

UNDER

The Resource Management Act 1991

AND

IN THE MATTER OF

Resource consent application CRC102937 by TW & BM Lovett to take and use groundwater from the Ashburton-Lyndhurst groundwater zone for irrigation purposes.

DECISION OF INDEPENDENT COMMISSIONER EMMA CHRISTMAS
22 February 2011

Heard on 24 January 2011 at Environment Canterbury, Christchurch.

Appearances:

Applicant:

Mr Tim Lovett
Mrs Beth Lovett

Applicant representatives:

Mr John Talbot, Talbot Sustainability Ltd

Reporting Officer:

Ms Claire Penman
Mr Mike Thorley

DECISION

- 1 Mr and Mrs TW and BM Lovett have applied to take and use groundwater from bores L37/1144, L37/0255 and L37/0198 at Fairfield Road Newlands, for irrigation purposes (application CRC102937).
- 2 Under delegated authority from Canterbury Regional Council, I grant the above application subject to conditions, for the reasons discussed below.

BACKGROUND

- 3 Mr and Mrs Lovett hold resource consent CRC030700.1, to take and use groundwater to irrigate their property at Fairfield Road, Newlands. The consent is limited to an annual volume of 1,274,050 cubic metres per year. Metering of the take has been undertaken since 2008 and this has revealed that the annual volume is insufficient to fully irrigate the property for the entire season. The annual volume required has been assessed by the applicant as 1,434,050 cubic metres per year, and hence an application for the difference, 160,000 cubic metres per year, has been made. The consent is also limited by the rate of take from each of the three wells and by the maximum volume that can be taken from each well every ten days. No changes to these limits are proposed.
- 4 The property is currently operated as a dairy farm and is located within the Ashburton-Lyndhurst Groundwater Zone, as defined in the Proposed Natural Resources Regional Plan (PNRRP).

Priority

- 5 I note that a number of other applications to take groundwater from within the Ashburton-Lyndhurst zone have recently been heard (November 2010). I was also a member of that hearing

panel. This application has higher priority than one of the applications in the earlier hearing (application CRC103498 by Mr OA Gould), but lower priority, in terms of notifiability and application date, than the other 14 applications. As the hearing for the Lovett's application was more straightforward than the earlier hearing this decision has been completed first. The effect of this on the applicants with higher priority must therefore be considered.

- 6 As discussed below, the groundwater zone is currently over-allocated. However, evidence was presented by Mr Thorley, at both this hearing and the hearing for the earlier applications, that sufficient water is available to grant all applications. While I cannot comment on the decision for the 14 applicants with higher priority, I am satisfied from my consideration of Mr Thorley's evidence that the availability of water is not a bar to granting this application, taking into account the earlier applications. The priority order of the applicants is therefore of no concern and the release of this decision ahead of the others should not compromise their situation.

Ashburton-Lyndhurst Groundwater Zone

- 7 The Ashburton Lyndhurst Groundwater Zone is one of 26 groundwater allocation zones established by Environment Canterbury for groundwater management purposes.
- 8 The zone is located between the foothills and the coast, with the Ashburton River on its western boundary and a line running approximately between Methven, Chertsey and Pendarves as its eastern boundary. The zone is typical of the Canterbury Plains, with water-bearing gravel layers interspersed with less permeable material. It is unusual in that there are no spring-fed rivers or creeks. The zone does not include the Ashburton River or any flowing sections of Wakanui Creek.
- 9 The Ashburton Lyndhurst Irrigation Scheme occupies the central portion of the zone. This provides water from the Rangitata and Ashburton Rivers, via the Rangitata Diversion Race, for irrigation of land between approximately Chertsey and State Highway 1. Land has traditionally been irrigated via border-dykes, however there is a gradual trend to convert to the more efficient spray irrigation. At the same time, some of the scheme's canals have been replaced by a piped pressurised supply, reducing leakage of water to groundwater.
- 10 Variation 4 of the PNRRP (notified 23 June 2007) established a groundwater allocation limit of 126.6 million cubic metres for the zone (Schedule WQN4). This was based on 50% of the average annual land-surface recharge, additional recharge from groundwater allocation and additional recharge from surface water irrigation (the Ashburton Lyndhurst Irrigation Scheme).
- 11 In 2010, further work by ECan¹ determined that the recharge from surface water irrigation had been under-estimated by approximately 20 million cubic metres. If the same 50% threshold for recharge was applied in determining the allocation limit, then a further 10 million cubic metres of water would be available for allocation.
- 12 The existing allocation limit in the PNRRP is 126.6 million cubic metres per year. At present, 127.255 million has been allocated, with a further 8.089 million cubic metres, including this application, in process.

