER automatically accounts for nutrients supplied in organic manures.</p>
Fertiliser application applied evenly	The even application of fertiliser is an assumption of the OVERSEER model as included in the fertiliser code of practice. Fertiliser spreaders should be tested and calibrated in-house at least annually and every 5 years by an independent auditor.
Irrigation and effluent applied evenly	The even application of water and or effluent is an assumption of the OVERSEER model. Irrigators should be tested and calibrated in-house at least annually and then every 5 years in accordance with the code of practice for irrigation evaluation by a qualified irrigation auditor.
Crop, cultivation, nutrient inputs and yield records kept per farm management unit	Maintaining good crop input records is important for:

Mandatory good agricultural practices	What these practices mean on farm
	<ul style="list-style-type: none"> • The calculation of cumulative annual organic fertiliser applications and also their contribution to long term nutrient supply; • The prediction of realistic crop yields that are used to determine crop requirements; • Providing accurate inputs to the OVERSEER nutrient budgeting model that is being used here as a proxy for measuring diffuse nutrient losses.
Good design of irrigation systems	Design will match soil properties and low application amounts on shallower soil to prevent summer drainage.
Robust irrigation scheduling	Good irrigation scheduling to prevent summer drainage.
Supplement and feeding out management	To be addressed in the Farm Environmental Risk Assessment.
Winter grazing management	To be addressed in the Farm Environmental Risk Assessment.

39 MGAP's alone are comprehensive and most certainly align, if not go further than, the Industry Agreed Good Management Practices.

40 Therefore, these consent holders are currently required to be operated at a standard of better than GMP, and are subject to consented nutrient limits for both N and P.

41 Therefore, there seems to be no good reason why the use of land for farming activities by these consent holders should not be permitted beyond PC5 becoming operative.

42 Therefore, the relief sought is as follows. The changes have been tracked for ease.

Rule 15B.5.13A

Until Rules 5.43A, 5.46A, 15B.5.14 to 15B.5.18 become operative in accordance with clause 20 of Schedule 1 to the Resource Management Act 1991, The use of land for a farming activity within the Ahuriri Zone and Upper Waitaki Hill Zone is a permitted activity, provided the following applicable condition is met:

1. Until Rules 5.43A, 5.46A, 15B.5.14 to 15B.5.18 become operative in accordance with clause 20 of Schedule 1 to the Resource Management Act 1991, the nitrogen loss calculation from a farming activity on a property greater than 10 hectares does not exceed the average nitrogen loss that occurred between 1 January 2011 and 31 December 2015, or the nitrogen baseline, whichever is greater; or

2. The nitrogen loss from the farming activity is managed under a resource consent that is held by an irrigation scheme or principal water supplier and the resource consent contains conditions which limit the maximum rate or amount of nitrogen that may be leached from the subject land; or

3. The land is subject to a water permit that authorises the use of water for irrigation; and

(a) the permit was first granted prior to 13 February 2016; and

(b) the permit has commenced, in accordance with section 116 of the Resource Management Act (1991); and

(c) the permit is subject to conditions that specify the maximum rate of nitrogen (~~kg/ha/yr~~) that may be leached from the land; and

(d) the water permit is subject to conditions which require the preparation and implementation of a plan to mitigate the effects of the loss of nutrients to water.

Rule 15B.5.18A

~~Until Rules 5.53A, 5.54A, 15B.5.19 to 15B.5.23 become operative in accordance with clause 20 of Schedule 1 to the Resource Management Act 1991, The use of land for a farming activity within the Haldon Zone or Mid Catchment Hill Zone is a permitted activity, provided the following applicable condition is met:~~

1. Until Rules 5.53A, 5.54A, 15B.5.19 to 15B.5.23 become operative in accordance with clause 20 of Schedule 1 to the Resource Management Act 1991, the nitrogen loss calculation from a farming activity on a property greater than 10 hectares does not exceed the average nitrogen loss that occurred between 1 January 2011 and 31 December 2015, or the nitrogen baseline, whichever is greater; or

2. The nitrogen loss from the farming activity is managed under a resource consent that is held by an irrigation scheme or principal water supplier and the resource consent contains conditions which limit the maximum rate or amount of nitrogen that may be leached from the subject land; or

3. The land is subject to a water permit that authorises the use of water for irrigation; and

~~(a) the permit was granted prior to 13 February 2016; and~~

~~(b) the permit has commenced, in accordance with section 116 of the Resource Management Act (1991); and~~

~~(c) the permit is subject to conditions that specify the maximum rate of nitrogen (~~kg/ha/yr~~) that may be leached from the land; and~~

~~(d) the water permit is subject to conditions which require the preparation and implementation of a plan to mitigate the effects of the loss of nutrients to water.~~

New Policy – required for these consents upon their renewal

Consider granting applications for resource consent in the Upper Waitaki Freshwater Management Unit to exceed the nitrogen baseline where:

(a) the land is subject to a water permit that authorises the use of water for irrigation purposes; and

(b) the water permit is subject to conditions that specify the maximum rate of nitrogen that may be leached from the land.

LAKE BENMORE TLI'S – TABLE 15B(d)

43 Table 15B(d) of Plan Change 5 sets water quality limits for lakes. For the Ahuriri Arm of Lake Benmore, the TLI is 2.9 and for the Haldon Arm of Lake Benmore, the TLI is 2.7.

44 One of the conditions that NDA consent holders are subject to is a lake TLI on either the Ahuriri Arm or Haldon Arm of Lake Benmore (depending on where the property is located). For the Ahuriri Arm and Haldon Arm of Lake Benmore, the early warning trigger on the consents (i.e. a response is required) is a TLI of 2.75.

45 Therefore, there is a “mismatch” between the plan TLI's and the consented TLI's for the Ahuriri and Haldon Arms of Lake Benmore.

