BEFORE THE CANTERBURY REGIONAL COUNCIL

IN THE MATTER OF	the Resource Management Act 1991
AND	
IN THE MATTER OF	applications for resource consent by various applicants to take and use water from the upper Waitaki River catchment

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EVIDENCE OF FRANK SCARF ON BEHALF OF

CENTRAL SOUTH ISLAND FISH AND GAME COUNCIL

3 December 2009

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Qualifications and Experience

1. My full name is Frank Scarf and I reside in Timaru. I am a hydrologist and hold a New Zealand Certificate of Engineering (Civil) and a Bachelor of Science (Mathematics). I am now retired but continue to provide hydrological advice from time to time to Central South Island Fish and Game and Department of Conservation, particularly in relation to water resources assessment, modelling and management rules.

2. Throughout my working life spanning more than 45 years, I worked in hydrology, water resources management and related fields. During the 1990s, I was employed in various senior management positions within the Canterbury Regional Council including Southern Area Manager and Group Manager (Regulations and Consents). Throughout the 1980s, I filled the position of Water Resources Manager with the South Canterbury Regional Water Board.

3. I confirm that I have read and agree to comply with the Code of Conduct for Expert Witnesses (31 Mar 2005). This evidence is within my area of expertise except where I state that I am relying on what I have been told by another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express. Since 2000, I have run my own consulting business specialising in hydrology and water management.

4. This evidence is based on hydrological records provided by Environment Canterbury and on my personal knowledge of the Waitaki River and its water resources from living and working in the South Canterbury area for the past 30 years.

5. This evidence addresses the following in relation to the Upper Waitaki Irrigation Consents applications:
    a) general provisions
    b) individual applications.

6. In preparing this evidence, I have read and noted the S42A reports prepared by ECan officers and their Consultants, in addition to evidence presented by the applicants and others in relation to the applications.

7. I can confirm that I am conversant with the principal policy and planning documents surrounding these applications; in particular the Proposed Natural Regional Resources Plan, the National Water Conservation (Ahuriri River) Order and the Waitaki Catchment Water Allocation Plan (hereafter referred to as the Plan).

Low flow statistics agreement

8. I was requested by Fish and Game and Department of Conservation to act for them in determining the low flow statistics surrounding tributaries of the upper Waitaki subject to the suite of applications before you.

9. I can confirm that the table presented by Dave Stewart in his S42A report and attached here as Appendix 1 summarises the agreed position in those discussions.

General Provisions

Total allocation and review of existing consents

10. Because existing consents do not, in general, specify annual volumetric take, it could be interpreted that holders are entitled to exercise taking at their peak rate continuously. Take for example CRC952547 (Appendix 2) This consent entitles the holder to take up to 350 l/s from the Tekapo- Pukaki Canal for stockwater and borderdyke irrigation of 250 ha. On surface, this allows the holder is legally take upto11.03 Mm3/yr.

11. In saying this, I accept that where the consent identifies the purpose as being for irrigation, then the argument shifts to what is the irrigation season. Some farmers would suggest it extends from mid August to mid May. General consensus, however, is that the season goes from September to April. Accepting this, the taking of 350 l/s continuously equates to 7.32 Mm3/year.

12. Maria Bartlett in her S42A report (para 27) details the process used by the Council to assess annual allocation to existing irrigators in the absence of an annual volume being included as a condition of their consent. This is as follows:
    a) Spray irrigation is assumed to require 0.59 l/s/ha for 118 days/ year,
    b) Borderdyke irrigation is assumed to occur over 155 days and if the rate is consistent with the area irrigated, otherwise the allocation was taken as area times 1.5m water depth (i.e. 15 applications at 100 mm per application.

13. On this basis this consent would be allocated 1.504 Mm3/yr under a) and 3.75 Mm3/yr under b).

14. However in para 29 of her evidence, she reports that Mr Potts has since revised the assumptions surrounding b) above and for the Upper Waitaki allocation should now be calculated using 1.3m water depth. This reduces the allocation for this consent under b) above to 3.25 Mm3/yr.