NOTIFICATION AND SUBMISSIONS

- 13 The application was publicly notified on 30 October 2010, as follows:

Applicant: TW & BM Lovett

Ashburton – Lyndhurst Groundwater Zone

¹ Thorley, MJ, Bidwell, VJ and Scott, DM 2010. Land-surface recharge and groundwater dynamics – Rakaia-Ashburton Plains. Environment Canterbury Technical Report U09/55.

CRC102937 – increase the total volume of groundwater taken and used under resource consent CRC030700.1 from the following three bores at Fairfield Road, Newlands, Ashburton:

1. Bore L37/1144, 300 millimetres diameter and 86 metres deep, at map reference NZMS 260 L37:2037-9848;
2. Bore L37/0255, 300 millimetres diameter and 69 metres deep, at map reference NZMS 260 L37:1780-0041;
3. Bore L37/0198, 300 millimetres diameter and 68 metres deep, at map reference NZMS 260 L37:1972-9837.

This application is to increase the total volume of water abstracted from 1,274,050 cubic metres per year to 1,434,050 cubic metres per year (an increase of 160,000 cubic metres per year).

A consent duration to 23 June 2038 is requested for the above consent. This is the same expiry date as the existing resource consent (CRC030070.1).

Submissions

- 14 Three submissions were received. One, from DR Storrier, was in support. No reasons were given. A submission by Singletree Dairies opposed the application on the basis of potential well interference and requested an aquifer test be carried out.
- 15 A submission by Silver Fern Farms was also in opposition. This raised concerns about cumulative effects on groundwater levels as a result of additional abstraction. It notes that report R09/55, which is quoted in the application as supporting additional abstraction from the zone, states that additional abstraction is available only if further irrigation development above State Highway 1 is primarily sourced from surface water. The submitter considers that if additional groundwater is available within the zone, then restrictions should be lifted giving all landowners equal opportunity to make applications.
- 16 No submitters appeared at the hearing.

SITE VISIT

- 17 I did not undertake a site visit as I am familiar with the general area.

ISSUES AND CONSIDERATION

Status of the applications

- 18 There was no dispute that the taking of water is classed as a non-complying activity under the Proposed Natural Resources Regional Plan (PNRRP) as the allocation limit for the zone has been exceeded. The use of water is permitted under the PNRRP as the volume is less than allowed under Schedule WQN9, however the activity is innominate (and therefore discretionary) under the Transitional Regional Plan (TRP).
- 19 Ms Penman advised that the activities are sufficiently related to be 'bundled' together in terms of status, following the approach in *Tairua Marine Limited v Waikato Regional Council*², hence the overall status is non-complying.

New application or change of conditions?

- 20 The application is for an increase in annual volume with no change to the instantaneous rate or any other conditions. There was some discussion at the hearing as to whether the application

² High Court CIV-2005-485-1490

was for a change of conditions (as intended by the applicant) or a new application for additional water (as determined by ECan officers).