46 In the case of the Ahuriri Arm, the consented TLI is more restrictive, and the consent holders would have to enacted the requirements of the early warning trigger when others in the catchment would be able to carry on.

47 In the case of the Haldon Arm, the consented TLI s slightly more favourable that the plan TLI. However, these submitters seek to make it 'fair for all', but are concerned that TLI's derived from a comprehensive consenting process have not been carried over to PC5.

48 Given this, there are two relief pathways open to the Council. The first is to amend the TLI's in Table 15B(d) to align with the consented values of 2.75 for the Ahuriri and Haldon Arms of Lake Benmore.

49 The second is the insertion of a new policy that allows the consent holders a straight forward consenting pathway to change the consented TLI's to align with the TLI's in Table 15B(d). Possible wording for such a policy is as follows:

Any water permit holder who is subject to conditions that specify a TLI on either the Ahuriri Arm or Haldon Arm of Lake Benmore, may seek a change of consent conditions under S127 of the Resource Management Act, to alter the TLI on their permit, to accord with the TLI in Table 15B(d)

of Section 15, Plan Change 5, Water Quality Limits for Lakes in the Upper Waitaki Freshwater Management Unit.

50 In the case of the Haldon Arm, the evidence of Dr. Greg Ryder concludes that there is no effect on Lake Benmore from changing the TLI from 2.75 to 2.7.

51 For the Ahuriri Arm, the plan limit is higher than the consented TLI, and therefore, it can only be concluded that allowing the consent holders to come up to this limit will have no environmental effect. In the reverse situation, and the plan is aligned to the consented TLI, then that is more restrictive than the plan at present.

RIVER WATER QUALITY LIMITS – TABLE 15B(c)

52 The consent holders are subject to stream water quality limits as conditions of their consent. The limits were based on those in the NRRP at the time for the water body type.

53 However, inherent in the conditions is the requirement to establish a baseline water quality prior to irrigation commencing. Irricon commenced baseline water quality sampling for our clients in 2012 (while the appeal process was being undertaken) so that once appeals were resolved, the consent holders could get underway straight away as the baseline water quality monitoring conditions had already been satisfied.

54 This has highlighted the fact that some of the water quality limits set in conditions are already being exceeded, even without irrigation having commenced. One example of this is the Omarama Stream, and Mrs. Wendy Parsons alludes to this in her evidence.

55 In the evidence of Dr. Greg Ryder, he has also identified that there are inconsistencies between the water quality limits for rivers in Table 15B(c) of Plan Change 5 and those that the consent holders are subject too. However, the issue in this case, is not just specific to the 'numbers', but also the parameters themselves, for example, nitrate-nitrogen in the plan versus DIN in consent conditions. It is noted that many consent holders are subject to limits on waterbodies that don't even feature in Table 15B(c) of Plan Change 5, such as the Otamatapaio River and Stony Creek.

56 This inconsistency is an issue that needs to be addressed by the Council. At the very least, a consenting pathway also needs to be provided in Plan Change 5 to allow consent holders to align their consent conditions with the water quality limits in the plan. Alternatively, the plan water quality limits need to be updated to reflect actual water quality data.

57 Should a consent pathway be provided for, this will require the insertion of a new policy that allows the consent holders a straight forward consenting pathway to change the

river water quality limits to align with those in Table 15B(c). Possible wording for such a policy is as follows:

Any water permit holder who is subject to conditions that specify river water quality limits, may seek a change of consent conditions under S127 of the Resource Management Act, to alter the limits on their permit, to accord with the limits in Table 15B(c) of Section 15, Plan Change 5, Water Quality Limits for Lakes in the Upper Waitaki Freshwater Management Unit.

IMPLEMENTATION ISSUES WITH PC5 FROM A PRACTITIONERS POINT OF VIEW

58 I am not a planner, however, I believe that with my experience, that I have a greater understanding of these issues than most, and am well-used to reading and absorbing plans and rules on a regular basis.

59 I have been involved with numerous planning and consenting processes. This has included analysing plan provisions, writing submissions, appearing at hearings, and having a good understanding of consent conditions, as well as national level over-arching planning documents. This includes Plan Changes 2 and 3 to the Waitaki Catchment Water Allocation Regional Plan, Plan Change 6A to the Otago Water Plan, the development of the original LWRP, Plan Changes 3 and 4 to the LWRP, and the Upper and Lower Waitaki consenting processes.

60 In my statement of evidence for the Waitaki Irrigators Collective, I outlined the implementation issues with Lower Waitaki rule framework of PC5. The Upper Waitaki rule framework is no exception, and if at all possible, is even more complex.

61 It is my view that the plan has not delivered what it was expected too in terms of ease of use, but my biggest concern with this plan is that it creates totally unnecessary consenting.

62 I can see no sense in requiring any land owner to go through a consent process when there is absolutely no benefit to the environment from them doing so. This is very much the case for consent holders in the Upper Waitaki that hold water permits that not only restrict the maximum amount of N and P that can be leached, but also water quality conditions that require comprehensive monitoring and reporting, and to farm in a manner that undoubtedly exceeds GMP.

CONCLUSION

63 There are consent holders in the Upper Waitaki that hold resource consents that are subject to a comprehensive suite of water quality conditions, as well as conditions that limit the amount of N & P leached from their properties.

- 64 Submissions were received questioning the need for these consent holders to obtain a further consent, presumably to ensure that the land owners operate at a minimum of GMP.
- 65 The conditions already imposed on the consents require landowners to do just that, and in fact, go beyond what is expected under GMP. To impose more regulation, with no environmental benefit, is onerous and excessive.
- 66 Therefore, it is submitted that these consent holders should be able to carry on as permitted activity under PC5.
- 67 Additionally, pathways have been proposed that remedy discrepancies between limits imposed on these consents and those set in Tables 15B(b) and 15B(d) of PC5. This is to ensure that limits are fair and equitable for all farmers in the Upper Waitaki, and that consent holders who have gone through a long, expensive, but robust consenting process, are not penalised.