15. With this adjustment to Consent CRC952547 and similar such borderdyke schemes, I note that the calculated consented allocation plus the allocation sought by new applicants (including renewals) now totals to 272.1 Mm3/yr and marginally less than the total allocation limit of 275 Mm3/yr specified in the Plan.

16. The point I make here is there is no legal certainty surrounding the level of existing allocation and with that no certainty with regard to the volume remaining to accommodate the applications before you. What is stated on existing consents is open to a legal interpretation which in summary could be markedly different to the position shown in Attachment 2 of Miss Bartlett evidence.

17. Until such time as all existing consents are reviewed to include an annual allocation as a condition of the consent, this uncertainty remains. It is disappointing that ECan saw fit not to review existing consents prior to these Hearings. The Plan is operative and s67 (7) and s128 (1) (b) of the RMA allows ECan to review consents to ensure compliance with 'maximum and minimum levels or flows or rates of use of water 'identified in the Plan. In my opinion, an annual allocation expressed in m3/yr is a rate of use, just the same as l/s or m3/d both describe rate of use.

18. Were these consents to be granted in the absence of a review, there is the risk that the Upper Waitaki becomes over allocated and the provisions in the Plan are ignored.

Common expiry date

19. Applicants to these hearings typically seek a 35-year term of consent from the date of application. A few applicants seek an expiry date of April 2025, consistent with Meridians Upper Waitaki suite of consents.

20. Issuing consents for a 35 year term, not withstanding their longevity, allows for applicants to secure conditions favourable to them based on conditions operating on existing consents. As a consequence, water management changes necessary to protect the instream environment, no matter how urgent, are difficult if not impossible, to implement. Staggered expiry dates based on a fixed term in my opinion runs counter productive to sound water management.

21. Instream interests are in general, not particularly interested in the application details and conditions attached to individual consents. Such groups are more interested in:
    a) the minimum flows and water management rules applying to the resource and each sector group,
    b) the total rates and volumes allocated to the individual abstractive sectors, and
    c) the policy and rules restricting the granting of consents outside those limits.

    In other words, they are more interested in the planning framework than in the relative merits or otherwise of individual consent applications.

22. Adopting a common expiry date of April 2025, consistent with that already applying to Meridians consents is to be recommended.

23. In saying this, it is recognised that RMA does not allow the Authority to change the expiry date once the consent has been issued. What is recommended here is that consents expiring between now and 2025 would, if renewed, be issued to expire in April 2025. This process would enable a review of the water management plan and its policy, sector block allocations and rules to occur in the interim with a view to any new Plan becoming operative before June 2024 and expiry of the Meridian consents.

24. Under such circumstance those seeking to renew consents at that time could apply *en bloc* under a common application (with individual listing) and AEE. This would in turn enable other interests to register objection, and if necessary be heard, at minimal cost in time and expense for all parties, including the Canterbury Regional Council. It would also help to consolidate the process and with that provide assurance that resource and sector allocation limits continue to be met and that common monitoring and minimum flow standards are maintained.

Minimum flow site and minimum flow conditions

25. The Water Allocation Board noted the issue surrounding granting of consents downstream from the minimum flow site and erosion of minimum flows throughout the lower river. In their decision they emphasised the need to maintain a minimum flow equivalent to a 1:5 year low flow (1:5 yr LF) or in the case of high natural character rivers, mean annual low flow (MALF), throughout the river system.

26. In the past there has been occasion where new consents downstream from the minimum flow site have continued to be granted (e.g. Maerewhenua, Pareora) with the same minimum flow condition as existing consents. This, by itself, generally does not impact the reliability of other farmers to exercise their consents. The practise does however add cumulatively to a reduced minimum flow regime throughout the lower reaches, even to the state where the river is dry more frequently and for longer duration than would have occurred naturally.

27. This issue is noted by Claire Penman in her S42A report. The wording of any minimum flow condition attached to your approval of an application requires detailed consideration in this regard.

28. If erosion of minimum flow is to be avoided, then each consent to divert and, or take should have a condition requiring that ' a flow of not less than "x" l/s; assessed by Environment Canterbury to be equivalent of a 1:5 yr LF for this site, shall be maintained immediately downstream from the intake site.' I acknowledge that this might require a great number of minimum flow sites and with that a significant monitoring effort to ensure compliance, and that this solution is administratively cumbersome except where there is only one or two takes on the tributary concerned.

