

**IN THE MATTER OF**

Resource Consent applications under the Resource Management Act by Wongan Hills Limited to take and use groundwater from five bores for irrigation in the Kaituna Valley

**DECISION OF THE HEARING COMMISSIONER**

The Hearing took place on Thursday 3 February 2011 in the offices of the Canterbury Regional Council, 58 Kilmore Street, Christchurch.

**HEARING COMMISSIONER:** Mr John D Talbot

**APPEARANCES**

**The Applicant**

Messrs Brent and David Thomas for Wongan Hills Ltd

Dr Tony Davoren (consultant)

Mr David Hendrikz (consultant)

Mr Julian Weir (consultant)

**Submitters**

Mr Praveen Krishnan Menon

Mr Terry Leonard Clancy

Mrs Pam Young and her son Mr Marc Young

Ms Rachel Mary Hamblyn

**Investigating Officer**

Dr Philip Burge (Consents Investigating Officer)

**DATE OF DECISION: 14 February 2011**

## **INTRODUCTION**

1. This is the decision of the Hearing Commissioner, Mr John D Talbot, appointed by the Canterbury Regional Council (“CRC”) to hear and decide any preliminary matters and the application by Wangan Hills Limited for water permits to take and use groundwater.
2. Prior to the Hearing commencing, a preliminary matter was dealt with relating to a potentially affected party who was not provided the opportunity to submit on the application. Attached as Annexure A is the record of this matter.
3. At the beginning of the hearing the Commissioner asked the parties present if they had received all the relevant information (particularly the s42A Officer’s Report), and whether there were any issues relating to conflicts of interest or other jurisdictional matters. All parties were satisfied on all these matters.
4. The Commissioner also made reference to the Hearing Rules of Procedures and Order of Proceedings and, while the Hearing would be conducted in accordance with those procedures, it was the Commissioner’s intention to not be overly formal.

## **THE APPLICATION AND NOTIFICATION**

5. The application was lodged with the CRC on 6 August 2010 and appears to have been receipted under s88(3) on the same day. Prior to the decision on notification, the application was amended several times. The final form of the application as notified was:

CRC103935 – to take and use groundwater from:

- Bore M36/20408, 300 millimetres diameter and 88.75 metres deep, at map reference NZMS 260 M36:85122-18478, at a maximum rate of 20 litres per second and 1,728 cubic metres per day;
- Bore M36/20409, 300 millimetres diameter and 137 metres deep, at map reference NZMS 260 M36:83938-16024, at a maximum rate of 30 litres per second and 2,592 cubic metres per day;

- Bore M36/20411, 300 millimetres diameter and 116.5 metres deep, at map reference NZMS 260 M36:83636-16576, at a maximum rate of 90 litres per second and 7,766 cubic metres per day;
- Bore M36/1344, 200 millimetres diameter and 30.2 metres deep, at map reference NZMS 260 M36:84390-16565, at a maximum rate of 11.5 litres per second and 994 cubic metres per day;
- Bore M36/3988, 200 millimetres diameter and 51.2 metres deep, at map reference NZMS 260 M36:84395-16562, at a maximum rate of 11.5 litres per second and 994 cubic metres per day;

with a combined maximum rate of take from all sources of 163 litres per second and an annual volume from all sources of 918,400 cubic metres. Water will be used for the irrigation of 280 hectares of pasture for grazing stock on the applicant's property located at Kaituna Valley Road, RD 2, Christchurch 7672. A consent duration of 10 years is sought. The application is for a new take.

6. It is noted that bores M36/1344 and M36/3988 are currently consented by consents CRC940557 and CRC940558 respectively. These consents will be retained in addition to the bores being incorporated into the new consent should the new application be granted as sought. It was the applicant's intention that there would be a condition requiring any new consent to not be exercised concurrently with the existing consents. It is noted that the existing consents for these two bores authorise the same rates of abstraction as the new application.
7. The application was limited notified to five bore owners in Kaituna Valley (Clancy, Young, Menon, Hamblyn/Kennedy, and the Christchurch City Council). The closing date for submissions was Monday 6 December 2010. Four submissions were received, all in opposition.
8. As a result of the preliminary matter dealt with prior to the Hearing (Annexure A), the application was amended. At the Hearing, the applicant further amended the application, with the amendment to the rates from bore M36/20408 and total annual volume as follows:

- Bore M36/20408, 300 millimetres diameter and 88.75 metres deep, at map reference NZMS 260 M36:85122-18478, at a maximum rate of 16.5 litres per second and 1,426 cubic metres per day, and a maximum annual volume of 123,120 cubic metres;

with a combined maximum rate of take from the five bores of 159.5 litres per second and a combined maximum annual volume of 1,107,975 cubic metres.

It is considered that the amended application is within the scope of the notified application, and re-notification is not necessary.

## **THE APPLICANT'S CASE**

9. Wongan Hills Ltd was represented at the Hearing by Dr Davoren who confirmed the application as amended (several times during the process leading up to this Hearing and at the Hearing itself) as set out in paragraphs 5 and 8 above. The Thomas family has farmed in the Kaituna Valley for many years, expanding the farm during that time, and now transferring the farm and related consents to Wongan Hills Ltd with David and Brent Thomas as Directors. The new deep bores and consent applications are to increase security of irrigation water supply and productivity for cropping and pasture for grazing stock (excluding milking dairy cows).
10. The AEE supplied with the application described the consultation undertaken with some of the Kaituna Valley bore owners, identified a number of potential effects, assessed those affects against relevant policies and the RMA, and proposed a set of mitigating conditions to address those affects including a consent duration of 10 years. The assessed effects were:
  - a. Adverse effect of take on surrounding groundwater users
  - b. Cumulative effect of take on other groundwater users
  - c. Adverse effect of inefficient take on other groundwater users
  - d. Adverse effect of take on other users from seawater intrusion
  - e. Adverse effect of take on aquifer stability
  - f. Adverse effect from cross-connection on groundwater quality

- g. Adverse effect of take on surface water flows
- h. Adverse effect of use on water quality
- i. Adverse effect on Tangata Whenua values.

11. At the Hearing, Dr Davoren presented further evidence. In addressing the first point, he said that the applicant carried out aquifer pumping tests to assist in the assessment of any potential effects on neighbouring bores (a description of the tests and results was later provided in evidence by Mr Julian Weir). The test analyses were reviewed by Mr Matt Smith, Environment Canterbury hydrogeologist, who agreed with the results (aquifer parameters). Dr Davoren referenced the relevant policy and methodology of the Proposed Natural Resources Regional Plan (PNRRP) to do the subsequent drawdown interference calculations. Part of that methodology requires an assessment of the nature of the aquifers being pumped and whether there is any possible connection between pumped and overlying aquifers (and rivers for stream depletion calculations to assess effects on surface water flows). Dr Davoren described, and was of the opinion that, the geology of the aquifers, observations during the aquifer pumping tests, water quality and chemistry of the aquifers, and response to rainfall, all show that the aquifers are separate and there is no hydraulic connection between them or with surface waters. This is important for the assessment of drawdown interference between deep and shallow bores. Dr Davoren provided the appropriate drawdown interference assessments which, in his view, showed that none of the applicant's three new deep bores will adversely affect any neighbouring bores. However, this was contingent on the rates of abstraction from bore M36/20408 being limited to 16.5 litres per second and 123,120 cubic metres per year. This was the impetus to amend the application as set out in paragraph (8) of this Decision.
12. The cumulative effects of abstracting over a long timeframe were difficult to assess. However, Dr Davoren considered that factors already identified (see paragraph (11) of this Decision) were evidence of little hydraulic connection between the aquifers and therefore it was unlikely that there would be any long-term effects. Dr Davoren tabled an Addendum to his evidence in which he described an attempt to undertake a water balance for the aquifers in the Valley (it was noted that Environment Canterbury had not yet proposed in any plan an annual allocation limit for the Valley's aquifers). Dr Davoren's assessment was that the total current and proposed abstraction from the

Valley's aquifers is sustainable. Notwithstanding all the assessments, Dr Davoren reiterated that he was not absolutely sure that the potential cumulative effects would be minor, and therefore the applicant proposed a number of mitigating conditions. These conditions related to: monitoring groundwater levels in a number of bores, metering of abstractions, water quality and chemistry monitoring, cessation of abstraction whenever water levels in neighbouring bores reached "trigger" levels to ensure those bores were not compromised and continued to provide their domestic/stockwater supplies. While some of this monitoring would be used to restrict abstraction whenever water levels in neighbouring bores were compromised, other data would be of benefit when the new consent was being replaced at its expiry in 10 years time.