Keri Johnston

Date 22 July 2016

APPENDIX ONE – COPY OF AN UPPER WAITAKI CONSENT WITH WATER QUALITY CONDITIONS

1 Diversion and take of water

- 1 Water shall only be diverted, taken and stored from the Quailburn Stream, at or about map reference NZMS 260 H39:646-364 at a rate not exceeding 140 litres per second, with a volume not exceeding 12,096 cubic metres per day and 1,231,250 cubic metres per year between 1 July and the following 30 June.

- 2 Subject to Condition 3, whenever the combined flow in Quailburn Stream at Henburn Rd, NZMS 260 H39:6553-3542 and the abstracted flows relating to Government Race (CRC991473, CRC991474, CRC991475) and this permit, as estimated by the Canterbury Regional Council:
 - a. Are equal or greater than 410 litres per second, the maximum rate at which water is taken shall not exceed 140 litres per second;
 - b. Are less than 410 litres per second, and greater than 100 litres per second, a sharing regime shall apply that limits the combined rate of abstraction to ensure that the flow in the Quailburn at Henburn Road, is equal to or greater than 100 litres per second
 - c. Are equal to or less than 100 litres per second the taking of water in terms of this permit for irrigation purposes shall cease.

- 3 Where the Canterbury Regional Council, in consultation with a Water Users Committee representing, but not limited to, surface water and hydraulically connected groundwater users who are subject to the above minimum flow, has determined upon a water sharing regime that limits the total abstraction from the resource as referred to above, then the taking of water in accordance with that determination shall be deemed to be in compliance with Condition 2.

4 Use of water

- 4 Water shall only be used for the border dyke and spray irrigation of 190 hectares of crops and pasture for grazing sheep, beef cattle, or non-milking dairying cows per irrigation season within the area of land shown on attached Plan CRC132204, which forms part of this consent.

- 5 There shall be a minimum 5 metre setback, where there is no irrigation, from any permanently flowing waterways within the irrigation area marked on Plan CRC132204

including the Quailburn Stream, and a minimum setback from the Ahuriri River of 50 metres.

- 6 The consent holder shall take all practicable steps to:
 - a. Ensure that the volume of water used for irrigation does not exceed that required for the soil to reach field capacity; and
 - b. Avoid leakage from pipes and structures; and
 - c. Avoid the use of water onto non-productive land such as impermeable surfaces and river or stream riparian strips.
- 7 The consent holder shall ensure water races used to convey water diverted in terms of this permit are well maintained to minimise losses.
- 8 **Conversion**
- 8 The consent holder shall within a period of five years from the commencement date of this consent, convert to spray irrigation and advise the Canterbury Regional Council as to the staging of any conversion.
- 9 Any rights to continue border dyke and/or wild flood irrigation shall cease five years from the commencement date of this consent. The consent holder shall advise the RMA Compliance and Enforcement Manager at the Canterbury Regional Council of the completion of the conversion prior to the commencement and use of the new completed spray system.
- 10 **Water metering – Minimum flows**
- 10 The consent holder shall, prior to exercising this consent, install a water level measuring device in a stable reach of the Quailburn Stream at map reference NZMS 260 H39:6553-3542 that will enable the determination of the continuous rate of flow in the reach of the water body to within an accuracy of ten percent.
- 11 The water level measuring device shall be installed at a site that will retain a stable relationship between flow and water level. The measuring device shall be installed in accordance with the manufacturer's instructions.
- 12 The consent holder shall install a tamper-proof electronic recording device such as a data logger(s) that shall:
 - a. Time stamp a pulse from the water level recorder at least once every 15 minutes; and

- b. Be set to wrap the data from the measuring device such that the oldest data will be automatically overwritten by the newest data (i.e. cyclic recording); and shall either
- c. Store the entire season's data in each 12-month period from 1 July to 30 June in the following year, which the consent holder shall then download and store and provide to the Canterbury Regional Council in a format and standard specified in the Canterbury Regional Council's form for Water Metering Data Collection; and be readily accessible to be downloaded by the Canterbury Regional Council or by a person authorised by the Canterbury Regional Council: RMA Compliance and Enforcement Manager; or
- d. Shall be connected to a telemetry system that collects and stores all of the data continuously with an independent network provider who will make that data available in a commonly used format at all times to the Canterbury Regional Council and the consent holder.

13 The measuring and recording devices described in Conditions 10 and 12 shall be available for inspection at all times by the Canterbury Regional Council.

14 Data from the recording device described in Condition 12 and the corresponding relationship between the water level and flow, and any changes in that relationship shall be provided to the Canterbury Regional Council annually in the month of June, and shall be accessible and available for downloading at all times by the Canterbury Regional Council.

15 Water metering – Take of water

15 The consent holder shall, within six months of the commencement date of this consent at the point of take:

- a. Install a water meter(s) that has an international accreditation or an equivalent New Zealand calibration endorsement suitable for use with an electronic recording device, from which the rate and the volume of water taken can be determined to within an accuracy of plus or minus five percent at a location(s) that will ensure the total take of water from Quailburn Stream is measured; and
- b. Install a tamper-proof electronic recording device such as a data logger that shall record (or log) the flow totals every 15 minutes.