- 21 There appears to be no dispute that the application is only for extra water – that is, only the effects of taking the extra water can be considered. The effects of the existing allocation are part of the baseline environment and not subject to reconsideration. Mr Talbot argued that the application was made as a change of conditions and should be treated as such, whereas ECan considered the application was 'beyond the scope' of the original application. Mr Talbot stated that the effects of a change of conditions must be 'material' for it to be considered beyond the scope of the existing consent. In support of this, he provided a memorandum³ written by Bianca Sullivan, Environment Canterbury Principal Consents Officer. Mr Talbot stated that as the direct well interference effects are negligible, and the cumulative effects minor due to there being additional water available from the allocation zone (with appropriate mitigating conditions), then the application should be considered a change of conditions.
- 22 Ms Sullivan's memo states that case law⁴ dictates that an application should be treated as a new activity where the variation would result in:
 - (a) A fundamentally different activity from that originally consented; or
 - (b) An activity having materially different adverse effects; or
 - (c) An activity that seeks to expand or extend the original activity.
- 23 The memo notes that the change must be compared to the original activity for which consent was granted, rather than to any subsequent changes to that consent.
- 24 The original consent (granted 2003) authorised the taking and use of water for the purposes of irrigating crops and pasture, excluding milking dairy cattle. No annual volume was included on the consent. A change of land use to allow dairying, with its greater demand for water, was granted in 2008. At that stage an annual volume was included in the consent conditions, however this volume appears to be sufficient only for an arable operation not an intensive pasture operation. The reasons for this are not clear.
- 25 The memo goes on to note that changes to an activity are measured by their environmental effects and the key test is therefore whether the effects are materially different. Ms Sullivan lists some examples of effects that would be likely to be materially different. These include an increase in annual volume in a 'red' (fully allocated) zone, which would generally result in significant cumulative effects. She notes that in situations where consents do not have an annual volume condition, information provided for the original activity would be used to derive an annual volume.
- 26 The application is for additional water in a highly allocated groundwater zone. While Mr Thorley's report identifies that additional water may be taken within the zone, it is a subject to a number of provisos, discussed more fully below. Mr Thorley identifies as risks of further groundwater development within the zone saltwater intrusion and reliability of supply for existing groundwater users. The adverse effects are therefore potentially more than minor, particularly over the longer term.
- 27 In my opinion, the application clearly extends the original activity and may result in additional adverse effects. I therefore consider it should be treated as a new application.
- 28 I sought advice from Ms Penman as to whether the additional volume, if treated as a new application, should be dealt with as a separate consent or incorporated into a consent with the existing volume (that is as a new consent, rather than a change to the existing one). Her opinion was that for administrative purposes and ease of monitoring, the additional volume should be included with the existing allocation in a single consent document. This does not preclude conditions relating purely to the new volume being included, however it would be inappropriate to

³ Memo from Bianca Sullivan, Principal Consents Advisor, to Water Consultants, entitled 'Change of conditions for water consents'. Date unknown.

⁴ Body Corporate 970101 v Auckland CC (2000) 6 ELRNZ 183; [2000] NZRMA 202 (HC)

alter any of the conditions relating to the existing volume. The only changes made to those conditions are to their order.

- 29 The applicant has proposed the same conditions that are attached to existing consent CRC030700.1 for the new volume of water, with the exception of an additional condition relating to saltwater intrusion.

Effects on the environment

- 30 The effects to be considered are those that relate only to the additional volume of water to be taken. Ms Penman listed several potential effects of groundwater abstractions which she discussed only briefly. These were:
- (a) Adverse effects on aquifer stability – there will be no change to the risk of stability as there is no change to the rate of take or any increase in the number of bores.
 - (b) Adverse effects of cross-connection on groundwater quality. A condition requiring backflow prevention is proposed for the consent.
 - (c) Adverse effects on surface water flows. There are no streams or rivers in the vicinity of the take, and no spring-fed streams in the groundwater zones.

Other potential effects are discussed below.

