

BEFORE THE CANTERBURY REGIONAL COUNCIL

IN THE MATTER OF

The Resource Management Act 1991

AND

IN THE MATTER OF

an application by **Haldon Station Limited** filed under **CRC042561** for a water permit to take and use groundwater from bore I39/0004 and bore I39/0005 for the spray irrigation of 190 hectares of pasture at Haldon Arm Road, Benmore.

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

PART B - SITE SPECIFIC DECISION

1 INTRODUCTION

- 1.1 This is the final decision on application CRC042561 by **Haldon Station Limited** (the applicant). This decision follows and should be read in combination with our Interim Decision on these applications dated 29 March 2012.

2 INTERIM DECISION

- 2.1 In our Interim Decision, we concluded that the introduction of a pivot in close proximity to Haldon Arm Road will give rise to significant issues in terms of effects on landscape and amenity. We considered that the only way in which the development could be seen to be appropriate was by including a buffer of 250 metres from Haldon Arm Road in which no irrigation should occur. In addition, we concluded that all practical steps should be taken to ensure that the existing vegetation remains as it is now within that buffer area.
- 2.2 On this basis, we directed that the applicant provide the following information:
- (a) An amended pivot plan for the pivot irrigation area identifying and providing for a 250 metre buffer setback from Haldon Arm Road;
 - (b) Consequent revisions of annual volumes; and
 - (c) A plan providing for the retention of existing vegetation within the 250 metre buffer as identified above.

3 APPLICANT'S RESPONSE

- 3.1 In response to our Interim Decision, we received correspondence dated 24 April 2012 from Mr Richard de Joux on behalf of the applicant. This included a revised pivot plan, which provided a setback of 250 m from which there was no irrigation.
- 3.2 This setback was achieved by revising the size and location of the command area in which irrigation would occur. The original proposal was for a centre pivot irrigating 150 ha, with 40 ha irrigated via k-line irrigation systems or a travelling gun. The revised proposal retains the same total irrigation area of 190 ha, but provides a larger command area of approximately 290 ha within which this irrigation may occur. Three centre pivots are shown on the plans provided.
- 3.3 Mr de Joux emphasised that the pivot layout was only a potential option and that the final configuration may change following the completion of commissioning and pump testing of bore I39/0044. However, the command area and the total area of land irrigated would not change. As the total amount of land being irrigated had not changed from the original proposal, Mr de Joux said that no reduced in annual volume or property thresholds is required.
- 3.4 In relation to retention of vegetation with the setback, Mr de Joux noted that the existing vegetation reflects decades of dryland farms and consists of modified pastures with both native and introduced species. The applicant accepted that this environment is to be retained and proposed the following measures to achieve this objective:
- (a) Fencing the developed area off from the neighbouring buffer strip;
 - (b) The area will not be used as stock run-off;
 - (c) The area will not be cultivated or direct drilled into improved plant species;
 - (d) The proposed pivot and associated buffer will be supplied as a marked-up aerial photo in the FEMP and updated periodically in the future.
- 3.5 In addition to the above, the applicant provided some further information on the relevant groundwater bores. Bore I39/0005 had been drilled and tested, indicating that a long term pump rate of 60 L/s could be achieved. However, bore I39/0004 had been drilled but not tested. If bore I39/0004 cannot sustain 50 L/s, it will be necessary to pump bore I39/0005 at a rate of 60 L/s to meet the requested volumes. It was therefore requested that a condition is included to the effect that a maximum rate of take from either bore is 60 L/s, with a combined rate not exceeding 100 L/s and a volume not exceeding 8,640 m³/day.