13. Dr Davoren described in detail how he calculated his "trigger" levels. A particularly significant criterion was that the "trigger" level is based on the mean 1 September water level, and would be adjusted each year to reflect the additional year's data (this annual adjustment is not agreed by the s42A reporting Officer or the submitters). The values for the several bores' "trigger" levels were provided with measurement from ground level and from top of the bore casing (supplied subsequent to the Hearing, by email on Friday 4 February). Dr Davoren was careful to describe the three different scenarios that could eventuate, i.e. "trigger" levels reached in either or both the shallow bores and/or the deep bores, and the need or not for mitigation via cessation of abstraction from the deep bores. Dr Davoren also proposed that abstraction would recommence only when water levels had recovered sufficiently, as defined by another set of levels.
14. Dr Davoren then described the further mitigation the applicant will provide should the water levels decline and compromise the supply from the submitters' bores. He was careful to describe what he defined as "compromised" by the applicant's proposed abstractions, i.e. trigger levels reached in the applicant's shallow aquifer bores **and** the applicant's deep aquifer bores **and** the water levels in the submitter's bore falls below 5 metres from the top of the casing. This was set out in paragraphs 99 and 104 of Dr Davoren's evidence. The further mitigation would be for the applicant to supply potable standard water up to 10 cubic metres per day.
15. Dr Davoren provided assessments of the efficiency of use of water and showed that the volumes sought were within the PNRRP "permitted activity" volumes. While the

applicant could withdraw the “use” application and rely on the “permitted activity”, it was his intention to continue with the application to obtain a consent.

16. Dr Davoren considered that seawater intrusion was unlikely but proposed a precautionary set of conditions based on conductivity monitoring and cessation of abstraction if it exceeds a cutoff level. The relevant conditions on the applicant’s current shallow bore consents were also sought to be continued, and Dr Davoren noted that these conditions had been in force since 1994 and no problems with seawater intrusion had been identified. He also indicated that the applicant would consider doing the monitoring, sampling and analyses currently required of Environment Canterbury by the current conditions of those consents.
17. Dr Davoren considered that the geology of the aquifers meant that aquifer stability was not an issue.
18. Dr Davoren confirmed that the applicant’s bores were screened in only one aquifer so that cross-connection between aquifers was not an issue.
19. Dr Davoren considered that the aquifer tests, water quality analyses and geology of the strata all supported his view that there was no hydraulic connection between the deep aquifer and surface waters. There would therefore be no stream depletion effect on the Kaituna River.
20. The Dr Davoren considered that the efficient irrigation and good practices would minimise any effects on shallow groundwater quality. However, the applicant will undertake groundwater quality monitoring to verify this conclusion.
21. Dr Davoren considered that the minor effects on flow and quality of surface waters, and the monitoring proposed to be undertaken, meant that there would not be any adverse effects on Tangata Whenua values.
22. The submitters had lodged written submissions which Dr Davoren responded to in his written tabled evidence. He stated that the submitters abstracted groundwater from their individual bores for domestic, stock and firefighting purposes. None had consents for

other uses. He noted that all the submitters had similar concerns which he believed the applicant had addressed through appropriate assessments of effects and mitigation (primarily cessation of abstraction whenever “trigger” levels or conductivity limits were reached, and supply of potable water if the submitters’ bores were “compromised”). Dr Davoren confirmed that the applicant would retain the current consents for the shallow bores, but also wanted these bores to be listed on any new consent covering the deep bores, with an annual allocation from all bores to limit the total abstraction from all bore sources. The same restrictions that are currently on the shallow bore consents would be carried over to any new consent, and there would be a condition not allowing the separate consents to be exercised concurrently.

23. Dr Davoren also responded to the s42A Report that was circulated prior to the Hearing. While he agreed with much of the Officer’s assessments and recommended mitigating conditions, he considered that the Officer’s recommended condition (13) was not workable. He was of the view that the applicant’s proposal to provide potable water to any “compromised” bore was effective (it should be noted here that Dr Burge, the s42A Officer, proposed his condition (13) as a starting point which he hoped would be refined at the Hearing. This is dealt with later in this Decision).
24. Dr Davoren provided a comprehensive list of conditions he considered appropriate to implement the mitigation being proposed by the applicant.

## **SUBMISSIONS**

### **Praveen Krishnan Menon**

25. Mr Menon attended the Hearing in support of his submission in opposition to the application. Rather than presenting his submission, he preferred to rely on Mr Marc Young to cover his points which were in common with all submitters. Mr Menon’s concerns relate to the groundwater level drawdown effects of long-term abstractions on his own bores and he requests that there be measures for the protection of his bores (he currently uses a surface pump) and the groundwater resource. Mr Menon owns two



bores for domestic and stockwater use: bore M36/1436, 91 metres deep; and bore M36/4050, 51.5 metres deep.

26. Mr Menon sets out the measures he believes to be appropriate, i.e. monitoring of bores for water levels and water quality, with cessation of abstraction whenever low water levels or high salinity levels are measured. He referred to such measures already imposed on existing consents (CRC940557 and CRC940558) but considered that the cutoff levels should be more restrictive than what has been proposed by the applicant for the new consent being dealt with at this Hearing. He also considered that the applicant's two shallow bores, M36/1344 and M36/3988 which are already consented under consents CRC940557 and CRC940558, have significant adverse effects on his own bore and seeks the surrender of the consents.
27. He raises a concern about the effects from nearby farming practices on the water quality of his bores (which is currently very high), and suggests that there be a "protection zone" around his bores that excludes intensive farming. He is also concerned about the effects of farming on the water quality of the Kaituna River and Lake Ellesmere/Te Waihora, particularly from the leaching of nutrients and bacteria. He seeks some form of treatment of runoff, such as filters on drains and riparian planting.
28. Mr Menon also considers that there will be adverse visual effects of the centre-pivot irrigator, and asks for some mitigation by way of planting.

### **Terry Leonard Clancy**

29. Mr Clancy attended the Hearing in support of his submission in opposition to the application. Rather than presenting his submission, he preferred to rely on Mr Marc Young to cover his points which were in common with all submitters. Mr Clancy's concerns relate to the groundwater level drawdown effects on his own bore and degradation of groundwater quality. Mr Clancy owns a shallow domestic 12 metre deep bore, M36/1427. He states that to date there have been no problems with lack of supply from his bore, and that the quality of the water is currently good. He requests that there be measures for the protection of the quantity and quality of water from his bore. These measures would be:

- a. the surrender of the applicant's two shallow bores, M36/1344 and M36/3988 which are already consented under consents CRC940557 and CRC940558, due to their potential drawdown effects on his domestic bore; and
- b. regular testing of the water quality in his bore by the applicant and in the event of contamination the applicant to install a filter system on his bore; and
- c. in the event of his bore running dry, the applicant to provide domestic water.

**Rachel Mary Hamblyn**

30. Ms Hamblyn attended the Hearing on behalf of herself and Mr Kennedy and presented their submission in opposition to the application. Ms Hamblyn's concerns relate to the groundwater level drawdown effects on her own bore and degradation of water quality from intensified farming under irrigation. Ms Hamblyn owns a domestic 18 metre deep bore, M36/3918. She states that to date there have been no problems with lack of supply from her bore, and that the quality of the water is currently good. She requests that there be measures for the protection of the quantity and quality of water from her bore. These measures would be:

- a. the surrender of the applicant's two shallow bores, M36/1344 and M36/3988 which are already consented under consents CRC940557 and CRC940558, due to their potential drawdown effects on her domestic bore; and
- b. appropriate management of farming practices (e.g. fencing stock from accessing a 50 metre zone around her domestic bore) to prevent groundwater quality deterioration along with a water quality monitoring bore and restrictions on contaminant levels, and regular testing of the water quality in her bore by the applicant and in the event of contamination the applicant to install a filter system on her bore; and
- c. imposition of restrictions on abstraction from the applicant's bores similar to those already on consents CRC940557 and CRC940558 to protect the groundwater resource from depletion and salt water intrusion; and
- d. regular monitoring of levels in her domestic bore, the applicant's bores, and other bores; and
- e. an alarm on her bore to prevent pump damage from low water levels and, in the event of her bore running dry, the applicant to provide domestic water.

31. Ms Hamblyn said that the applicant's proposal to supply potable water if her bores were "compromised" was pleasing, and that a low water level of 5 metres was the key trigger level for her bore.