Efficient use of water

- 31 Policy 3 of Chapter 9 of the RPS seeks to *'promote efficiency in the use of water'*. Efficiency involves both a technical evaluation and an evaluation of allocative efficiency. Policy 6 directs the consent authority to, amongst other things, base water permits on actual and reasonable water needs.
- 32 Objective WQN5 of the PNRRP is to *'Achieve a high level of efficiency in terms of resource availability and the use of water'*. Policy WQN17 follows on from this, seeking to ensure that:
- '(a) the instantaneous rate of abstraction, the return period and the annual volume are specified as conditions of water permits and are no more than reasonable for the intended end use;*
 - (b) significant wastage of water is avoided...'*

- 33 Ms Penman calculated the amount that would be allowed under Schedule WQN9 of the PNRRP (as amended by decisions) as 2,155,185 cubic metres per year. Since the total volume (the existing allocation plus the additional volume applied for) is rather less than this (1,434,050 cubic metres / year) I conclude that the increase is reasonable and represents an efficient use of water. Consent conditions require that water use is monitored and that water is not wasted.

Well interference

- 34 Policies 5 and 6 of Chapter 9 of the RPS both stress the importance of providing for existing users when granting resource consents. In relation to existing groundwater users, this is reflected in Objective WQN5 of the PNRRP, which is to: *'Ensure that groundwater abstractions from new bores, in conjunction with all other abstraction from existing bores, do not significantly affect the yield from neighbouring bores that are adequately penetrating the aquifer.'*
- 35 Policy WQN20 sets out the method by which this will be achieved. Following some discussion at the hearing, additional well interference assessments were provided by the applicant as further information. Conservative inputs into the assessment model were agreed between Mr Talbot and Mr Thorley. The assessments showed that the additional drawdown resulting from the extra volume, compared to the drawdown that might occur under the existing consent, was negligible, and in every case less within the thresholds of Policy WQN20.

- 36 The additional effect on Singletree Dairies, who submitted on the basis of well interference, was calculated to be zero. I am satisfied that the effects are minor and within the scope of the plan and there is no need for an aquifer test to confirm this finding.

Cumulative effects on groundwater levels within the zone

- 37 As discussed above, this application falls outside the allocation limit within the PNRRP. However, additional work by ECan has identified that there is sufficient water available to allocate a further 10 million cubic metres per year. This application, and those from within this zone heard in November 2010, all fall within this new unofficial limit.

- 38 The need to allow use of the groundwater resource, while preventing over-allocation of water, is clearly laid out PNRRP. Objective WQN3 is to:

'Enable present and future generations to gain access to the region's groundwater resources for social, economic, cultural and other benefits while ensuring that: ...

(b) the cumulative effects of groundwater abstractions do not cause a significant continuing long-term decline in groundwater levels and artesian pressures in each aquifer; ...'

- 39 This is reflected in Policy WQN9, which is to control the total amount of water allocated so there is not a significant continuing long-term decline in mean annual groundwater levels and artesian pressures.

- 40 Mr Thorley's evidence explains that within the zone *'Groundwater abstraction does play a role in the seasonal dynamic changes and, to a lesser degree, the longer-term trend in groundwater levels. However, the ALIS is a major contributor of [land surface recharge] to the Ashburton-Lyndhurst slice and buffers the effects of groundwater abstraction whilst supplying a significant component of the irrigation supply across the upland area.'*

- 41 However, he also points out:

'If the ALIS area was converted to spray irrigation, recharge would decrease and could cause significant reduction in groundwater levels in the vicinity of the ALIS. This could be partially counter-balanced by increasing the area over which the ALIS supplies surface water for irrigation.'

- 42 The Thorley *et al* 2010 report notes that irrigation methods within the scheme have progressively improved, from border-dyke to spray. The extent and speed of conversion of the ALIS to spray irrigation is not known. However, it is clear that as development occurs surface-water recharge, upon which the additional allocation is based, will decrease. In addition, Mr Thorley notes that:

'Observation bores throughout the zone have recorded increased summer drawdown and subsequent reducing winter levels over the last 10 years. This effect has been attributed to increased abstractions in the zone and climate. ... With existing consents becoming more fully implemented over time (as farm plans are developed, or more wells drilled to meet consented volume), it can be expected that groundwater levels will be further reduced.'