4 OUR CONSIDERATION

- 4.1 The proposal as now advanced is different to that which was originally notified. This raises an important issue for us to consider, being whether the changes since notification are in scope and whether we have the jurisdiction to consider them.
- 4.2 In order to determine the issue, we have carried out a broad comparison between the notified proposal and the current proposal. We have taken a wider view of the proposal and sought to identify the key aspects of the activities that may translate into effects on the environment.
- 4.3 Previously, there were two separate command areas for irrigation. There was the original large single centre pivot irrigation command area. The circumference of the command area extended to Haldon Arm Road and the foot of Mount Maggie. As will be obvious, the proximity to Haldon Arm Road caused us concern from a landscape and amenity effects perspective. The second original command area was a separate area located to the west of Mount Maggie. What is now proposed is a single command area that combines the original two separate commands. In our view, the main point of difference is that the irrigation command area now extends right around the toe of Mount Maggie when Mount Maggie is viewed from Haldon Arm Road.
- 4.4 Returning to the issue of scope, the general principle for modifications after notification is that the 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 Court in *Coull v Christchurch City Council*¹ adopted the following 3-part test to determine whether amendments are within scope:
- (a) Do the amendments increase the scale of intensity of the activity?
 - (b) Do the amendments exacerbate or mitigate the impacts of the activity, both in terms of adverse effects and in terms of the plan and other superior documents?
 - (c) Would parties who have not made submissions have done so if they were aware of the change?
- 4.5 Applying this 3-part test to what is here proposed we note the revised proposal retains the same total irrigation area of 190 ha but provides a larger command area of approximately 290 ha within which this irrigation may occur. Three centre pivots are shown on the plans provided; previously there was one large centre pivot and irrigation was also to occur via k-line irrigation systems or a travelling gun.
- 4.6 Mr de Joux confirmed that the total amount of land to be irrigated had not changed from the original proposal and there was no change in annual volume of water to be taken.
- 4.7 We conclude from the above that the amendments do not increase the scale or intensity of the activity. However, we note the command area over which the activity can occur has increased.
- 4.8 The amendments, in our view, will not exacerbate the impacts of the activity primarily because the same amount of water is to be utilised. Also, we note that in terms of the Waitaki District Plan and, for that matter, other superior documents there is no specific reference in landscape and/or amenity terms to the Mount Maggie area, which suggests or let alone require landscape and/or amenity protection. However, we note that it is our assessment of effects on these issues that has resulted in the 250 m setback from Haldon Arm Road being required.
- 4.9 In terms of the last test, we observe that the original application did not attract the attention of submitters in respect of landscape and amenity issues as experienced from Haldon Arm Road. This issue arose as a result of our consideration of those effects. Therefore we can conclude that the now proposed changes are most unlikely to attract the interest of submitters.
- 4.10 Accordingly, for the reasons stated above we are comfortable that what is now proposed is within scope.
- 4.11 On this basis, the reasons set out in our Interim Decision, and the applicants acceptance of retaining the 250 m setback from Haldon Arm Road, we conclude that the outcome which best achieves the purpose of the Act is to grant consent to the applications, subject to conditions.

¹ ENVC 077/06, paragraph 11.

5 DECISION

5.1 Pursuant to the powers delegated to us by the Canterbury Regional Council and pursuant to sections 104 and 104B of the Resource Management Act 1991, we **GRANT** application CRC042561 by Haldon Station Limited for the following activity:

to take and use groundwater from bore I39/0004 and bore I39/0005 for the spray irrigation of 190 hectares of pasture at Haldon Arm Road, Benmore.

5.2 Pursuant to section 108 RMA, the grant of consent is subject to the conditions specified at **Appendix A**, which conditions form part of this decision and consent

5.3 The duration of this consent shall be until the 30th April 2025.

DECISION DATED AT CHRISTCHURCH THIS 18TH DAY OF MAY 2012

Signed by²:

Paul Rogers



Dr James Cooke



Edward Ellison



² This decision has been signed as a majority decision of the three named Commissioners due to the death of Commissioner Mike Bowden.

APPENDIX A

Conditions of Consent (CRC042561)

Take of water

1. Water shall only be taken from:
 - (a) Bore 139/0004 300 mm diameter and 70.3 metres deep at or about map reference NZMS 260:H39:9166-4765; and
 - (b) Bore 139/0005 300 mm diameter and 80.0 metres deep at or about map reference NZMS 260:H39:9062-4728.
2. Water for irrigation shall only be taken between 1 September and the following 30 April at a maximum rate of 60 L/s from each bore and a maximum combined rate of 100 L/s.
3. The maximum volume of water taken shall not exceed 8640 cubic metres per day (being from 12am to 12am the following day) and 1,140 cubic metres per year (measured between 1 July and the following 30 June).