**Mrs Pam and Mr Marc Young**

32. Mrs Young and her son Mr Marc Young attended the Hearing and presented their submission in opposition to the application, although they clarified that they are not opposed to the additional water applied for by Wongan Hills Ltd provided that there are adequate mitigation and protection measures. Mr Young tabled a further document which took into account the s42A Officer's report. The Young's own a 49.8 metre deep domestic bore, M36/1421, which has not failed over the 40 years of its use and still provides an uncontaminated supply. Their concerns relate to effects on the groundwater resource and effects on the supply from their bore and its water quality. The measures requested by the Youngs are:
- a. imposition of restrictions on abstraction from the applicant's bores similar to those already on consents CRC940557 and CRC940558 to protect the groundwater resource from depletion and salt water intrusion (based on water level and salinity monitoring). The Youngs note that in their view these restrictions have protected the shallow aquifer to date; and
  - b. that the baseline for "trigger" levels and salinity be permanently set rather than, in their view, the possibility of these decreasing from year to year if the previous year's values are taken into account to determine the starting point for each succeeding year; and
  - c. monitoring bores should be installed to apply the restrictions and cessation of abstraction rather than using the irrigation bores themselves, and the measurements from all the bores should be telemetered and be available to the submitters on-line; and
  - d. the surrender of the applicant's two shallow bores, M36/1344 and M36/3988 which are already consented under consents CRC940557 and CRC940558, due to their potential drawdown effects on the Young's domestic bore; and
  - e. that irrigation only occur during the summer rather than all year round; and
  - f. in the event of their bore becoming compromised (water level lower than 5 metres below top of casing), the applicant to provide an equivalent quantity of

- water (including for firefighting purposes), although the restrictive conditions should provide complete protection of the resource and their bore supply; and
- g. consideration of staging the applicant's abstraction by allowing a reduced quantity for the first season, which would increase for subsequent seasons only if there were no adverse effects from the previous season's abstraction; and
  - h. monitoring of rivers, wetlands and Lake Ellesmere/Te Waihora water quality to assess any changes due to the increased farming intensity; and
  - i. monitoring the quality of water from their bore should be carried out; and
  - j. review of the consent should their bore become compromised in any way, resulting in more conservative conditions.

33. After hearing the applicant's evidence, Mr Young appeared to be more comfortable with the proposal if the mitigation offered was adopted through consent conditions. However, there were still some concerns as outlined above.

## **SECTION 42A REPORT**

34. Dr Philip Burge provided his s42A Officer's Report to all parties prior to the Hearing. The report provided a background to the application and a description of the existing consents held by the applicant (two groundwater consents to take from two bores, and four surface water consents to take from the Kaituna River). Some of the applicant's existing sources are unreliable, and the application is to add three new deep bores and incorporate the current two shallower bores into the one new groundwater consent (these current consents are CRC940557 and CRC 940558 which will be retained but there will be a "non-concurrent" condition applied to the new consent, if granted). Three of the current surface water consents will remain, and are not part of this Hearing. The other Kaituna River surface take consent, CRC101188, will be surrendered if the new application is granted.
35. Dr Burge provided a summary of the application, notification, submissions, and legal and planning matters primarily concluding that under the Proposed Natural Resources Regional Plan (PNRRP) the "take" is a non-complying activity and the "use" would be

a permitted activity under the most recent version resulting in the suggestion that the consent application for the “use” of water could be withdrawn by the applicant. Because of the timing of the decisions on the PNRRP the “use” would formerly have been and is technically still part of the non-complying status. At the Hearing the applicant clarified that he did not intend to withdraw the “use” application and still sought a consent for this activity.

36. Dr Burge also provided a description of the groundwater environment, based on an MSc Thesis by Namjou (1988) and an investigation by Callander et. al. (1990). Dr Burge recognises that the applicant’s new deep bores intercept a deeper aquifer than identified in those previous studies. He also identifies (with the assistance of Mr Matt Smith, an Environment Canterbury hydrogeologist, and Mr Carl Hanson, an Environment Canterbury water quality scientist) the important issue of whether the deeper aquifer is hydraulically connected to the shallower aquifers, and whether there will be any drawdown interference between the aquifers. They conclude that there could be some connection which contrasts with the applicant’s experts that there is none. That connection is thought by Dr Burge to lead to possible adverse effects of a long-term nature (over an irrigation season or longer) rather than of a short-term nature. The adverse effects would be on both deep and shallow groundwater systems and surface water, i.e. there could be drawdown interference in both deep and shallow neighbouring bores, effects on stream flows, and potential for saltwater intrusion from the sea.
37. Dr Burge then assessed the actual and potential effects of the applications by referencing the relevant provisions of the Regional Policy Statement and Proposed Natural Resources Regional Plan. He was of the opinion that the adverse effects from the following are minor or less than minor:
  - a. Efficiency of the take and use for irrigation (amended annual volume and application rates)
  - b. Aquifer stability (compaction) as a result of abstraction
  - c. Cross-connection of aquifers (each bore screened in only one aquifer, and backflow prevented)
  - d. Water quality effects related to the irrigation “use” of water, i.e. intensification of landuse, where the “use” is a permitted activity or equivalent to a permitted activity then the effects may be disregarded (he also noted that the applicant

could withdraw the “use” application and rely on the permitted activity classification of the PNRRP).

38. Dr Burge’s assessment of the following effects resulted in recommendations for mitigating conditions:

- a. Direct short-term effects (drawdown interference) of the abstraction of groundwater from the applicant’s bores on surrounding bores. Dr Burge detailed the policy requirements of the PNRRP for protecting the water levels in surrounding bores so that those bores may continue to obtain water at the quantities already utilised by the bore owners. He agreed with the drawdown interference calculations (based on the agreed aquifer parameters from the pumping tests) undertaken by the applicant for bores M36/20409 and M36/20411 which showed that the effects would be less than minor. However, for bore M36/20408, Dr Burge’s calculations indicated potential adverse effects which would be mitigated if the rate of abstraction was reduced. The applicant has amended his application to the lower rates therefore the effects would be less than minor. Dr Burge noted that the applicant’s existing bores, M36/1344 and M36/3988 are not subject to change in abstraction rates and there will be no change in effects. He concludes that with the abstraction rates (as amended by the applicant at the Hearing) as conditions of the consent, then drawdown interference effects from all the applicant’s bores will be less than minor.
- b. Long-term cumulative effects (decline in groundwater levels over the long-term, sometimes called sustainability effects over a timeframe of years) of abstraction from the applicant’s bores in combination with all other abstractions. Dr Burge detailed the policy requirements of the PNRRP. He also summarised the applicant’s proposed mitigation which is the monitoring of groundwater levels in several bores and the cessation of pumping if levels decline to identified “trigger” levels in the bores, and the provision of domestic/stockwater to neighbouring properties should their bores be compromised by the applicant’s abstraction.

Dr Burge was assisted by Mr Smith, Environment Canterbury’s hydrogeologist, to assess the proposed “trigger” levels (as amended by the

applicant at the Hearing). Their conclusion was provided via email on the day after the Hearing (as requested by the Commissioner) and was that the proposed “trigger” levels were appropriate to protect the groundwater resource and other users from long-term and cumulative effects of abstractions. Dr Burge recommended that consent conditions be imposed with the applicant’s proposed “trigger” levels, but that the levels be fixed rather than shifting annually. This is dealt with elsewhere in this Decision. Dr Burge also raised the question about when abstraction would recommence following a period of cessation triggered by the “trigger” levels. This was addressed at the Hearing by the applicant. On the matter of provision of water to neighbouring properties, Dr Burge agreed with the applicant’s proposed mitigation as detailed in Dr Davoren’s evidence at the Hearing.

- c. Seawater intrusion into aquifers resulting from pumping. Dr Burge was assisted by Mr Smith, and concluded that abstraction from the applicant’s deep bores would be unlikely to induce seawater intrusion. It was their view that the proposed “trigger” levels would prevent this possibility. As a result, Dr Burge considered that conductivity monitoring in the deep bores was not necessary. Dr Burge did however agree with the applicant’s proposal that the salinity monitoring required under the applicant’s existing consents for the shallow bores be retained for any new consent.
- d. Effects on surface water flows. Dr Burge was of the opinion that because the abstractions from the applicant’s existing shallow bores were not being altered, then there would not be any additional adverse effects on the Kaituna River. However, he was of the view that there could be effects from the abstractions from the new deep bores. Dr Burge recommended that such effects would be mitigated by the “trigger” levels proposed by the applicant.
- e. Effects on Tangata Whenua values. Dr Burge summarised the concerns raised by Te Runanga o Koukourarata and Wairewa Runanga when they were consulted early in the consent application process. Dr Burge noted that all the issues have been dealt with in other sections of his s42A Report, and concluded that effects on Tangata Whenua values are likely to be less than minor providing his recommended mitigating conditions were adopted.