- 43 There are therefore risks to allocating additional water and it cannot be assumed that effects will necessarily be minor over the longer term. In the face of this uncertainty, it is prudent to grant any consent to take water from the increased allocation limit for a relatively short duration.

- 44 A further risk of increased groundwater usage and reduced recharge, identified in Mr Thorley's evidence, is that of saltwater intrusion at the coast. While there is no evidence of saline intrusion at present, Mr Thorley notes that groundwater levels in the Kyle coastal monitoring wells have commonly been below the minimum level of 1.5 metres above mean sea level, required to be maintained under Policy WQN11 of the PNRRP.

- 45 Mr Thorley recommends that a trigger level system be developed, based on peizometric levels and salinity thresholds that would trigger restrictions if breached. In her s42A report, Ms Penman

recommended a condition that the take should cease if water samples exceeded an electrical conductivity of 150 mS/m. The applicant accepted this condition.

Effects on groundwater quality

- 46 Objective 3 of Chapter 9 of the RPS enables present and future generations to benefit from the water quality on Canterbury's water bodies while safeguarding their existing and intrinsic values. Land uses which maintain or enhance water quality should be promoted (Policy 11).
- 47 Objective 3 is expanded upon in the PNRRP. Objective WQL2.1(2) of that document is to maintain groundwater quality such that:
- (a) *'If, during the life of this plan, the overall maximum nitrate-nitrogen concentration exceeds 5.6 milligrams per litre in any aquifer, any increase in nitrate-nitrogen concentration shall not exceed a rate of 1.5 milligrams per litre every ten years. This rate shall be based on the overall maximum concentration measured or reasonably deduced in an aquifer in the three years prior to 1 November 2010.*
 - (b) *'Notwithstanding (a) above, the overall maximum nitrate-nitrogen concentration in any aquifer shall not exceed 11.3 milligrams per litre. ...'*
- 48 Policy WQL9 is to minimise the leaching of nutrients, chemical and microbiological contaminants to groundwater by requiring the use of best management practices to:
- (a) *"manage the input of nitrogen so that it matches plant requirements; and*
 - (b) *avoid the accumulation of nitrogen or other contaminants in the soils which have a high potential for leaching, especially during autumn and winter; and*
 - (c) *limit the loss of contaminants from the soil profile to groundwater.:"*
- 49 In this situation, the contaminant of greatest concern is nitrate-nitrogen.
- 50 The existing consent allows for water to be used for intensive dairying and is subject to a nitrate management condition. There will be no change in land use and the increase in annual volume represents a small proportion of total water use. Ms Penman indicated, on the basis of comments made to her by Mr Carl Hanson, ECan Groundwater Scientist, that there is unlikely to be an increase in leaching from the property.
- 51 Mr Lovett indicated that his domestic well was regularly monitored for water quality and levels were low, although no data were provided. It is well known that there are persistent high nitrate levels across parts of the Ashburton Lyndhurst groundwater zone below SH1, which are no doubt due in part to the cumulative effects of existing intensive farming operations, as well as in some areas discharge from meat processing works. Whilst I have concerns in general about additional leachate of nitrate in this zone I am satisfied that the additional effect from this application will be very small. The volume sought is one of the smallest of the recent applications for water from the zone.
- 52 The condition on the existing consent requiring modelling of nitrate leachate, management practices to minimise the loss of nitrate-nitrogen from the root zone, and preparation of a farm management plan, will apply to the new volume as well the existing allocation.

Positive effects

- 53 Granting the application will improve reliability of supply for the Lovetts in their farming operation. They are currently at a disadvantage at having to cease irrigation prior to other dairy farmers in their area.