Use of water

4. Water shall be used only for the spray irrigation of crops and pasture for grazing stock excluding milking dairy cows to irrigate 190 hectares per irrigation season within the area of land shown on attached **Plan CRC042561**.
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 CRC0425461**.
6. Water for irrigation shall only be used on or applied to land that is subject to a memorandum of encumbrance that complies with the requirements of the agreement entitled "Agreement in Relation to the Allocation of Water for Irrigation" between Meridian Energy Limited and the Mackenzie Irrigation Company Limited dated the 31st of October 2006.
7. The consent holder shall, six months prior to this consent being exercised, provide to the Canterbury Regional Council a certificate from the consent holder's solicitor certifying that the memorandum of encumbrance is registered on the computer registers for the land shown on **Plan CRC042561** and any other evidence of registration as the Canterbury Regional Council may require (if any).
8. 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.

Mitigation

9. The depth at which water is drawn into the bores shall not be less than 60 metres below ground level.
10. The standing water level, relative to ground level in bore 139/0004 shall be measured as follows:
 - (a) Once at the start of the irrigation season before pumping is commenced;
 - (b) Once 2 days after the cessation of pumping at the end of the irrigation season; and
 - (c) Once within the first 7 days of each calendar month outside of the irrigation season.

11. All measurements of the standing water level and date of measurement shall be recorded in a log book kept for that purpose, and supplied to the Canterbury Regional Council, attention RMA Compliance and Enforcement Manager, each year during the month of June, or when requested in writing.
12. The following measures shall be implemented in relation to the area of land extending 250m onto the applicant's property from the boundary of Haldon Arm Road ("the setback area"):
 - (a) The irrigation area illustrated on Plan CRC042561 shall be fenced off from the setback area; Fencing the developed area off from the neighbouring buffer strip;
 - (b) The setback area shall not be used as stock run-off; and
 - (c) The setback area shall not be cultivated or direct drilled into improved plant species;

Water metering

13. The consent holder shall, prior to exercising this consent, install:
 - (a) 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 bore 139/0004 and i39/0005 is measured; and
 - (b) a tamper-proof electronic recording device such as a data logger that shall record (or log) the flow totals every 15 minutes.
14. If the water meter specified in Condition 13(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.
15. The measuring and recording device(s) specified in Condition 13 shall:
 - (a) 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);
 - (b) 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;
 - (c) be installed by a suitably qualified person in accordance with ISO 1100/1-1981 (or equivalent) and the manufacturer's instructions;
 - (a) be maintained throughout the duration of the consent in accordance with the manufacturer's instructions; and
 - (b) be accessible to the Canterbury Regional Council at all times for inspection and/or data retrieval.
16. No data in the recording device(s) shall be deliberately changed or deleted.
17. All practicable measures shall be taken to ensure that the water meter and recording device(s) specified in Condition 13 are at all times fully functional and meet the accuracy standard stated in that condition.
18. Within one month of the installation of the measuring or recording device(s) specified in Condition 13 (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 these conditions.
19. 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 these conditions; and
 - (a) the tamper-proof electronic recording device is operating as specified in these conditions.