39. Dr Burge then provided an overall assessment of the application against the relevant parts of the RPS, PNRRP, and Part 2 matters of the RMA. He provided the relevant PNRRP policy on the duration of any consent application if granted. His overall conclusion was that, providing the recommended mitigating conditions are adopted then the application may be granted. He considered that the applicant's requested consent duration of 10 years to be appropriate given some uncertainty over the long-term effects. He noted that the review condition would enable any adverse effects arising from the exercise of the consent to be dealt with in the future. Dr Burge then provided a set of conditions, with some amendments at the Hearing, which he recommended be adopted if the application was granted.

#### **RIGHT OF REPLY BY APPLICANT**

40. Dr Davoren conducted the applicant's right of reply at the Hearing, subject to a final comment on the s42A Officer's assessment of the applicant's amended "trigger" levels (this was completed on the day following the Hearing). In summary Dr Davoren was of the view that the submitters' concerns had all been addressed in the applicant's evidence. The principal mitigation measures were the cessation of abstraction whenever "trigger" levels were reached, and the supply of potable water if submitters' bores became "compromised". The applicant did not intend to surrender the current shallow bore consents because if the new deep bores proved to be unreliable for irrigation the applicant would have to continue to rely on the current shallow bores. The "non-concurrent" condition and annual volume condition proposed for the new consent would guard against "double-dipping". Dr Davoren said that the groundwater levels would not decline abruptly, but would gradually decline thereby providing sufficient time to arrange alternative water supplies for the submitters if their bores were "compromised".



## **CLOSURE OF THE HEARING**

41. With the receipt of the additional information from Dr Burge and a response from Dr Davoren on behalf of the applicant, the Hearing closed on Friday 4 February 2011.

## **CONSIDERATION OF THE APPLICATION**

42. The s42A Report comprehensively describes the relevant legal and planning matters, and the applicant did not raise any issues of concern. Therefore, it is not proposed to repeat that in this Decision but to adopt it in accordance with s113(3). Of importance for the applications is that the activities of taking and using groundwater are non-complying.
43. The s42A Report and the AEE and evidence of the applicant identified and assessed all the relevant potential environment effects. These are listed in paragraph (10) of this Decision. Both the applicant and s42A Reporting Officer dealt with all the identified effects in their respective evidence. Of critical importance to these assessments is the description of the aquifer system in the Kaituna Valley and how the various components of the system interact, e.g. effects of pumping from deep aquifers on shallow aquifers and surface streams, effects of pumping from different depth bores on neighbouring bores, whether seawater intrusion is possible. Answering these sorts of questions is totally reliant on an understanding of the aquifer system. Fortunately, there appears to be some good information available about the Kaituna Valley groundwater system, and there was good agreement between the parties about that description, albeit with some provisos about uncertainties. It was, essentially, a case of identifying those matters that remained uncertain and devising appropriate and acceptable conditions to ensure the continued reliability of supply to existing groundwater users and the sustainability of the resource. Where neither of these outcomes was certain to be protected then further mitigating conditions were put forward. At the closure of the Hearing, it was apparent that all parties were close to agreement. The willingness of the parties to find common ground has made the Commissioner's task much easier than it might have been.

However, it is important to record how the Commissioner has arrived at the Decision, and each environmental effect is addressed below.

44. The groundwater system in the Kaituna Valley is a very complex system, however, the descriptions put forward by both the applicant and s42A Reporting Officer are essentially in agreement. I agree with the description.
45. The potential adverse effects from the following are minor or less than minor:
  - a. Efficiency of the take and use for irrigation, with the amended annual volume and application rates, because they meet the PNRRP criteria for a permitted activity (although the applicant does not want to rely on the “permitted” classification and seeks a consent). It is also necessary to ensure any new consent does not operate in conjunction with the current consents to allow more “use” than the calculated efficient “use”. A “non-concurrent” condition was proposed, however, it is considered that the annual volume and rates of abstraction also need to be restricted by way of a condition on the new consent which restricts the combined volume and rates from both the current and new consents.
  - b. Aquifer stability (compaction) as a result of abstraction is not an issue due to the geology of the aquifers.
  - c. Groundwater quality will not be affected from cross-connection of aquifers because each bore is screened in only one aquifer and backflow prevention devices will be fitted.
  - d. There will be no stream depletion effect on the Kaituna River or other surface waters from the abstraction from the deep aquifer. The aquifer tests, water quality analyses and geology of the strata are evidence that there is no hydraulic connection between the deep aquifer and surface waters. In addition, the applicant would reduce the potential effect on flows in the Kaituna River by surrendering current consent CRC101188 which authorises up to 50 litres per second to be taken directly from the River.
  - e. Water quality of shallow groundwater or surface waters will not be adversely affected due to the efficient irrigation and good irrigation management practices that the applicant outlined. While the applicant proposed to undertake

some groundwater quality sampling to monitor for changes in quality, it is considered that this is not necessary.

- f. Adverse effects on Tangata Whenua values would be minor as a consequence of the conditions described in this Decision being attached to the consent.
46. The assessments requiring most attention are related to effects on surrounding groundwater users (drawdown interference), and effects on sustainability of the resource (cumulative, long-term drawdown, seawater intrusion). Most of the evidence presented at the Hearing concentrated on these aspects, and relied on the description of the Valley's aquifer system and pumping tests to determine parameters for drawdown calculations. As already noted in this Decision, the geological description is essentially agreed between the parties, and the results from the aquifer pumping tests have been agreed to derive parameters. This is accepted by the Commissioner.
47. The relevant analyses were provided to estimate the drawdown interference between the applicant's deep bores and surrounding bores. A very conservative assumption was made that all bores were potentially connected, even though there was good evidence that shallow and deep aquifers were likely to be hydraulically separate. At the amended abstraction rates from the three new deep bores, the analyses indicated that drawdowns in surrounding bores would be less than minor. This is accepted by the Commissioner.
48. The assessment of the effects of abstraction from the three new deep bores on the sustainability of the groundwater resource in the Valley was the most contentious and difficult analysis. If the abstraction resulted in long-term decline in groundwater levels (indicating "mining" of the resource) then there would be serious effects on other groundwater users and potential for seawater intrusion or other leakage into the aquifers from the ground surface. These are outcomes that no-one at the Hearing wanted to contemplate. The applicant's consultant put forward several analyses and interpretations to suggest that the proposed abstraction in combination with all other existing abstraction was within the sustainable limits of the aquifers. If this was the case, then there would be no seawater intrusion and no long-term drawdown of groundwater levels which meant that other groundwater users would not be adversely affected by low water levels in their bores. The s42A Officer and submitters were of the view that the analyses

were not that certain, and it is fair to say that the applicant's consultant was not willing to be that certain either. This uncertainty is agreed with by the Commissioner.

49. As a result, the applicant proposed a set of conditions to require cessation of abstraction from the three deep bores whenever groundwater levels were "low" and levels in submitters' bores were "low". This concept is a common approach to protect a groundwater resource and users from long-term declining levels, and was accepted by the s42A Officer and appears to be acceptable to the submitters. The definition of "low" was provided as a set of levels in several bores that would be monitored. The concept and proposed levels are agreed by the Commissioner to protect the sustainability of the Valley's groundwater resource (no long-term decline in levels and no seawater intrusion as a result of the applicant's proposed abstraction). As such, most of the water quality monitoring proposed by the applicant is unnecessary to allow this consent to be granted. One new deep bore is added to the sampling schedule for conductivity measurements (bore M36/20409, 137 metres deep) which, of the three new deep bores, is located lowest down the Valley. However, it may be in the applicant's interests to undertake some further data collection for consideration at the time of expiry and replacement of the consent.
  
50. The water level and quality monitoring required under the existing consents for the shallow irrigation bores and which is carried over to this new consent, should be undertaken by the consent-holder rather than Environment Canterbury. These conditions are amended accordingly. It should be noted that the cessation condition for the shallow irrigation bores still requires cessation **whenever** levels reach the cutoff levels, even though there is now a set timing for the consent-holder to monitor levels. This set timing does not alter the requirement to cease abstraction **whenever** the cutoffs are reached. This means that additional monitoring outside the set timing in the condition may also be applied to require cessation, i.e. there is no change to the current cessation requirements for the two shallow bores. This "continuous" cessation criterion is not applied to the three new deep irrigation bores. Rather, the monthly monitoring required under the conditions sets the timing period to apply the cessation. This is acceptable because of the slow nature of decline in levels.