29. Where the tributary contains a number of take sites, then ideally there would be two recording sites: one site upstream from all takes where the observed flow is used to impose restrictions necessary to preserve the minimum flow regime sought, and the second site downstream from all takes to monitor and record that the minimum flow condition is complied with.

30. Short of that, and with only an upstream site, the Council must necessarily resort to the solution described by Claire Penman in Box 1 (p22) of her report. The only problem with that solution occurs when a new applicant seeks to access water within the subject reach. Existing consent conditions cannot be altered simply to accommodate a new comer so forcing Council into the position of introducing a hierarchy of consents over that subject reach.

31. Not withstanding I am satisfied in the Upper Waitaki case that with the inclusion of these applications before you, the total allocation specified within the Plan is now exhausted. While not ruling out the possibility, I would like to think that any future applications to divert and take water consents would be limited in scope and expectation.

Water use recording and minimum flow site monitoring

32. Competition for water now requires continuous recording of water diversion /abstraction at the intake site to verify that rates and volumes granted through consent are being complied with. Those exercising consents should also be required to record flows retained instream at the minimum flow site. Where two or more consents are linked to a common minimum flow site then it is appropriate that the parties concerned meet the costs involved in servicing the site and submitting records to the Regional Council.

33. Site maintenance, and the reduction and submission of water use and residual flow data should ideally be carried out by an accredited service provider. I believe that the appropriate level of information should be to daily mean detail and that the data provided to ECan should be firstly forwarded to Meridian and secondly made available as public

use information. The frequency by which data is downloaded to ECan should be determined by ECan.

34. In the event of recording failure, I would expect the service provider and consent holder to take appropriate action to effect recovery as soon as possible including the manual recording of times of take and staff gauge readings so that any missing record can be filled in the an appropriate degree of accuracy.

35. Only by including the above requirements as conditions of each consent issued can there be any guarantee that consents to take water are being appropriately monitored for compliance.

Irrigation area

36. Allocation is assessed by Messrs Potts and Bartlett to be 118 days at 0.59 l/s/ha for spray irrigation and 1300 mm for border dyke irrigation. As already demonstrated previously in this evidence there are existing consent holders who fail to meet even these basic efficiency requirements.

37. While encouraging the border dyke irrigators to improve water use efficiency, it is important that this might be achieved within a realistic time frame so that water can be released from their consent to satisfy the needs of future applicants.

38. What I suspect will happen is that existing irrigators will simply continue with current practise and any improvements that are made will be transferred to an increased irrigation area through the non notified process. While not opposed to such transfer, the time to achieve efficient water use should be limited for borderdyke applicants irrespective of status (new or renewals), for example say 5 years from the date of granting the consent.

Individual applications

Mistake River

39. Lonestar Farms Ltd (CRC031175) seeks to take up to 290 l/s from Mistake River and to take 261 l/s for spray irrigation of 450 ha. The applicant company currently holds consents to divert 85 l/s and to take 72 l/s of that flow for irrigation. That consent expires in January 2036.

40. The Mistake River is located within the High Natural Character (HNC) area shown in the Plan and therefore any abstraction from the river is limited by Rule 2 Table 3 (i) to 10% of the MALF.

41. The 7d MALF at the proposed intake site is assessed to be 520 l/s (Appendix 1) setting an allocation limit of 52 l/s. The existing consent already exceeds this limit and adding this application would bring total diversion up to 375 l/s and seriously at variance with the provisions within the Plan. Clearly the Water Allocation Board sought to protect what it identified as being High Natural Character waters (Policy 2) through implementation of Policies 29-34 and Rules 2 and 10.

42. If consent is granted it should include a minimum flow of 520 l/s and in addition I recommend a 1:1 sharing above the minimum flow. Taking into account that existing consents for 85 l/s and its minimum flow of 350 l/s, this means that only when the flow exceeds 605 l/s could the diversion commence and only when the flow exceeded 1185 could the full 290 l/s diversion be diverted. This would impact flow variability beyond what I would consider to be minor, and in that context would be at variance with Policy 32.