Nutrient Loading

20. For the purposes of interpretation of the conditions of this consent Haldon Station shall be defined as the areas in Pastoral Lease numbers 262002, Certificate of Title references CB19F/807; CB437/82, CB6B/313, CB6B/334, which total approximately 22,000 hectares.
21. The consent holder shall prepare once per year:
- (a) an Overseer[®] nutrient budgeting model report not less than one month prior to the commencement of the irrigation season; and
 - (b) a report of the annual farm nutrient loading for Haldon Station using the model Overseer[®] (AgResearch model version number 5.4.3 or later).
22. When undertaking the modelling outlined in Condition 21, the consent holder shall use either weather records collected on-farm or from constructed data from the nearest weather station.
23. A copy of the reports prepared in accordance with Condition 21 shall be given to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager within one month of their completion.
24. The consent holder shall not commence annually irrigation under this consent unless the annual (1 July to 30 June) nutrient loading (the nutrient discharge allowances (NDAs)) as estimated in accordance with Condition 21 from Haldon Station does not exceed 54971 kg of Nitrogen and 3715 kg of Phosphorus. Where the NDAs have been reduced by the application of a receiving water quality nutrient trigger condition, the reduced NDA shall apply.
25. The NDAs, incorporating any reductions required by receiving water quality nutrient trigger conditions, shall be complied with from the commencement of consent.
26. Where Overseer, or Overseer modelling, is referred for the purposes of calculating or determining compliance with the NDA limits associated with activities on the property, it shall be undertaken by an independent person with an Advanced Sustainable Nutrient Management Certificate issued by Massey University or an equivalent qualification
27. The consent holder shall at all times comply with the Farm Environmental Management Plan (FEMP) for Haldon Station in particular, the mitigation measures and monitoring set out in sections 12 and 13 of the FEMP, a copy of which is attached to these conditions and marked **CRC042561-A** and forms part of these conditions.
28. Subject to Condition 27, the consent holder shall implement, and update annually the FEMP for Haldon Station. The FEMP 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 5.4.3 or later).
 - (b) Implementation of Mandatory Good Agricultural Practices ("MGAPS") and requirements to manage in accordance with the Haldon Station 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.
 - (f) An aerial photo illustrating the irrigation area, the location of the pivots and the setback area as referred to in Condition 12. This photo shall be updated on an annual basis.
29. 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.
30. 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 26 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.
31. Changes may be made to the Haldon Station Overseer model inputs, provided that written certification is provided that the change is modelled using Overseer, and that the result of that modelling demonstrates that the NDAs are not exceeded. 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.

Subdivision

32. 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 22,000 hectares. The recalculated NDAs shall be undertaken to accurately redistribute the NDA between the resultant properties and shall replace the NDAs specified in Condition 24. 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 24. 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.

Fertiliser and soil management

33. Fertiliser shall be managed and applied in accordance with 'The Code of Practice for Nutrient Management (With Emphasis on Fertiliser Use) NZFMRA 07' or any subsequent updates.
34. 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.
35. For land based spreading of fertiliser:
- (a) where an independent fertiliser spreading contractor is used the consent holder shall keep a record of the contractor used, which can be supplied to the Canterbury Regional Council upon request; or
 - (b) where the applicant'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) NZFMRA 07' or any

subsequent updates and the results of testing shall be provided to the Canterbury Regional Council upon request.

36. Nitrogen fertiliser shall not be applied to land between 31st May and 1st September.
37. 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.
38. Applications of nitrogen fertiliser shall not exceed 50 kg nitrogen / hectare per application.
39. 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.
40. Fertiliser filling areas shall not occur within 50 metres from a water course, spring or bore.
41. For land based spreading, fertiliser should not be applied within 20 metres of a watercourse.
42. 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.

Irrigation Infrastructure

43. 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 by a suitably qualified independent expert holding a National Certificate in Irrigation Evaluation Level 4, 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 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.
44. Within two months of the testing referred to in Condition 43(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.
45. 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.

Fertigation

46. If the irrigation system used in association with taking water in terms of this permit is to be used to distribute effluent, fertiliser or any other added contaminant, then one of the following shall be installed upstream of the point of addition of the effluent, fertiliser or other added contaminant:
 - (a) a reduced pressure zone device (RPZD), or
 - (b) a pressure vacuum breaker (PVB), or
 - (c) an air gap backflow prevention system.
47. Installation of a RPZD or a PVB shall be in accordance with section 9 (PVB) or section 12 (RPZD) of Australian/New Zealand Standard AS/NZS 2845.1 Water supply - Backflow prevention devices, Part 1: Materials, design and performance requirements, or an equivalent standard.
48. An air gap backflow prevention system shall have an unobstructed vertical air gap separation of at least twice the diameter of the inlet pipe, from the lowest point of the inlet pipe to the flood level rim of the receptacle into which it discharges.
49. Field testing and maintenance shall be carried out of an RPZD or a PVB at commissioning of the use of the system for application of effluent or fertiliser and annually afterwards, in accordance with AS 2845.3 Water supply—Backflow prevention devices, Part 3: Field testing and maintenance, or an equivalent standard.
50. An air gap backflow prevention system shall be tested at commissioning and annually afterwards. Maintenance shall be undertaken as necessary to ensure that backflow prevention is effective.
51. Installation, testing and maintenance shall be undertaken by a certified irrigation evaluator. A report on the annual testing shall be provided to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, within two weeks of initial commissioning and within two weeks of each annual testing. Each report shall be accompanied with the name, qualifications and experience of the person who undertook the installation, testing or maintenance