51. One aspect of the determination of the “low” levels for the deep bores was not agreed by the submitters or s42A Officer. The applicant proposed to re-calculate the level each year to take into account the extra year’s data. There is a possibility that this methodology could result in a lower level from year to year, thereby seemingly to be counter to the intent of the concept. This is accepted by the Commissioner, and the “low” levels will be fixed at the levels proposed by the applicant for 2010/11 and confirmed in an email on 4 February 2011. The staging of the applicant’s irrigation proposal, the short-term 10 year consent duration sought, and the ability to review or apply for a change of conditions, would in the Commissioner’s opinion allow the concept to be refined as more information is collected through the monitoring to be undertaken.
52. While the “low” levels defined for the submitters’ bores are agreed, the additional mitigation proposed by the applicant to supply potable water to the submitters should their bores decline below these levels, is also accepted as a backup solution in the event that the calculations have underestimated the long-term drawdown effects. Such an event should also lead Environment Canterbury to consider a review of the consent conditions.
53. The above evaluation covers all the submitters’ points of concern. They presented a reasoned case for the protection of their water supplies and the applicant responded positively. The Commissioner is confident that the proposed mitigation will protect the groundwater resource and reliability of supply for current users. The additional mitigation of supplying water should bores be compromised is a belt-and-braces approach. However, if this does become necessary then Environment Canterbury should examine the situation and avail itself of the consent review condition. The staging of the applicant’s proposed abstractions will assist with monitoring under a progressive regime rather than abstraction being at its maximum immediately. In addition the short 10-year duration of the consent will also provide an opportunity to re-examine the sustainability of the Valley’s groundwater resource before too much time elapses.
54. One further detail needs to be dealt with and that is which surrounding bores should be protected by the proposed mitigating conditions. The applicant accepts that the four submitters’ bores (five bores in total) should be protected. However, there are two other

bore owners in the Valley, i.e. Christchurch City Council (bore M36/1437) and P&N Hestor-Roe (bores M36/4996 and M36/5308).

55. The CCC was notified of the application but did not lodge a submission, however, the potential adverse effects must be assessed for this bore. The bore is currently used and is in the lower part of the Valley near the four submitters' bores. It would suffer the same effects as the submitters' bores, therefore, the proposed mitigation described in this Decision would also result in an acceptable outcome for this bore.
56. The Hestor-Roes were not notified (see Annexure A) and the bore they utilise would not be affected by direct drawdown. The s42A Officer considered that cumulative drawdowns could affect the bore, and recommended it be included in the proposed mitigation. The bore is located in the upper Valley, and well "up-gradient" of the applicant's proposed abstractions. As such, it is doubtful whether this bore would be adversely affected. However, the applicant has offered the same mitigation of a supply of water. This is accepted by the Commissioner.

## **DURATION OF CONSENT**

57. The applicant has requested a consent duration of 10 years. This is supported by the s42A Officer. The uncertainty around the sustainability of the groundwater resource of the Kaituna Valley (Environment Canterbury has yet to determine a sustainable limit in its regional plan) leads the Commissioner to agree with the 10 year duration.

## **OVERALL JUDGEMENT**

58. In considering the environmental effects of granting the application it is the Commissioner's overall judgement that the purpose and principles of the Resource Management Act can be achieved. The Commissioner is of the opinion that any adverse effects are adequately avoided, remedied and mitigated by the adoption of the consent conditions.

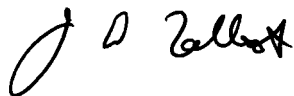
## **DECISION**

59. On behalf of the Canterbury Regional Council, in accordance with the Resource Management Act 1991, it is decided to grant the application CRC103935 by Wangan Hills Limited to take and use groundwater for the duration of 10 years subject to the consent conditions set out in Annexure B.

## **RIGHT OF APPEAL**

60. The parties are advised that there is a right of appeal to the Environment Court which must be lodged within 15 working days of receipt of this Decision.

Dated at Christchurch 14 February 2011

A handwritten signature in black ink, appearing to read "John D Talbot". The signature is written in a cursive style with a large initial "J".

**John D Talbot**  
**Commissioner**

Date: 18 January 2011

CO6C/31609

## MEMORANDUM

**FROM:** Philip Burge

**TO:** The Commissioner

**CC:** Mr Brent Thomas, Dr Tony Davoren, Mr David Hendrikz

**SUBJECT:** CRC103935 – Preliminary Matter: Notice Not Served On Potentially Affected Party

---

1. The notification hearing for this application was held on 3 November 2010. At that hearing I recommended public notification while the applicant proposed limited notification of five bore owners<sup>1</sup>. The decision maker at the notification hearing decided that, in this instance, limited notification was appropriate and that notice should only be served on those parties considered to be potentially affected by the applicant.
2. In the process of drafting my hearing report, however, I noted that applicant did not provide an assessment of well interference for bore M36/20408 as the results of the aquifer test were interpreted as indicating no direct effect on those bores within two kilometres of M36/20408. Mr Smith's comments (see Appendix 1) indicate, however, that the aquifer tests were not conclusive of a complete lack of connection between the deep and shallow bores. I further note that the aquifer parameters determined for bore M36/20408 (in particularly transmissivity) are very different to those for bores M36/20409 and M36/20411, indicating a localised area with very different aquifer characteristics.
3. I therefore assessed the drawdown effect of pumping bore M36/20408 using the parameters derived for that bore (i.e. transmissivity of 100m<sup>2</sup>/day and a storativity of 0.00002) and a conservative Theis assessment. This assessment indicated no significant seven day effect on any of the bores within two kilometres of M36/20408, but did indicate a significant adverse effect (i.e. above the thresholds in Policy WQN20 of the NRRP) over 150 days on bores M36/5308 and M36/4996 (both owned by P & N Hestor-Roe).
4. While Mr Smith's initial comments were primarily referencing the aquifer test on bore M36/20411 this also indicates that the conclusions drawn by the applicant with regard to the aquifer test on M36/20408 may not be valid. Given this uncertainty I decided that, before raising this as a potential issue, I should consult with Mr Smith further. As Mr Smith was on leave until 17 January 2011 I was unable to obtain a comment from him earlier than the 17<sup>th</sup>.

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<sup>1</sup> As specified in an email to me from Mr David Hendrikz, 11 October 2010.



5. Following a discussion with Mr Smith (and see the attached email in Appendix 1), Mr Smith stated that the adverse effect indicated by the well interference assessment on the Hester-Roes is relevant to determining affected parties as there has been a misinterpretation of his comments regarding short- versus long-term effects. In his email of 17 January 2011 (Appendix 1) Mr Smith clarified his position where “short-term” *includes* seasonal effects, and “long-term” effects are the cumulative effects over a period of years.
6. This clarification affects how the adversely affected parties have been determined.
7. A well interference assessment of effects on those parties at the bottom end of the valley (being all those parties currently notified) indicates that, based on a Theis model, effects on these parties from direct well interference are within the acceptable limits specified by Policy WQN20 of the NRRP although I note that cumulative effects over several years may continue to be significant. The Theis assessment of the effects of pumping from bore M36/20408, however, indicates that the Hester-Roes are likely to be affected by direct well interference over the duration of an irrigation season due to the characteristics of the aquifer in the upper valley.
8. As the list provided by the applicant excluded the Hester-Roes (on the basis of the aquifer test), the decision maker at the notification hearing did not include the Hester-Roes in their list of parties to be notified. Given Mr Smith’s recent comments, the results of the Theis assessment, and the general uncertainty regarding the cumulative effects of abstraction, it is my opinion that the Hester-Roes should have been included as an affected party for notification.
9. I note, however, that if the weekly abstraction volume from bore M36/20408 was limited to 9,982 cubic metres (i.e. a Q7 rate of abstraction of 16.5 litres/second), and an annual volume of 123,120 cubic metres (i.e. a Q150 rate of 9.5 litres/second) was imposed on this bore, then direct well interference effects on bore M36/5308 would be reduced to below the threshold specified in Policy WQN20. While the effects on bore M36/4996 would still be above this threshold, it is my understanding that this bore is blocked and therefore unused. Given this, a reduction in the rate and volume of abstraction from this bore to the levels above would reduce direct well interference effects on the Hester-Roes to be less than minor. I further note that a reduction in the rate of abstraction from bore M36/20408 still provides the applicant the ability to pump their entire annual volume.
10. While the mitigation above does not address the uncertain long-term cumulative effects, I further note that the trigger-level mitigation proposed by the applicant is considered by Mr Smith to be sufficient to protect all groundwater users, including the Hester-Roes, from the *cumulative* effects of pumping. In addition the offer of potable water could also be extended to the Hester-Roes in the event that their bore did go dry.
11. Alternatively, if written approval were obtained from the Hester-Roes than any adverse effects on that party must not be considered.
12. In conclusion, I recommend that either:
  - The applicant be invited to adopt the limits on abstraction volumes specified above in order to mitigate direct well interference effects on the Hester-Roes; or
  - That this hearing be delayed to either:
    - allow the Hester-Roes to be notified and provided with the opportunity to submit on this application; or

- to allow the applicant to try and obtain written approvals from the Hester-Roes.