16 The water meter and recording device(s) specified in Condition 15 shall be set to wrap the data from the measuring device(s) such that the oldest data will be automatically overwritten by the newest data (i.e. cyclic recording); and shall either:

- a. Store the entire season's data in each 12-month period from 1 July to 30 June in the following year, which shall be downloaded and stored in a commonly used format and provided to the Canterbury Regional Council upon request in a form and to a standard specified in writing by the Canterbury Regional Council; or
 - b. Be connected to a telemetry system which collects and stores all of the data continuously with an independent network provider who will make that data available in a commonly used format at all times to the Canterbury Regional Council and the consent holder. No data in the recording device(s) shall be deliberately changed or deleted.
- 17 If the water meter specified in Condition 15(a) is not an electromagnetic or ultrasonic meter, the consent holder shall, prior to the first exercise of this consent install or make available an easily accessible straight pipe(s) at a location where the total water take is passing through, with no fittings or obstructions that may create turbulent flow conditions, of a length at least 15 times the diameter of the pipe, as part of the pump outlet plumbing or within the mainline distribution system, to allow the Canterbury Regional Council to conduct independent measurements.
- 18 The water meter and recording device(s) specified in Condition 15 shall:
- a. Be installed by a suitably qualified person in accordance with ISO 1100/1-1981 (or equivalent) and the manufacturer's instructions; and
 - b. Be maintained throughout the duration of the consent in accordance with the manufacturer's instructions; and
 - c. Be accessible to the Canterbury Regional Council at all times for inspection and/or data retrieval.
- 19 All practicable measures shall be taken to ensure that the water meter and recording device(s) specified in Condition 15 are at all times fully functional and have an accuracy standard of five percent.
- 20 Within one month of the installation of the measuring or recording device(s) specified in Condition 15 (or any subsequent replacement devices), the consent holder shall provide a certificate to the Canterbury Regional Council, attention: RMA Compliance and Enforcement Manager, signed by a suitably qualified person certifying, and demonstrating by means of a clear diagram, that:
- a. The measuring and recording device(s) is installed in accordance with the manufacturer's specifications; and
 - b. Data from the recording device(s) can be readily accessed and/or retrieved in accordance with Condition 16.

- 21 At five yearly intervals or at any time when requested by the Canterbury Regional Council, the consent holder shall provide a certificate to the Canterbury Regional Council, attention: RMA Compliance and Enforcement Manager, signed by a suitably qualified person certifying that:
- a. The water meter(s) is measuring the rate of water taken as specified in Conditions 15 to 19 inclusive; and
 - b. The tamper-proof electronic recording device is operating as specified in Conditions 15 to 19 inclusive.

22 Exclusion Device

- 22 The consent holder shall within a period of 5 years from the commencement date of this consent or on conversion to spray irrigation (whichever occurs earlier) ensure:
- a. A fish exclusion device is installed, operated and maintained on the intake to ensure that fish are prevented from passing into the intake.
 - b. The fish exclusion device is positioned to avoid the entrapment of fish at the point of abstraction, and to minimise the risk of fish being damaged by contact with the fish exclusion device.
 - c. The fish exclusion device is designed or supplied by a person with experience in freshwater ecology and fish exclusion techniques, who shall ensure that the performance criteria specified in conditions 22 (a) and 22(b) are achieved and that the device is designed in accordance with best practice, as outlined in the document Fish Screening: Good Practice Guidelines for Canterbury, NIWA CHC-2007-092.
 - d. Prior to the installation of the fish exclusion device, a report containing final design plans that demonstrate that the fish exclusion device will meet the performance criteria specified in conditions 22(a) and 22(b), and an operation and maintenance plan for the fish exclusion device, shall be provided to Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager.
 - e. Before the taking of any water in terms of this permit, a certificate shall be provided to Canterbury Regional Council, by a person with experience in freshwater ecology and fish exclusion techniques, to certify that the design plans and operation and maintenance plan for the fish exclusion device will meet performance criteria as outlined in this condition, and that the fish exclusion device has been installed in accordance with the details provided to Canterbury Regional Council in accordance with condition 22(d).

- f. The fish exclusion device shall be maintained in good working order. Records shall be kept of all inspections and maintenance, and those records shall be provided to Canterbury Regional Council upon request.

23 Nutrient Loading

23 For the purposes of interpretation of the conditions of this consent Quailburn Downs shall be defined as the areas in certificates of title and Pastoral Lease numbers OT6A/767-8, which total 2,194 hectares.

24 Nitrogen and phosphorus losses from farm activities to be undertaken in the forthcoming year are not to exceed those resulting from the farming activities described in the Overseer input file:

- a. The Overseer input file is defined as “TRIM no C06C/17884” attached to and forming part of this consent.
- b. ‘Forthcoming year’ means the period 1 July to 30 June.

25

- a.
 - i. Using the Overseer input file referred to in condition 24(a), a report shall be prepared not less than one month prior to the commencement of the irrigation season, calculating the losses of nitrogen and phosphorus under the latest version of the Overseer model and these losses shall be referred to as the Nutrient Discharge Allowance (“NDA”).
 - ii. Except that if a duplicate of this report under the same version of Overseer has been submitted previously in relation to this consent then no report is required under condition 25(a)(i).

- b. Where the NDA is to be reduced by the application of a River or Lake Water Quality condition, the reduced NDA shall apply.

Advisory note: The conditions of this consent do not specify the quantity (kg/annum) amount of nitrogen or phosphorus. Under version 6.0 of the Overseer model the NDA for the property was calculated to be 14,582 kg of nitrogen and 226 kg of phosphorus. Later versions of the Overseer model may produce a different value for the NDA.