Section 104

- 54 Section 104(1) requires that, subject to Part II of the Act, regard must be had to:

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

- 55 The potential effects and the relevant provisions of the planning documents have been discussed above.
- 56 There are no relevant operative national policy statements. The New Zealand Coastal Policy Statement does not apply.
- 57 The Resource Management (Measuring and Reporting of Water Takes) Regulation 2010 came into force on 10 November 2010. The metering condition on the consent is consistent with the regulations.

Section 104D

- 58 Since the activities are non-complying, the threshold test in section 104D applies. I am satisfied that the effects of the activity will be minor, but only for a period of 10 years, not the 27 years sought by the applicant.
- 59 In terms of relevant plan provisions, Policy WQN14.2(2)(d)(iii) allows for the taking of water in excess of a groundwater allocation block determined using Schedule WQN4, only where it can be demonstrated that the proposal, in combination with all other takes from the water body, will not compromise the environmental values sustained by groundwater levels or the reliability of supply provided for in Policy WQN14.1(7). There are no rivers or springs likely to be affected. Reliability of supply to other users in the longer term, however, is not guaranteed, given the uncertainty surrounding the supply of surface water to the zone via the Ashburton-Lyndhurst Irrigation Scheme. I consider the application is consistent with this policy only in the short to medium term.
- 60 The application is consistent with other policy provisions.

PART II OF THE RESOURCE MANAGEMENT ACT 1991

- 61 The purpose of the Act is to promote the sustainable management of natural and physical resources. Sustainable management involves managing the use, development and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic and cultural well-being and for their health and safety.
- 62 However, the Act promotes the use and development of natural resources only while (s5):
- (a) *sustaining the potential of natural and physical resources ... to meet the reasonably foreseeable needs of future generations; and*
 - (b) *safeguarding the life-supporting capacity of air, water, soil and ecosystems; and*
 - (c) *avoiding, remedying or mitigating any adverse effects of activities on the environment.*
- 63 The effects of the groundwater take have been discussed above. I consider that with conditions in place, effects on the environment will be minor over the short term. They will not necessarily be minor over the longer-term term. In the short term, the proposal represents sustainable use of the water resource.

Section 6 and 7

64 I do not consider any matters in sections 6 and 7 will be compromised by granting the consents sought. The proposal represents efficient use and development of the water resource.

Section 8

65 Section 8 requires us to take into account the principles of the Treaty of Waitangi. Neither paptipu runanga nor Te Runanga o Ngai Tahu submitted on the applications. There are no surface water resources within the zone. Effects on groundwater quality will be minor and there will be no effects on surface water resources. I conclude that the applications are unlikely to affect values of significance to iwi.

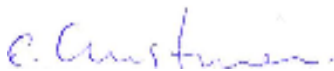
66 Overall, I consider that granting this application, with the conditions below, will achieve the overall purpose of the Act.

DURATION

67 The applicant sought an expiry date of 23 June 2038, to be consistent with the existing consent CRC030700.1. Since this consent incorporates the allocation previously taken under CRC030700.1, the expiry date remains the same. However, in regard to the increase in allocation sought, while I understand the desire for the same expiry date, I do not consider a 27 year duration is justified in this instance. As discussed earlier, there are significant concerns about the long-term availability of recharge water from the ALIS, given the ongoing conversion of border-dyke irrigation to spray. The gradual piping of the scheme will further reduce recharge from races and storage ponds.

68 While I accept Mr Thorley's evidence that there is sufficient additional water within the zone at present to grant this application, I am not confident that this situation will persist over the long-term. I therefore consider that ten years is the maximum duration for which the additional water may be taken. The applicant should be aware that there is no certainty of renewal should an application be made for this volume after that period. The available groundwater resources and demand within the zone will need to reassessed at that stage.