13. I request that the Commissioner consider this matter prior to proceeding to hear this application.



**Date:** 18 January 2011

Philip Burge  
**CONSENTS INVESTIGATING OFFICER**

**Appendix 1 – memorandum and email from Mr Matt Smith,  
CRC Hydrogeologist**



10 December 2010

Ref : CO6C/17650

## MEMORANDUM

**FROM :** MATT SMITH

**TO :** PHILIP BURGE  
cc

**SUBJECT :** CRC103935 – WONGAN HILLS LIMITED – TO TAKE & USE GROUNDWATER

### 1. Aquifer Test on M36/20411

Pumping occurred in the shallow monitoring wells during this test. Because of this pumping a connection with shallow groundwater cannot be discounted. If the aquifers were fully connected I would have expected a response in the shallower monitoring wells similar to the response in well M36/20409, however, even considering the external pumping interference it is apparent that a direct response did not occur.

The test does not provide conclusive evidence that the groundwater systems are completely disconnected, but it does suggest that the direct effects (i.e. short term) from pumping on surface water will be low.

The Theis model gave consistent fits to the observation data and no flow or no-flow boundaries are obvious, that is not to say that they aren't there, but over the short term there is no indication that the Theis drawdown model would not be appropriate for modelling well interference.

### 2. Mitigation

An appropriate trigger in the deep wells will prevent further adverse cumulative effects, if the abstraction ceases. Any further abstraction will only exacerbate the problem.

The deeper system is likely to have a lower storativity, and limited recharge – either directly from outcrops in the valley/banks peninsula or via percolation from shallow groundwater.

The low storativity will mean the deep system will respond to abstraction (and recharge) more readily than the shallow aquifer, as it takes less water (in or out) to the deep aquifer to induce a similar change in the shallow. Therefore I consider the proposed trigger level using the deep well to be conservative.

### 3. Saltwater intrusion

Although these takes are from deep wells, the water levels and distance from the coast mean that significant saltwater intrusion is unlikely. At most there may be some water from lake Ellesmere induced, however there would have to be a significant reduction in groundwater pressure gradients (the deep aquifer is artesian at the lake) in order for any lake water to encroach. The adoption of a trigger level will serve to prevent any significant change in vertical flow direction.

## Philip Burge

---

**From:** Matt Smith  
**Sent:** Monday, 17 January 2011 10:17 a.m.  
**To:** Philip Burge  
**Subject:** TRIM: RE: Wongan Hills - Aquifer Test on M36/20408 (Upper Valley)  
**Follow Up Flag:** Follow up  
**Flag Status:** Completed  
**TRIM Record Number:** C11C/2908

Hi Phil,

Apologies the definition that I was using for short term in the memo was seasonal i.e. less than 6 months, long term was years rather than months.

No problems using Theis for well interference, and this should have included 150 days where no leakage was observed.

Matt

---

**From:** Philip Burge  
**Sent:** Monday, 17 January 2011 9:11  
**To:** Matt Smith  
**Subject:** Wongan Hills - Aquifer Test on M36/20408 (Upper Valley)  
**Importance:** High

Hi Matt

I was sure I'd already sent you a question on this, but can't find the email so it is possible I decided to wait until you came back from leave. Unfortunately I desperately need a reply on the question below as it may result in me having to send a memorandum to the Wongan Hills Hearing Commissioner.

While I was drafting my hearing report I identified that there is another pair of bores, M36/5308 (domestic supply) and M36/4996 (apparently un-used), both owned by P & N Hester-Roe, in the upper valley that are within the 2km radius of M36/20408.

David Hendrikz discounted these bores as affected because the aquifer test as the aquifer test on M36/20408 showed no drawdown in these bores that could be attributed to pumping from M36/20408 and the list of bores that the applicant group considered potentially affected excluded the Hester-Roe's bores. When the decision maker made his decision re limited notification, as the applicant's list of affected parties did not include the Hester-Roe's bores and they were not served notice.

However, I am mindful of your comments re the aquifer tests on M36/20409 and M36/20411 and the possibility of indirect, long term effects as a result of pumping from these bores. Does this comment also apply to the pumping from M36/20408 or is the lack of observable drawdown during the pumping test from M36/20408 sufficient to discount effects particularly given the very low transmissivity of 100m<sup>2</sup>/day in the vicinity of M36/20408?

As I said above, this may be a preliminary matter that needs to be dealt with prior to the hearing and, if this is an issue, I need to get a memo to the decision maker for the hearing in the next day or so.

Can you please get back to me ASAP!

Cheers

Phil

## **ANNEXURE A – PRELIMINARY MATTER**

### **In the Matter of:**

Application CRC103935 by Wongan Hills Ltd under the Resource Management Act for resource consent to take and use groundwater from five bores for irrigation on the applicant's property located in Kaituna Valley.

**Minute of the Hearing Commissioner on a request for decision on a preliminary matter as set out in a Memorandum from Philip Burge, Consents Investigating Officer, dated 18 January 2011 (attached).**

### **Request**

Mr Burge has asked the Hearing Commissioner to consider whether another bore owner (P & N Hestor-Roe) in the Kaituna Valley should also be identified as a potentially affected party and given the opportunity to submit on the consent application (through the limited notification process of the Resource Management Act) or that the applicant be given the opportunity to amend the application or obtain the written approval of the other bore owner so that effects are less than minor, mitigated or not considered.

### **Applicant's Response**

The applicant has received the Officer's Memorandum and has informed the Commissioner (attached email) that he agrees with the suggested mitigation as set out in paragraph 9 of the Officer's Memorandum. This would, in the Officer's opinion, result in less than minor effects on one of the bores owned by P & N Hestor-Roe. The Officer notes that the other Hestor-Roe bore is unused.

### **Consideration**

I note that the decision on notification was to proceed down the limited notification path under the RMA, and that the parties identified as potentially affected be limited to the bore owners in the lower Valley; such owners being five people identified by the Investigating Officer and agreed by the applicant (and subsequently notified).

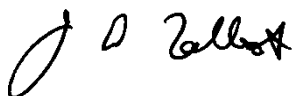
Potentially, P & N Hestor-Roe were in the same situation as the five notified parties and would have been notified if the application had remained as originally notified. However, with the reduction in abstraction rates (as agreed by the applicant) and the fact that one bore is unused, it is the Officer's opinion that the direct effects on the Hestor-Roe bores would be less than minor. While this would deal with the direct drawdown effects, it would not deal with the longer-term cumulative effects.

Further information was sought from the Officer and applicant via email (attached) as to whether the up-gradient location of the Hestor-Roe bores would provide a different outcome compared to the five notified parties whose bores are all down-gradient of the applicant's bores. Responses were received by email (attached).

The Officer's interpretation of the Commissioner's query is the correct one, and is answered in the Officer's email at paragraph 5. Of particular importance is the assessment that the amended application and proposed mitigation will not result in any adverse cumulative effects. While this is still to be tested at the Hearing, it is sufficient to enable the Commissioner to conclude that adverse effects on the Hestor-Roe bore of concern will be less than minor. If, during the Hearing, this situation changes, then there is ability to adjourn the Hearing while the application is either notified or the applicant obtains the written approval of the notified party or the application is further amended to reduce adverse effects to less than minor.

### **Directions**

1. The application is further amended as indicated in the Officer's Memorandum and email from the applicant.
2. The amended application with the mitigation proposed by the applicant, will, under RMA s95B, have less than minor adverse effects on P & N Hestor-Roe. Therefore, it is my decision that the application need not be limited notified to P & N Hestor-Roe.



John D Talbot  
Commissioner  
24 January 2011

Commissioner Talbot

I'll present my answers in the same order as Tony's earlier response answer your questions in order asked:

1. I concur with the applicant that the Hester-Roe bores are up gradient of all the Wongan Hills bores.

2. I further concur with the applicant that the other five bore owners notified are all down gradient of the Wongan Hills bores to be used for irrigation.

3. Mr Smith has confirmed that the aquifer test on M36/20408 did not show any direct drawdown effects, but considered that a Theis assessment was necessary to model direct "short term" (being seasonal) effects. While these were indicated by a Theis model, the applicant's adoption of weekly and seasonal volumes for this bore addresses the potential for direct drawdown effects over the irrigation season.

4. I agree with Dr Davoren that the Hester-Roe bore of concern is M36/5308 and that it is likely screened in the same alluvial aquifer as M36/3988 (Wongan Hills). As there is no change in abstraction from the applicant's shallow bores (M36/1344 and M36/3988), I consider that these shallow abstractions will not have an increased adverse effect. However this does not mean there will not be indirect long-term (i.e. beyond seasonal) cumulative effects resulting from the pumping from the volcanic aquifer via M36/20408, M36/20409 and M36/20411.