Station Stream

43. Lilybank Station Holdings Ltd (CRC071786) has applied to divert upto 100 l/s from Station Stream for spray irrigation of 172 ha.

44. Station Stream is within the HNC area and is assessed to have a MALF at the proposed intake site of 320 l/s (Appendix 1). Under the 10% rule applying to HNC catchments, consented abstraction is limited to 32 l/s making this application at variance with the provisions of the Plan.

45. This is similar to the Lonestar application above. If consent is granted it should include a minimum flow condition requiring 320 l/s to be retained instream downstream from the intake and a 1:1 sharing above the minimum. This means that only when flows exceeded 520 l/s could the consent be fully exercised and at this point 400 l/s would be retained instream.

Cass River

46. Glenmore Station Ltd previously held consent to take upto 230 l/s and 1.26 Mm3/yr from the Cass River. The application before you (CRC052501) is essentially a replacement of that authorisation but with an increased irrigation area; 180 ha as opposed to 105 ha previously. There are no other consents, current or applied for, relating to this resource.

47. The Cass River is also included within the HNC area and at the proposed intake site is assessed to have a MALF of 4550 l/s. The proposed abstraction rate of 230 l/s is well within the 10% MALF limit and therefore the application can be regarded as complying with Rule 2, Table 3 (i).

48. I note that in Attachment 2 (S42A Report), an annual volume of 810,000 m3/yr is allocated to this application as opposed to the 1,260,000 m3/yr applied for. The application seeks leave to continue with existing inefficient borderdyke irrigation systems for not more than 5 years from date of issue of consent during which time the borderdyke system will be replaced by spray irrigation. I understand that Meridian has provided derogation approval for 1,200,000 m3/yr.

49. I recommend that consideration be given to granting this application subject to inclusion of the following conditions:

    a) a minimum flow condition requiring not less than 4550 l/s is retained instream below the intake site and a 1:1 sharing regime above the minimum flow
    b) a condition restricting annual divert to 230 l/s and 1,200,000 m3/yr for a period of 5 years from the date of approval of this consent, and

c) a condition restricting annual divert to 230 l/s and 810,000 m3/yr commencing 5years following the date of approval of this consent through to expiry.

Irishmans Creek

50. Irishmans Creek Station Ltd (CRC084263) has applied for consent to take up to 140 l/s and 993,600 m3/yr from Irishmans Creek for spray irrigation of 48 ha. This is an application to replace an existing consent. Additionally Irishmans Creek Station Ltd is looking to divert up to 500 l/s for micro hydro generation.

51. At Windy Ridge, some 2km downstream from the subject property, Irishmans Creek has a mean flow of 1660 l/s and a MALF of about 470 l/s. A 1:5 yr LF is assessed to be in the order of 320 l/s.

52. The minimum flow provisions for consents to this resource are included under Rule 2 Table 3 (iv) of the Plan as follows:
    a) A minimum flow of 0.3 cubic metres per second at SH8 (i.e Windy Ridge)
    b) An allocation limit of 0.3 cubic metres per second.

53. I note that in Attachment 2 (S42A Report), an annual volume of 720,000 m3/yr is allocated to this application as opposed to the 993,600 m3/yr applied for. The applicant has since indicated acceptance of the lesser volume.

54. Setting aside the micro hydro generation consent, the application is complying and I would recommend granting the application subject to inclusion of the following conditions:
    a) a minimum flow condition requiring not less than 300 l/s to be retained instream below the intake site. (Windy Ridge is acceptable in this instance)
    b) that divert /take is restricted to 140 l/s and 720,000 m3/yr.

55. The micro hydro application however poses significant impact with regard to fish passage. This is addressed in detail in Mr Webb's evidence. I have to say that from a hydrological viewpoint, the diversion of 500 l/s will significantly alter the low flow duration distribution throughout that length of streambed affected by the diversion.

Grays River

55. A. N. Hope has lodged two applications: application CRC041542 seeks to take up to 166 l/s and 1,642,200 m3/yr from the Grays River for spray irrigation of 238 ha, while CRC041543 is to take 84 l/s and 1,014,300 m3/yr from Snow River, a tributary of the Grays, for spray irrigation of 147 ha.