Groundwater quality monitoring and response

52. The water quality of ground water at Haldon Station shall be monitored within six months of the first exercise of consent as follows:
 - (a) The location for monitoring shall be bore 139-0007, Map reference 1399:156-4682, down gradient of the proposed irrigation areas.
 - (b) Water quality variables monitored shall include:
 - i. Nitrate Nitrogen;
 - ii. dissolved reactive phosphorus (DRP);
 - iii. conductivity;
 - iv. temperature; and
 - v. *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 groundwater quality. 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 groundwater 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.
53. If the monitoring undertaken in accordance with Condition 52 shows that the average sample result for groundwater located at I39: 9516-4682 over the period December to April is greater than its 4.0 mg/L of Nitrate Nitrogen; or 0.020 mg/L DRP (early warning trigger) but does not exceed 5.0 mg/L of Nitrate Nitrogen; or 0.025 mg/L DRP (estimated pre-irrigation limit), then the consent holder shall commission a report into the cause of the breach of the early warning trigger.
54. The reports referred to in Condition 53 and 58 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.
55. If both the authors of the report prepared in accordance with Condition 54 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 estimated pre-irrigation limit pertaining to the down gradient monitoring site,
- then no further action needs to be undertaken by the consent holder.
56. If Condition 55 is not satisfied, then:
- (a) the NDA, as specified in Condition 24, 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 (i.e. 190 irrigated hectares divided by the total farm area of 22,000 hectares); and

- (b) the consent holder shall prepare and implement a Remedial Action Plan in accordance with Condition 57.
57. In relation to the Remedial Action Plan referred to in Condition 56(b) and 60(b)(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 down gradient monitoring site, is returned as soon as practicable to and maintained below the average sample results of 4.0 mg/L of Nitrate Nitrogen and 0.020 mg/L of DRP (early warning trigger), 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 into the consent holder's FEMP. The amended FEMP shall be implemented as soon as physically possible.
 - (e) The consent holder shall provide the Canterbury Regional Council with the Remedial Action Plan and an amended FEMP upon request.
58. If the monitoring undertaken in accordance with Condition 52 shows that the average sample result for the down-gradient monitoring site specified in Condition 52 over the period December to April is greater than 5.0 mg/L of Nitrate Nitrogen or 0.025 mg/L DRP (estimated pre-irrigation limit), then the consent holder shall commission a report into the cause of the breach of the estimated pre-irrigation limit. This report shall satisfy the requirements specified in Condition 54.
59. If both the authors of the report prepared in accordance with Condition 58 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 estimated pre-irrigation limit 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.
60. If the report prepared in accordance with Condition 58 concludes that the estimated pre-irrigation limit has been exceeded because of farm land use practices, then:
- (a) the NDA, as specified in Condition 24, 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 (i.e. 190 irrigated hectares divided by the total farm area of 22,000 hectares); and
 - (b) the consent holder shall prepare and implement a Remedial Action Plan in accordance with Condition 57.
61. If a required reduction in nutrient load is in effect under Condition 56(a) or 60(a) and monitoring for that period shows that the average sample results for the down gradient monitoring site over the period December to April is:
- (a) greater than 5.0 mg/L of Nitrate Nitrogen or 0.025 mg/L DRP (estimated pre-irrigation limit), then there shall be a further NDA reduction of 10% x IPF for the subsequent irrigation season.
 - (b) less than 5.0 mg/L of Nitrate Nitrogen or 0.025 mg/L DRP (estimated pre-irrigation limit), but greater than 4.0 mg/L of Nitrate Nitrogen; or 0.020 mg/L of DRP (early warning

trigger), then there shall be a further NDA reduction of 5% x IPF for the subsequent irrigation season.