Having said that, however, and as discussed at the notification hearing, the trigger level mitigation proposed by the applicant and the provision of potable water to affected parties is agreed, in principle, to be sufficient to mitigate cumulative effects. My understanding was that this application was limited notified on the basis that the specific "trigger level" values proposed at the hearing were still to be fully audited and that the valley bore owners should be notified due to this uncertainty regarding the mitigation. I have subsequently audited these values and discussed them with Mr Smith and we are satisfied (as outlined in my Officer's report for the hearing) that the values are appropriate (if fixed to those in the further information presented by the applicant) although some clarification re when pumping will restart (if at all) and timeframes re the provision of potable water to those parties whose bores do have their reliability of supply adversely affected still need to be addressed by the applicant at the hearing.

5. With regard to whether the up-gradient location of the Hester-Roe's bores is relevant, I interpreted this last question differently to Dr Davoren and assume that it is related to the potential cumulative effects on the upgradient bores as a result of pumping from the volcanic aquifer. I have discussed this situation with Mr Matt Smith to determine if the up-gradient position is likely to reduce the potential for cumulative effects. Mr Smith has stated that he considers that being upgradient of the applicant's bores will afford them no additional protection over those bores in the lower valley, i.e. all bore owners are equally likely to be affected with regard to the potential cumulative effects. As stated above, however, there now appears to be agreement between the applicant, Mr Smith and myself that the values proposed for the trigger levels (if fixed) are sufficient to protect against cumulative adverse



effects. The remaining issues are points of clarification.

I hope this assists you in making your decision

Regards  
Philip Burge, PhD  
Consents Investigating Officer

-----Original Message-----

From: tony [mailto:tony@hydroservices.co.nz]  
Sent: Monday, 24 January 2011 9:50 a.m.  
To: 'John Talbot'; Philip Burge  
Cc: Alison Cooper; 'Brent Thomas'  
Subject: RE: Preliminary Matter for Commissioner's Consideration

John

To answer your questions in order asked:

1. Yes. The Hester-Roe bores re up gradient of all the Wongan Hills bores.
2. Yes. The other five bore owners notified are all down gradient of the Wongan Hills bores to be used for irrigation.
3. The aquifer test on M36/20408 did not show any direct drawdown effects on the Hester-Roe bores, and Matt Smith has confirmed this observation/conclusion.
4. The Hester-Roe bore of concern M36/5308 is likely screened in the same aquifer as M36/3988 (Wongan Hills), although the well log is significantly different to M36/3988 and 1344 (the closest shallow Wongan Hills bores) and M36/20408. There are no reports that previous abstraction from M36/3988 has affected this bore (or the shallow M36/4996).
5. Is the up-gradient location relevant? If there was abstraction from M36/5308 for other than domestic and stock water, it may be relevant for the assessment of effects. I would consider abstraction from Hester-Roe's M36/5308 for irrigation to be relevant for assessment of effects on the shallow Wongan Hills bores (M36/3988 and M36/1344).

Not sure if this answers your concern. If not please come back for any clarification.

Regards  
Tony Davoren

-----Original Message-----

From: John Talbot [mailto:john@johntalbot.co.nz]  
Sent: Friday, 21 January 2011 5:55 p.m.

To: Philip Burge; Tony Davoren  
Cc: Alison Cooper; Brent Thomas  
Subject: Preliminary Matter for Commissioner's Consideration

Thank you Tony and Phil

I have one critical question related to the Hestor-Roe bores. It appears to me that their bores are in the upper part of the Valley, i.e. up-gradient in

the groundwater sense of all the Wongan irrigation bores ?

The other five bore owners who were notified have all their bores in the lower Valley, i.e. down-gradient of some or all the Wongan bores ?

Can you both give me your comments on this, and whether you think it is relevant for the assessment of effects on the Hestor-Roe bores which must be

considered for the notification issue.

If you can respond on Monday, then I will provide my decision the same day. I am conscious of not wanting to delay the Hearing, but this is a critical issue for a potentially affected person.

Many thanks  
John T

John Talbot Sustainability Limited  
PO Box 102, Kaiapoi 7644  
Mobile 0274 322 767  
Landline 03 327 5303  
Fax 03 327 5308  
Email [john@johntalbot.co.nz](mailto:john@johntalbot.co.nz)  
Website [www.johntalbot.co.nz](http://www.johntalbot.co.nz)

----- Original Message -----

From: "Tony Davoren" <[tony@hydroservices.co.nz](mailto:tony@hydroservices.co.nz)>  
To: "Alison Cooper" <[alison.cooper@ecan.govt.nz](mailto:alison.cooper@ecan.govt.nz)>; <[John@johntalbot.co.nz](mailto:John@johntalbot.co.nz)>; "Philip Burge" <[philip.burge@ecan.govt.nz](mailto:philip.burge@ecan.govt.nz)>  
Cc: "Brent Thomas" <[brent.thomas@raewardfresh.co.nz](mailto:brent.thomas@raewardfresh.co.nz)>  
Sent: Friday, January 21, 2011 1:34 PM  
Subject: Re: Memo re Preliminary Matter for Commissioners Consideration

> John

>

> I have discussed Philip's memo with Brent. We can confirm the

> mitigation proposed in paragraph 9 of Philip's memo is accepted by the applicant.

>

> Thank you for the urgency to solve this oversight.  
>  
> Regards  
>  
> Dr Anthony Davoren  
>  
>  
> ----- Original Message -----  
> From: "Alison Cooper" <[alison.cooper@ecan.govt.nz](mailto:alison.cooper@ecan.govt.nz)>  
> To: <[tony@hydroservices.co.nz](mailto:tony@hydroservices.co.nz)>  
> Sent: Friday, January 21, 2011 9:01 AM  
> Subject: Memo re Preliminary Matter for Commissioners Consideration  
>  
>  
> <<CRC103935 - Memo re Preliminary Matter for Commissioners  
> Consideration.pdf>> Hello Tony  
>  
> As per the telephone conversation this morning with the Phil Burge,  
> Reporting Officer, please consider the attached memorandum re  
> 'Preliminary matter for Commissioners Consideration' and provide an  
> emailed response to Commissioner John Talbot,  
> ([john@johntalbot.co.nz](mailto:john@johntalbot.co.nz))and  
> cc: to me, before close of business today.  
>  
> Regards  
> Alison Cooper  
> Hearings Officer  
> [alison.cooper@ecan.govt.nz](mailto:alison.cooper@ecan.govt.nz)  
> DDI: 03 364 9830

## **ANNEXURE B – CONSENT CONDITIONS FOR CRC103935 TO TAKE AND USE GROUNDWATER**

1. Water may be taken only from:
  - a) Bore M36/20408, 300 millimetres diameter and 88.75 metres deep, at map reference NZMS 260 M36:85122-18478; and
  - b) Bore M36/20409, 300 millimetres diameter and 137 metres deep, at map reference NZMS 260 M36:83938-16024; and
  - c) Bore M36/20411, 300 millimetres diameter and 116.5 metres deep, at map reference NZMS 260 M36:83636-16576; and
  - d) Bore M36/1344, 200 millimetres diameter and 30.2 metres deep, at map reference NZMS 260 M36:84390-16565; and
  - e) Bore M36/3988, 200 millimetres diameter and 51.2 metres deep, at map reference NZMS 260 M36:84395-16562.
  
2. Water may be taken from:
  - a) Bore M36/20408 at a maximum rate of 16.5 litres per second and 1,426 cubic metres per day, and a maximum volume of 123,120 cubic metres between 1 July and the following 30 June; and
  - b) Bore M36/20409 at a maximum rate of 30 litres per second and 2,592 cubic metres per day; and
  - c) Bore M36/20411 at a maximum rate of 90 litres per second and 7,766 cubic metres per day; and
  - d) Bore M36/1344 at a maximum rate of 11.5 litres per second and 994 cubic metres per day; and
  - e) Bore M36/3988 at a maximum rate of 11.5 litres per second and 994 cubic metres per day; andwith a combined maximum rate of take from the five bores of 159.5 litres per second and a combined maximum volume of 1,107,975 cubic metres between 1 July and the following 30 June.

3. This consent CRC103935 shall not be exercised concurrently with either or both consents CRC940557 and CRC940558, and the combined volume of water taken in accordance with all three consents shall not exceed 1,107,975 cubic metres between 1 July and the following 30 June.
4. Water shall only be used for irrigation of crops and pasture for grazing stock, excluding milking dairy cows, on the area of land shown in attached plan CRC103935A which forms part of this consent.
5. The consent-holder shall, before the first exercise of this consent, surrender consent CRC101188 to the Canterbury Regional Council.
6. The consent-holder shall, before the first exercise of this consent, install an easily accessible straight pipe(s), 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.
7.
  - a) The consent-holder shall before the first exercise of this consent:
    - 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)(iii).
  - 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.
8. 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 manufacturer's 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 (7).