- 26
- a. A second report shall be prepared not less than one month prior to the commencement of the irrigation season, demonstrating losses of nitrogen and phosphorus from farming activities to be undertaken in the forthcoming year do not exceed the NDA.
 - b. Losses of nitrogen and phosphorus shall be calculated using the latest version of the Overseer model.
 - c. After conversion to spray irrigation annual irrigation shall not commence until a certificate is produced by the person completing the modelling confirming that the modelling demonstrates calculated losses of nitrogen and phosphorus do not exceed the NDA.
- 27
- a. When undertaking modelling under conditions 25 and 26 the consent holder shall use either weather records collected on-farm or use constructed data from the nearest weather station; and
 - b. A copy of the reports and certificate prepared under conditions 25 and 26 shall be given to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager within one month of their completion.
- 28 The NDAs, incorporating any reductions required by receiving water quality nutrient trigger conditions, shall be complied with from the earlier of the first full year (1 July to 30 June) following completion of the irrigation conversion or five years from the commencement of consent.
- 29 Where Overseer, or Overseer modelling, is referred to for the purposes of calculating or determining compliance with the NDA limits associated with activities on the property, it shall be undertaken by an independent person with an Advanced Sustainable Nutrient Management Certificate issued by Massey University or an equivalent qualification
- 30 Subject to condition 31 the consent holder shall at all times comply with the Farm Environmental Management Plan (FEMP) for Quailburn Downs, in particular, the mitigation measures set out in section 5 of the FEMP as provided to the Canterbury Regional Council in November 2010 and dated August 2012 unless the FEMP has been superseded in which case the updated FEMP, subject to receipt of notice under condition 31 shall be complied with. A copy of the FEMP is attached to these conditions and marked FEMP CRC011987 and forms part of these conditions.
- 31 The consent holder shall implement, the FEMP for Quailburn Downs and the FEMP shall be updated as necessary to reflect any changes in the farming operation over time. A copy of any updated FEMP shall be provided to the Canterbury Regional Council; Attention: RMA Compliance and Enforcement Manager and shall include:
- a. Verification of compliance with NDAs (incorporating any reductions required by receiving water quality nutrient trigger conditions) by farm nutrient

modelling using the model Overseer (AgResearch model version number 6.0 or later).

- b. Implementation of Mandatory Good Agricultural Practices (“MGAPS”) and requirements to manage in accordance with the Quailburn Downs Overseer model inputs.
 - c. The Overseer parameter inputs report, which shall be supplied to the Canterbury Regional Council.
 - d. A property specific environmental risk assessment (including a description of the risks to water quality arising from the physical layout of the property and its operation which are not factored in as an Overseer parameter) prepared by a suitably qualified person which identifies any farm specific environmental risks along with measures to mitigate the farm specific environmental risks.
 - e. A requirement to review the risk assessment if there are any significant changes in land use practice.
- and

any updated FEMP shall not be implemented until written notice is received from the consent authority that the updated FEMP complies with sub-clauses (a) to (e) of this condition.

- 32 Detailed records shall be maintained of fertilizer application rates, types of crops (including winter feed/forage crops), cultivation methods, stock units by reference to type, breed and age, prediction of realistic crop yields that are used to determine crop requirements and all other inputs to the Overseer nutrient budgeting model.
- 33 A report on Overseer modelling shall be provided within one month of completion of the Overseer modelling by the person with the qualifications described in Condition 29 and no later than two months prior to the start of the next irrigation season to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager. The consent holder shall supply to the Canterbury Regional Council all model inputs relied upon for the annual Overseer® modelling.
- 34 Changes may be made to the Quailburn Downs Overseer model inputs, provided that written certification is provided that the change is modelled using Overseer, and that the result of that modelling demonstrates that the NDAs are not exceeded. A copy of that certification plus a copy of the resultant Overseer parameter report shall be provided to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, prior to the implementation of that change.

35 Subdivision

- 35 The NDAs shall be recalculated if there is a sale or transfer of any part, but not the whole, of the total farm area of 2194 hectares. The recalculated NDAs shall be undertaken to accurately redistribute the NDA between the resultant properties and shall replace the NDAs specified in Condition 25. The new NDAs may be recalculated on any proportion as long as the total of all the NDAs does not exceed the NDAs of the parent title as set out in Condition 23. The recalculation of the NDAs shall be undertaken and certified using Overseer, completed and provided to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager together with a copy of the full Parameter report, within one month of the sale or transfer.
- 36 **Fertiliser and soil management**
- 36 Fertiliser shall be managed and applied in accordance with 'The Code of Practice for Nutrient Management (With Emphasis on Fertiliser Use) 'Fertiliser Association, 2013, ISBN 978-0-473-28345-2' or any subsequent updates.
- 37 The consent holder shall keep a record of all fertiliser applications applied to the property, including fertiliser type, concentration, date and location of application, climatic conditions, mode of application and any report of the fertiliser contractor regarding the calibration of the spreader.
- 38 For land based spreading of fertiliser:
- a. If an independent fertiliser spreading contractor is used to spread the fertiliser on the property the consent holder shall keep a record of the contractor used, which can be supplied to the Canterbury Regional Council upon request; or
 - b. If the consent holder's own fertiliser spreaders are used, the consent holder shall test and calibrate the fertiliser spreaders at least annually, and every five years the fertiliser spreader will be certified by a suitably qualified person in accordance with 'The Code of Practice for Nutrient Management (With Emphasis on Fertiliser Use) Fertiliser Association, 2013, ISBN 978-0-473-28345-2' (or any subsequent updates) and the results of testing shall be provided to the Canterbury Regional Council upon request.
- 39 Nitrogen fertiliser shall not be applied to land between 31st May and 1st September.
- 40 All fertiliser brought onto the property which is not immediately applied to the land shall be stored in a covered area that incorporates all practicable measures to prevent the fertiliser entering waterways.
- 41 **Fertiliser and soil management**