DATED the 22 day February 2011



E Christmas, Commissioner

Annexure 1 – Conditions of Resource Consent CRC102937

CRC102937 To take and use groundwater

1. Water may be taken only from bore L37/1144, 300 millimetres diameter and 86 metres deep, at map reference NZMS 260 L37:2037-9848, bore L37/0225, 300 millimetres diameter and 69 metres deep, at map reference NZMS 260 L37:1780-0041, and bore L37/0198, 300 millimetres diameter and 68 metres deep, at map reference NZMS 260 L37:1972-9837.
2. Water may be taken:
 - (a) from bore L37/1144 at a rate not exceeding 50 litres per second, with a volume not exceeding 41,400 cubic metres in any period of ten consecutive days; and
 - (b) from bore L37/0225 at a rate not exceeding 84 litres per second, with a volume not exceeding 69,552 cubic metres in any period of ten consecutive days; and
 - (c) from bore L37/0198 at a rate not exceeding 48 litres per second with a volume not exceeding 39,744 cubic metres in any period of ten consecutive days.
3.
 - (a) For the period effective immediately and expiring on 30 June 2021, a combined volume from all three bores of 1,434,050 cubic metres of water may be taken between 1st July in any year and the following 30 June.
 - (b) For the period from 1 July 2021 until the expiry of this consent, a combined volume from all three bores of 1,274,050 cubic metres of water may be taken between 1st July of any year and the following 30 June.
4. Water shall only be used for irrigation of crops and pasture, on the area of land shown in attached plan CRC102937, which forms part of this consent.
5. Prior to taking water under this consent, consent CRC030070.1 shall be surrendered.
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, within 12 months of the commencement of this consent, install, or provide for the installation of:
 - (a) An easily accessible straight pipe, of a length at least 15 times the diameter of the pipe, or
 - (b) A water flow measurement device which will measure the rate at which water is taken to within an accuracy of plus or minus five percent as part of the pump outlet plumbing or within the mainline distribution system.
8. The consent holder shall before 1st September 2008:

(a)

(i) install a water meter(s) that has an international accreditation or equivalent New Zealand calibration endorsement, and has pulse output, suitable for use with an electronic recording device, which will measure the rate and the volume of water taken to within an accuracy of plus or minus five percent as part of the pump outlet plumbing, or within the mainline distribution system, at a location(s) that will ensure the total take of water is measured; and

(ii) install a tamper-proof electronic recording device such as a data logger(s) that shall time stamp a pulse from the flow meter at least once every 60 minutes, and have the capacity to hold at least one season's data of water taken as specified in clauses (b)(i) and (b)(ii), or which is telemetered, as specified in clause (b).

(b) The recording device(s) shall:

(i) 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

(ii) store the entire season's data in each 12 month period from 1 July to 30 June in the following year, which the consent holder shall then download and store in a commonly used format and provide to the Canterbury Regional Council upon request in a form and to a standard specified in writing by the Canterbury Regional Council; or

(iii) shall be connected to a telemetry system which collects and stores all of the data continuously with an independent network provider who will make that data available in a commonly used format at all times to the Canterbury Regional Council and the consent holder. No data in the recording device(s) shall be deliberately changed or deleted.

(c) The water meter and recording device(s) shall be accessible to the Canterbury Regional Council at all times for inspection and/or data retrieval.

(d) The water meter and recording device(s) shall be installed and maintained throughout the duration of the consent in accordance with the manufacturer's instructions.

(e) All practicable measures shall be taken to ensure that the water meter and recording device(s) are fully functional at all times.

9. Within one month of the installation of the measuring or recording device(s), or any subsequent replacement measuring or recording device(s), and at five-yearly intervals thereafter, and at any time when requested by the Canterbury Regional Council, the consent holder shall provide a certificate to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, signed by a suitably qualified person certifying, and demonstrating by means of a clear diagram, that:

(a) The measuring and recording device(s) has been installed in accordance with the manufacturers specifications; and

(b) Data from the recording device(s) can be readily accessed and/or retrieved in accordance with clauses (b) and (c) of Condition (8).