- (c) less than 4.0 mg/L of Nitrate Nitrogen or 0.020 mg/L of DRP (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 24 shall be restored.

Lake water quality monitoring and response

62. The water quality of the Haldon (Northern) Arm of Lake Benmore and Lower Lake Benmore shall be monitored in accordance with this condition from the commencement of consent as follows:

- (a) Locations:
 - i. Haldon Arm, Map reference: NZMS 260 H39:8823-3531
 - ii. Lower Lake Benmore, Map reference: NZMS 260 H39:8802-2371
- (b) Depths: depth integrated 0-10m, 25m, 50m
- (c) Water quality variables:
 - i. total nitrogen;
 - ii. ammonia;
 - iii. nitrate;
 - iv. nitrite;
 - v. total Kjeldahl nitrogen;
 - vi. total phosphorus;
 - vii. dissolved reactive phosphorus;
 - viii. Secchi disc depth; and
 - ix. chlorophyll *a*.
- (d) Calculated key water quality variable: Trophic Lake Index (TLI), using the following equations:
 - i. $TLc = 2.22 + 2.54 \log (\text{chlorophyll } a)$
 - ii. $TLp = 0.218 + 2.92 \log (\text{total phosphorus})$
 - iii. $TLn = -3.61 + 3.01 \log (\text{total nitrogen})$
 - iv. $TLI = \Sigma (TLc + TLp + TLn)/3$
- (e) Frequency of monitoring: Once per month from 01 December to 30 April each year, with a minimum of three weeks between sampling.
- (f) Methods: The methods of sampling and analysis shall be those that are generally accepted by the scientific community as appropriate for monitoring lake water quality. The methods of sampling shall be documented and made available to the Canterbury Regional Council on request.
- (g) The water quality monitoring shall be undertaken by a suitably qualified and/or experienced person that demonstrates that they understand the appropriate methods to use for lake water quality sampling, including depth integrated sampling, and preservation of samples. That person shall certify in writing that each batch of samples has been sampled and preserved in accordance with generally accepted scientific

methods. A copy of those certifications and the person's qualifications shall be provided to the Canterbury Regional Council on request.

- (h) The laboratory undertaking analyses shall be accredited for those analyses by International Accreditation New Zealand (IANZ) or an equivalent accreditation organisation that has Mutual Recognition Agreement with IANZ and shall be capable of analysing the variables listed in subparagraph c above with detection limits generally recognised by the scientific community as appropriate for oligotrophic lakes.
 - (i) The results of all sampling including the calculated average summer TLI, shall be provided to the Canterbury Regional Council Attention: RMA Compliance and Enforcement Manager by 30 May each year. This shall include copies of reports from the laboratory that undertook the analyses.
63. If the monitoring undertaken in accordance with Condition 62 shows that the average TLI for the 1 - 10 m depth integrated samples for either the Haldon 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 24, 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 under irrigation (i.e. 190 irrigated hectares divided by the total farm area of 22,000 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.
64. If a reduction in nutrient loading is required under Condition 63(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) continue 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) are less than 2.75, then for the subsequent season the full NDA for the property as specified in Condition 24 shall be restored.
65. If the monitoring undertaken in accordance with Condition 62 shows that the average TLI for the 1 - 10 m depth integrated samples for either the Haldon Arm monitoring site or the Lower Benmore monitoring site over the period December to April is greater than 3.0 (environmental standard trigger), then
- (a) the NDA as specified in Condition 24 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 (i.e. 190 irrigated hectares divided by the total farm area of 22,000 hectares); 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.
66. If a reduction in nutrient loading is required under Condition 65(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 Haldon Arm monitoring site or the Lower Benmore monitoring site over the period December to April:
- (a) continue 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) continue 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) are less than 2.75, then for the subsequent season the full NDA for the property as specified in Condition 24 shall be restored.

67. The nutrient load reductions and investigation referred to in Conditions 63 to 66 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.

Review of conditions

68. 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.

Lapse

69. 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 62, 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.*
- *The discharge of effluent, fertiliser or any contaminant would require authorisation as a permitted activity or via a discharge permit. Contact the Canterbury Regional Council for advice on the relevant regional rules.*
- *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.*

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