- 41 Applications of nitrogen fertiliser shall not exceed 50 kg nitrogen / hectare per application.
- 42 If liquid fertilisers, excluding liquid effluent, are stored on-site for more than three working days, the consent holder shall ensure that the fertiliser is stored in a bunded tank, at least 110% of the volume of the tank to avoid any discharge to surface or groundwater and such that it is also protected from vehicle movements.
- 43 Fertiliser filling areas shall not occur within 50 metres from a water course, spring or bore.
- 44 For land based spreading, fertiliser should not be applied within 20 metres of a watercourse.
- 45 Where practicable, the consent holder shall:
- a. Use direct drilling as the principal method for establishing pastures; and
 - b. Sow and irrigate all cultivated areas within the irrigation area as soon as possible following ground disturbance.
- 46 Irrigation Infrastructure**
- 46 The consent holder shall ensure that all new irrigation infrastructure (not on the property at the time of commencement of this consent) is:
- a. Designed and certified in accordance with the 'Irrigation Code of Practice and Irrigation Design Standards, Irrigation NZ, March 2007' (code of practice) by a suitably qualified independent expert and installed in accordance with the certified design. Copies of certified design documents shall be provided to the Canterbury Regional Council upon request; and
 - b. Tested within 12 months of the first installation of the new irrigation infrastructure and afterwards every five years by a suitably qualified independent expert holding a National Certificate in Irrigation Evaluation Level 4.
- 47 Within two months of the testing referred to in Condition 46(b) the expert shall prepare a report outlining their findings and shall identify any changes needed to comply with the code of practice. Any such changes shall be implemented within five years from the date of the report. A copy of the report shall be provided to the Canterbury Regional Council Attention: RMA Compliance and Enforcement Manager, within three months of the report being completed.

48 If existing irrigation infrastructure is being used, the consent holder shall obtain an evaluation report prepared by a suitably qualified person, on the following terms:

- a. The evaluation shall determine the system's current performance in accordance with the Code of Practice for Irrigation Evaluation.
- b. This report shall be obtained within three months of the first exercise of the consent.
- c. Any recommendations identified in the report shall be implemented within five years from the date of receipt of the report.
- d. A copy of the report shall be forwarded to the Canterbury Regional Council within three months of the report being completed.

49 River water quality monitoring and response

49 The water quality of the Quailburn Stream shall be monitored within six months of the first exercise of consent as follows:

- a. The location for monitoring of Quailburn Stream shall be as follows unless minor changes are required to ensure that monitoring occurs upstream of all intakes and downstream of the irrigation area to appropriately monitor the localised river effects arising from the exercise of this consent:
 - i. Map reference: NZMS 260 H39: 646-364 immediately upstream of all irrigation takes on the Quailburn Stream.
 - ii. Map reference: the Quailburn Stream inflowing water upstream of the confluence with the Ahuriri River (downstream of the irrigation area)
- b. Water quality variables monitored shall include:
 - i. dissolved inorganic nitrogen (DIN);
 - ii. dissolved reactive phosphorus (DRP);
 - iii. dissolved oxygen;
 - iv. conductivity;
 - v. turbidity;
 - vi. periphyton biomass as chlorophyll a per square metre (chl a);
and
 - vii. E. Coli.
- c. This monitoring may be carried out on an individual basis, or may be prepared in collaboration with other consent holders, or on a collective basis by a suitable independent body appointed by all relevant consent holders in the sub catchment.
- d. Frequency of monitoring: Once per month from 01 December to 30 April each year, with a minimum of three weeks between sampling.
- e. Methods: The methods of sampling and analysis shall be those that are generally accepted by the scientific community as appropriate for monitoring river water quality and periphyton biomass. The methods of sampling shall be documented and made available to the Canterbury Regional Council on request.

- f. The water quality monitoring shall be undertaken by a suitably qualified and/or experienced person who demonstrates that they understand the appropriate methods to use for surface water quality sampling, including preservation of samples. That person shall certify in writing that each batch of samples has been sampled and preserved in accordance with generally accepted scientific methods. A copy of those certifications and the person's qualifications shall be provided to the Canterbury Regional Council on request.
 - g. The laboratory undertaking analyses shall be accredited for those analyses by International Accreditation New Zealand (IANZ) or an equivalent accreditation organisation that has Mutual Recognition Agreement with IANZ.
 - h. The results of all sampling shall be provided to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager by 30 May each year. This shall include copies of reports from the laboratory that undertook the analyses.
- 50 If the monitoring undertaken in accordance with Condition 49 shows that the average sample result for the downstream Quailburn Stream monitoring site specified in Condition 49 over the period December to April is greater than 0.10 mg/l of DIN; or 0.007 mg/l DRP; or 50 mg chl *a*/ m² (early warning trigger) but does not exceed 0.18 mg/l of DIN; or 0.007 mg/l DRP; or 90 mg chl *a*/ m² (environmental standard trigger), then the consent holder shall commission a report into the cause of the breach of the early warning trigger.
- 51 The reports referred to in Condition 50 and 55 shall:
- a. Be prepared by an expert review panel consisting of two qualified and experienced independent scientists. One of the scientists shall be nominated by the Canterbury Regional Council, and the other shall be appointed by the consent holder; and
 - b. Include the experts' conclusion on whether the exceedance(s) were as a result of natural influences, one off events, or in whole or part by nutrient loss associated with the irrigation authorised by this consent; and
 - c. Include an assessment as to whether the exceedance measured by the monitoring is likely to continue; and
 - d. Be completed by 30 July following the sampling; and
 - e. Be provided to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, by 30 August following the sampling.
- 52 If both the authors of the report prepared in accordance with Condition 51 conclude, after considering all the relevant available information (including on-site monitoring, sub-catchment monitoring, and catchment resource consent compliance and audit reports made available by the Canterbury Regional Council) that either:
- a. The cause of the breach of the early warning trigger was unlikely to have been caused in whole or in part by nutrient loss associated with the irrigation authorised by this consent; or

- b. That it is unlikely that there is a trend towards exceedance of the environmental standard trigger pertaining to the downstream Quailburn Stream monitoring site,

Then no further action needs to be undertaken by the consent holder.