9. The Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager shall be informed immediately on first exercise of this consent by the consent-holder.
10. The taking of water in terms of this consent shall cease for a period of up to 48 hours, on notice from the Canterbury Regional Council, to allow measurement of natural groundwater levels.
11. The standing water level, relative to ground level and to the top of their casings, in bores M36/1421 (owned by MD & PE Young), M36/0727 (owned by Wongan Hills Ltd), and M36/1436 (owned by PK Menon) shall be measured and recorded by the consent-holder (where practicable to a precision of better than 0.01 metres) as follows:
  - a) Once at the start of the irrigation season before pumping has commenced; and
  - b) Once two days after the cessation of pumping at the end of the irrigation season; and
  - c) Once within the last three working days of each calendar month during the irrigation season; and
  - d) The standing water level measurements and the date and time 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 within five working days of the measurements being taken.
12. The consent-holder shall arrange for the conductivity of a sample of the groundwater in bores M36/1421, M36/0727, M36/1436, and M36/20409 to be analysed in milli Siemens per metre (mS/m) at a laboratory accredited to a NZS/ISO/IEC Guide 17025 or equivalent and defined by an accreditation body recognised as operating to ISO/IEC Guide 58 for that analysis as follows:
  - a) Once within the last three working days of July each year; and
  - b) Once within the last three working days of each calendar month during the irrigation season; and
  - c) The results of the conductivity analyses and the date and time of sampling shall be recorded in a log book kept for that purpose, and supplied to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager

within 10 working days of the results of the analyses being received by the consent-holder from the laboratory.

13. The taking of water in terms of this consent from bores M36/1344 and M36/3988 shall cease whenever the standing water level in:
- a) Bore M36/1421 has fallen below 1.4 metres above mean sea level (which is presently 1.68 metres below the top edge of the casing); or
  - b) Bore M36/0727 has fallen below 1.6 metres above mean sea level (which is presently 1.46 metres below the top edge of the casing); or
  - c) Bore M36/1436 has fallen below 2.5 metres above mean sea level (which is presently 0.71 metres below the top edge of the casing);

AND

- d) The conductivity of the groundwater in bores M36/1421, M36/0727 and M36/1436 is greater than 10 milli Siemens per metre (mS/m) above the conductivity reading taken during the preceding July.

Taking of water may recommence only when the conductivity of the groundwater in bores M36/1421, M36/0727 and M36/1436 is less than 10 milli Siemens per metre (mS/m) above the conductivity reading taken in the preceding July.

Notwithstanding (a) to (d) above, the taking of water in terms of this consent shall cease whenever the standing water level in any one of bores M36/1421, M36/0727 and M36/1436 is below 5 metres from the top edge of the casings of those bores.

14. The standing water level, relative to ground level and to the top of their casings, in bores M36/1344, M36/3988, M36/20408, M36/20409 and M36/20411 shall be measured and recorded by the consent-holder (where practicable to a precision of better than 0.01 metres) as follows:
- a) Once at the start of the irrigation season before pumping has commenced; and
  - b) Once two days after the cessation of pumping at the end of the irrigation season; and
  - c) Once within the last three working days of each calendar month during the irrigation season; and



- d) The consent-holder shall cease pumping for a period of at least 24 hours or until water level recovery is at least 95 percent complete prior to the standing water level measurement taking place; and
- e) The standing water level measurements and the date and time 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 within five working days of the measurements being taken.

15. The taking of water in terms of this consent from bores M36/20408, M36/20409 and M36/20411 shall cease whenever the standing water levels measured in accordance with condition (14) are below the “trigger” levels for either bore M36/1344 or bore M36/3988, and for any of bores M36/20408 or M36/20409 or M36/20411. For clarity, this means that the “trigger” level must be exceeded in at least one of the first two bores **and** in at least one of the latter three bores. The “trigger” levels are specified in the following Table:

<b>BORE</b>	<b>TRIGGER LEVEL (metres below ground level)</b>	<b>TRIGGER LEVEL (metres below top of casing)</b>
M36/1344	9.30	9.45
M36/3988	9.64	9.94
M36/20408	21.66	22.06
M36/20409	16.46	17.06
M36/20411	12.77	13.07

16. Whenever the taking of water has ceased in accordance with condition (15), the taking from any of bores M36/20408, M36/20409 and M36/20411 shall not resume until the standing water levels measured in accordance with condition (14) have recovered to at least the “recovery” levels in all the bores specified in the following Table:

<b>BORE</b>	<b>RECOVERY LEVEL (metres below ground level)</b>	<b>RECOVERY LEVEL (metres below top of casing)</b>
M36/1344	6.90	7.05
M36/3988	7.24	7.54
M36/20408	19.26	19.66
M36/20409	14.06	14.66
M36/20411	10.37	10.67

17. Whenever the taking of water has ceased in accordance with condition (15) and the water level falls below 5 metres from the top of the casing of bore M36/1421 (owned by MD & PE Young) or M36/1427 (owned by TL Clancy) or M36/1436 (owned by PK Menon) or M36/4050 (owned by PK Menon) or M36/3918 (owned by RM Hamblyn & S Kennedy) or M36/5308 (owned by P&N Hestor-Roe) or M36/1437 (owned by Christchurch City Council) then the consent-holder shall immediately supply water of potable standard to the affected bore owner at a daily rate at least at the bore-owner's usage at the time and a maximum daily rate of 10 cubic metres for as long as the bore water level is below 5 metres from the top of the casing.
18. The irrigation system used in association with taking water under this consent shall not be used to distribute effluent, fertiliser or any other added contaminant, unless a reduced pressure zone (RPZ) backflow preventer or an air gap backflow preventer is installed within the pump outlet plumbing to prevent the backflow of water into the bores in accordance with the following:
- a) The back flow prevention device must be designed and installed in accordance with the Canterbury Regional Council guide "Fertigation, Backflow Preventers" E05/30 (June 2009); and
  - b) The backflow preventer must be installed downstream of the water meter; and
  - c) The injection point for the effluent, fertiliser or added contaminant must be located downstream of the backflow preventer device; and
  - d) If a RPZ device is installed then it shall be tested within one month of its installation and every 12 months thereafter by a certified Approved Backflow Technician (ABT) or Independent Qualified Person (IQP) as defined in the CRC

guide E05/30, and a test report shall be provided to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, within one month of each test; and

- e) If an air gap device is installed then it shall be photographed. The photograph shall clearly show the air gap system. The photograph and a diagram showing the dimensions of the air gap and outlet pipe shall be provided to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, within two months of the installation of the device; and
- f) A copy of the most recent RPZ test report or air gap device information shall be located in the adjoining pumpshed and be readily accessible.

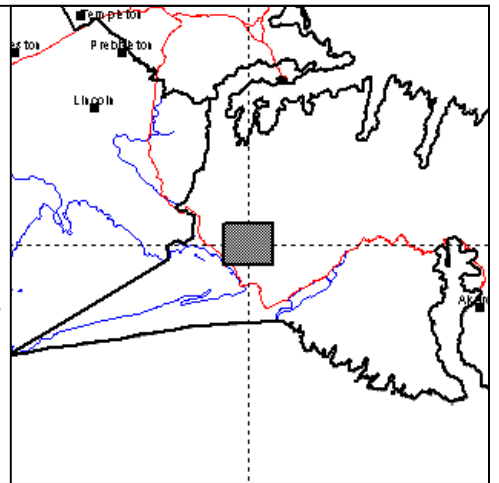
- 19. The consent-holder shall take all practicable steps to:
  - a) Ensure that the volume of water used for irrigation does not exceed that required for the soil to reach field capacity; and
  - b) Avoid leakage from pipes and structures; and
  - c) Avoid the use of water onto non-productive land such as impermeable surfaces and river or stream riparian strips.
- 20. The Canterbury Regional Council may, once per year, on any of the last five working days of May, serve notice of its intention to review the conditions of this consent for the purposes of dealing with any adverse effect on the environment which may arise from the exercise of the consent and which it is appropriate to deal with at a later stage.
- 21. The lapsing date for the purposes of section 125 shall be 31 March 2016.

**CRC103935A**  
**Wongan Hills Limited**

Produced by: Philip B  
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- STREAMS
- TLA BOUNDARIES
- ROADS
- Road centrelines from National Road Centreline Database (NRCD). The representation in a NRCD dataset of a road or track does not necessarily indicate a public right of way.
- Road Centreline

Irrigation of 280 ha within the shaded area