10.

(a) The irrigation system used in association with taking water from bores L37/1144, L37/0225 and L37/0198 shall not be used to distribute effluent, fertiliser or any other added

contaminant, unless a reduced pressure zone backflow preventer is installed within the pump outlet plumbing or within the mainline to prevent the backflow of water into the bore.

(b) The backflow preventer shall be tested within one month of its installation and annually thereafter by a suitably qualified person. A test report shall be provided to the Canterbury Regional Council within two weeks of each inspection.

11.

(a)

(i) With the exception of the first period ending 30 June that this consent is exercised, for each preceding 12 month period ending 30 June each year and for the following irrigation season, an approved method shall be used to calculate the nitrate-nitrogen concentration in the soil drainage water below the plant root zone and to prepare a 'nutrient budget' for the subject land for that prior 12 month period.

(ii) Management practices shall be implemented to minimise the loss of nitrate-nitrogen in the soil below the root zone.

(b) A record of the measured and estimated input data and calculations undertaken in accordance with clause (a) shall be:

(i) prepared by 31 August each year;

(ii) certified as an accurate record by a person who can demonstrate competency in agricultural management;

(iii) maintained for the property for the duration of the consent; and

(iv) provided to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, by 30 September each year.

(c) The following records shall be kept for each irrigated block and made available to the Canterbury Regional Council on request:

(i) timing and rate of irrigation applications;

(ii) timing and rate of nitrogen fertiliser applications, including dairy shed effluent applications;

(iii) timing and rate of nitrification inhibitor applications;

(iv) stocking rates (number and type of animals) on a monthly basis;

(v) timing of cultivation activities and crops/pasture planted; and

(d) For the purposes of this condition an 'approved method' is:

(i) the most recent version of the 'OVERSEER' (AgResearch) model for pastoral, crop and horticultural land;

(ii) the most recent version of the Soil Plant Atmosphere Model (SPASMO-HortResearch) for horticultural land; and

(iii) any other method approved by the Canterbury Regional Council.

12. The consent holder shall, prior to the use of water for irrigating dairy pasture, provide a copy of an individual Farm Management Plan (FMP) to the Canterbury Regional Council which shall address at a minimum how the individual farm will implement practicable steps to:
 - (a) Ensure water is used in a technically efficient manner; and
 - (b) Minimise nutrient losses from the property.
13.
 - (a) Compliance with the individual Farm Management Plan shall be assessed annually by a suitably qualified person. If any non-compliance is noted, the consent holder shall remedy the non-compliance within one month.
 - (b) A copy of all compliance assessments shall be forwarded to the Canterbury Regional Council, upon request.
14. Saltwater intrusion
 - (a) Following any sample of water from any of bores L37/0867, L37/0693 and L37/1713, or from any replacement monitoring bores installed at the coast between Inverrose Road and Chertsey Kyle Road, having a measured electrical conductivity of 150 mS/m or more, the maximum volume of water which may be taken in terms of this permit shall not exceed 1,274,050 cubic metres per year.
 - (b) On request, and at the cost of the person making the request, the Canterbury Regional Council may take and analyse samples from the monitoring bores, in addition to the Canterbury Regional Council's twice-yearly monitoring programme.
 - (c) The taking of additional water, up to the annual limit set in this consent, may only commence following two consecutive samples of water, taken at least one week apart, from all bores within the monitoring site where all samples taken have a measured electrical conductivity of less than 150 mS/m, as measured by the Canterbury Regional Council.
15. The Canterbury Regional Council may, on any of the last five working days of June each year, serve notice of its intention to review the conditions of this consent for the purpose of dealing with any adverse effect on the environment which may arise from the exercise of the consent and which it is appropriate to deal with at a later stage.

Expiry date: 23 June 2038

Irrigation Plan for CRC102937