53 If Condition 52 is not satisfied, then:

- a. The NDA, as specified in Condition 25, shall be reduced by 5% x Irrigation Proportion Factor (IPF) for the irrigation season subsequent to the monitoring period. The IPF shall be the proportion of the total authorised irrigation area developed for irrigation at the time of the exceedance under this resource consent divided by the total farm area (being 190 irrigated hectares on a total farm area of 2,194 hectares); and
- b. The consent holder shall prepare and implement a Remedial Action Plan in accordance with Condition 54.

54 In relation to the Remedial Action Plan referred to in Condition 53(b) and 57(b):

- a. It shall set out the methods and timeframes for altering and/or adapting farm land use practices to ensure that the exceedance in the early warning trigger pertaining to the Quailburn Stream monitoring site, is returned as soon as practicable to and maintained below the average sample results of 0.10 mg/l of DIN; or 0.007 mg/l of DRP; or 50 mg chl a/ m² (early warning trigger) for the Quailburn Stream monitoring site, over the period December to April.
- b. It shall be prepared by a suitably qualified and experienced person using Overseer or an equivalent method to demonstrate that the actions to be undertaken will achieve the necessary nutrient reductions as soon as practicable.
- c. If the Remedial Action Plan is prepared in collaboration with other consent holders who are required to prepare a Remedial Action Plan for this sub-catchment a common Remedial Action Plan shall be deemed to comply with this condition.
- d. Any actions required by the Remedial Action Plan shall be incorporated as soon as possible into the consent holder's FEMP which shall be submitted to the Canterbury Regional Council; Attention: RMA Compliance and Enforcement Manager along with the Remedial Action Plan within 5 working days of completion.
- e. The amended FEMP shall be implemented as soon as the consent authority has given written notice that it complies with the Remedial Action Plan and condition 31(a) to (e). The consent holder shall provide the Canterbury Regional Council with the Remedial Action Plan and an amended FEMP upon request.

55 If the monitoring undertaken in accordance with Condition 49 shows that the average sample result for the downstream Quailburn Stream monitoring site specified in Condition 49 over the period December to April is greater than 0.18 mg/l of DIN; or

0.007 mg/l DRP; or 90 mg chl *a*/ m² (environmental standard trigger), then the consent holder shall commission a report into the cause of the breach of the environmental standard trigger. This report shall satisfy the requirements specified in Condition 51.

56 If both the authors of the report prepared in accordance with Condition 51 conclude, after considering all the relevant available information, including on-site monitoring, sub-catchment monitoring, and catchment resource consent compliance and audit reports made available by the Canterbury Regional Council, that the cause of the breach of the environmental standard trigger was unlikely to have been caused in whole or in part by nutrient loss associated with the irrigation authorised by this consent, then no further action needs to be undertaken by the consent holder.

57 If the report prepared in accordance with Condition 51 concludes that the environmental standard trigger has been exceeded because of farm land use practices, then:

- a. The NDA, as specified in Condition 25, shall be reduced by 10% x Irrigation Proportion Factor (IPF) for the irrigation season subsequent to the monitoring period. The IPF shall be the proportion of the area under irrigation (at the time of the exceedance) under this resource consent divided by the total farm area (being 190 irrigated hectares on a total farm area of 2,194 hectares); and
- b. The consent holder shall prepare and implement a Remedial Action Plan in accordance with Condition 54.

58 If a required reduction in nutrient load is in effect under Condition 53(a) or 57(a) and monitoring for that period shows that the average sample results for the downstream Quailburn Stream monitoring site over the period December to April is:

- a. Greater than 0.18 mg/l of DIN; or 0.007 mg/l DRP; or 90 mg chl *a*/ m² (environmental standard trigger), then there shall be a further NDA reduction of 10% x IPF for the subsequent irrigation season.
- b. Less than or equal to 0.18 mg/l of DIN; or 0.007 mg/l DRP; or 90 mg chl *a*/ m² (environmental standard trigger), but greater than 0.10 mg/l of DIN; or 0.007 mg/l of DRP; or 50 mg chl *a*/ m² (early warning trigger), then there shall be a further NDA reduction of 5% x IPF for the subsequent irrigation season.
- c. Less than or equal to 0.10 mg/l of DIN; or 0.007 mg/l of DRP; or 50 mg chl *a*/ m² (early warning trigger), then for the subsequent season no NDA reduction shall be required under this condition, and the full NDA for the property, as specified in Condition 25 shall be restored.

59 Lake water quality monitoring and response

59 The water quality of the Ahuriri Arm of Lake Benmore and Lower Lake Benmore shall be monitored in accordance with this condition from the date water is taken under this consent as follows

- a. Locations:

- i. Ahuriri Arm, Map reference: NZMS 260 H39:8027-2667
 - ii. Lower Lake Benmore, Map reference: NZMS 260 H39:8802-2371
 - b. Depths: depth integrated 0-10m
 - c. Water quality variables:
 - i. Total nitrogen;
 - ii. Total phosphorus;
 - iii. Chlorophyll a.
 - d. Calculated key water quality variable: Trophic Lake Index (TLI), using the following equations:
 - i. $TLc = 2.22 + 2.54 \log(\text{chlorophyll } a)$;
 - ii. $TLp = 0.218 + 2.92 \log(\text{total phosphorus})$;
 - iii. $TLn = -3.61 + 3.01 \log(\text{total nitrogen})$;
 - iv. $TLI = S(TLc + TLp + TLn)/3$.
 - e. Frequency of monitoring: Once per month from 01 December to 30 April each year, with a minimum of three weeks between sampling.
 - f. Methods: The methods of sampling and analysis shall be those that are generally accepted by the scientific community as appropriate for monitoring lake water quality. The methods of sampling shall be documented and made available to the Canterbury Regional Council on request.
 - g. The water quality monitoring shall be undertaken by a suitably qualified and/or experienced person who demonstrates that they understand the appropriate methods to use for lake water quality sampling, including depth integrated sampling, and preservation of samples. That person shall certify in writing that each batch of samples has been sampled and preserved in accordance with generally accepted scientific methods. A copy of those certifications and the person's qualifications shall be provided to the Canterbury Regional Council on request.
 - h. The laboratory undertaking analyses shall be accredited for those analyses by International Accreditation New Zealand (IANZ) or an equivalent accreditation organisation that has Mutual Recognition Agreement with IANZ and shall be capable of analysing the variables listed in subparagraph c above with detection limits generally recognised by the scientific community as appropriate for oligotrophic lakes.
 - i. The results of all sampling including the calculated average summer TLI, shall be provided to the Canterbury Regional Council Attention: RMA Compliance and Enforcement Manager by 30 May each year. This shall include copies of reports from the laboratory that undertook the analyses.
- 60 If the monitoring undertaken in accordance with Condition 59 shows that the average TLI for the 1 - 10 m depth integrated samples for either the Ahuriri Arm monitoring site or the Lower Benmore monitoring site over the period December to April is greater than 2.75 (early warning trigger) but does not exceed 3.0 (environmental standard trigger), then:
- a. The NDA, as specified in Condition 25, shall be reduced by 5% x the Irrigation Proportion Factor (IPF) for the irrigation season subsequent to the

monitoring period. The IPF shall be the proportion of the area developed for irrigation under this resource consent i.e. 190 hectares divided by the total farm area of 2,194 hectares; and

- b. A report into the cause of the breach of the early warning trigger shall be prepared by a person with an appropriate post-graduate science qualification, by 30 July following the sampling. A copy of this report shall be provided to the Canterbury Regional Council Attention: RMA Compliance and Enforcement Manager, by 30 August following the sampling.
- 61 If a reduction in nutrient loading is required under Condition 60(a) and monitoring in the period that that reduction applies shows that the average TLI for the 1 – 10 m depth integrated samples for the monitoring site over the period December to April:
- a. Continues to be greater than 2.75 but does not exceed 3.0 then there shall be a further NDA reduction of 5% x IPF for the subsequent irrigation season.
 - b. Is less than or equal to 2.75, then for the subsequent season the full NDA for the property, as specified in Condition 25 shall be restored.
- 62 If the monitoring undertaken in accordance with Condition 59 shows that the average TLI for the 1 - 10 m depth integrated samples for either the Ahuriri Arm monitoring site or the Lower Benmore monitoring site monitoring site over the period December to April is greater than 3.0 (environmental standard trigger), then:
- a. The NDA, as specified in Condition 25, shall be reduced by 10% x Irrigation Proportion Factor (IPF) for the irrigation season subsequent to the monitoring period. The IPF shall be the proportion of the area authorised for irrigation under this resource consent (190 ha) divided by the total farm area (2,194 ha); and
 - b. A report into the cause of the breach of the environmental standard trigger shall be prepared by a person with an appropriate post-graduate science qualification, by 30 July following the sampling. A copy of this report shall be provided to the Canterbury Regional Council Attention: RMA Compliance and Enforcement Manager, by 30 August following the sampling.
- 63 If a reduction in nutrient loading is required under Condition 62(a) and monitoring in the period that that reduction applies shows that the average TLI for the 1 – 10 m depth integrated samples for either the Ahuriri Arm monitoring site or the Lower Benmore monitoring site over the period December to April:
- a. Continues to be greater than 3.0 then there shall be a further NDA reduction of 15% x IPF for the subsequent irrigation season and rising to 20% compounding reductions for any further irrigation season.
 - b. Continues to be greater than 2.75 but does not exceed 3.0 then there shall be a further NDA reduction of 5% x IPF for the subsequent irrigation season.
 - c. Is less than or equal to 2.75, then for the subsequent season the full NDA for the property, as specified in Condition 25 shall be restored.
- 64 The nutrient load reductions and investigation referred to in Conditions 60 to 63 inclusive shall not be required if a two person expert scientist panel (with one expert nominated by the Canterbury Regional Council) both conclude after considering all the relevant

available information (including catchment resource consent compliance, FEMP compliance monitoring pertaining to this consent and audit reports made available by the Canterbury Regional Council) that the cause of the breach of the early warning trigger or environmental standard (as applicable) was unlikely to have been caused in whole or in part by nutrient loss associated with the irrigation authorised by this consent.

65 Review of Conditions

65 The Canterbury Regional Council may, once per year, on any of the last five working days of March or July serve notice of its intention to review the conditions of this resource consent for the purposes of dealing with any adverse effect on the environment which may arise from the exercise of the resource consent and which it is appropriate to deal with at a later stage, including (but not limited to) amending the flow in the Quailburn Stream at which abstraction is required to be reduced or discontinued as set out in Condition 2; or to enable the use of a model or method as an alternative to Overseer.

66 Lapse

66 The lapsing date for the purposes of section 125 of the Resource Management Act shall be five years from the commencement of this consent.

Advice notes:

- *In relation to the lake monitoring required under Condition 59, it is anticipated that all consent holders subject to this condition would coordinate and cooperate together to ensure that the lake water quality monitoring is undertaken and the costs of that monitoring is shared between those consent holders. The Canterbury Regional Council may provide resources to facilitate that coordination and recover the costs of that facilitation from the relevant resource consent holders as a cost of supervising and administering the resource consents. Any non-compliance with water quality monitoring requirements would be a matter for all relevant consent holders and may be the subject of enforcement proceedings.*
- *If any additional land use consents are required to carry out the proposed activity, those consents must be obtained before giving effect to this consent.*
- *Condition 1 refers to storage of water and unless the activities of the damming of water and any associated earthworks are permitted activities, resource consents for either or both of those activities will be required before the storage of water is commenced.*