56. Grays Hills Station Ltd (CRC042661) has also applied to take upto 100 l/s and 2,304,000 m3/yr from the Grays River for spray irrigation of 384 ha.

57. There are two existing consents on the Grays River system. These are issued to (i) R W Allan (CRC012000) to take 170 l/s from Edward Stream, and (ii) to Glenrock Station Ltd (CRC012022.1) to take up to 140 l/s from Sawdon Stream.

58. Total take from the Grays River and tributaries is limited by the provisions within Rule 2 Table 3 (v) of the Plan. This is as follows:

a) a minimum flow of 1.8 m3/s in the Grays River at Days Bridge
b) an allocation limit from the Sawdon of 0.25 m3/s
c) an allocation limit from Edward Stream of 0.25 m3/s
d) an allocation limit from the remainder of the Grays catchment of 0.5 m3/s
e) no flow sharing regime.

59. I note that Attachment 2 lists the annual volumes for these applications and existing consents as follows:
a) Application CRC041542; 1,642,200 m3/yr; the same as applied for
b) Application CRC041543; 882,000 m3/yr compared to1,014,300 m3/yr applied for
c) Application CRC042661; 1,140,000 m3/yr compared to 2,304,000 m3/yr applied for.

60. In terms of rate of take, the individual and sum total of abstraction, (current and proposed) complies with the provisions of the Plan. The total take proposed for the remainder of the Grays (excluding takes from the Sawdon and Edward) is 350 l/s and well within the 500 l/s provided for.

61. The only issue surrounding the Grays River is that relating to the minimum flow. Following detailed analysis of concurrent gauging data (Dave Stewart S42A report, Part 2 130-150) there is consensus among hydrologists acting for various parties that the 1:5 yr LF for the Grays at Days Bridge is about 1500 l/s and less than the 1800 l/s referred to in Rule 2 Table 3 (v).

62. I note that the Grays River is not referred to specifically in Annex 1 attached to the Plan. However, I also note the background as described by Stewart in para 138 of his s42A report and I am satisfied that if the Board intended that a 1:5 yr LF equivalent is appropriate for the Grays then 1500 l/s is the best estimate at this time.

63. The applicants in this case seek the lower minimum flow level and in doing so, they make the applications non complying. It is then a question of whether you consider potential environmental effects to be less than minor.

64 I am of the opinion that parties seeking to change any of the minimum flow and allocation provisions established by the Plan should do so through a Plan change as opposed to the consents process. In the event that a Plan change is sought, I would support an application to reduce the minimum flow from 1800 l/s to 1500 l/s on the basis that the Board intended a 1:5 yr LF should be preserved. However until that occurs, any approval of these three applications should, in my opinion, include a minimum flow condition requiring a flow of not less than 1800 l/s is retained instream at Days Bridge.

65. Provided that:
a) the annual volumes are limited to the volumes detailed in Attachment 2 (S42A Report) as opposed to what was applied for
b) and that the 1800 l/s minimum flow is preserved pending any Plan change application and approval,
then I would support these applications.

Stony River

66. Haldon Station Ltd (CRC082269) has applied to divert up to 320 l/s and 4,000,000 m3/yr from the Stony River for stockwater and irrigation (280 l/s and 3,163,000 m3/yr) of 470 ha. This is essentially a 'replacement with increase' application.

67. There are no other consents, issued or applied for, to take from this resource. I note that Attachment 2 (S42A Report) assigns 4,000,000m3/yr to the application.

68. The proposed minimum flow site is located at Hinch Bend. The hydrology and reasons for selecting this site are described by Stewart in his s42A report (para 206-223). It is accepted that Stony River goes dry downstream from the intake site at the outlet from the gorge. Flow re-emerges some distance downstream towards Hinch Bend and from there to the outlet into Lake Benmore, the river is spring-like with lesser flow variability than that which occurs in the upper section of river. This more regular and constant flow pattern makes for a valued and reliable trout spawning environment.

69. I support the adoption of Hinch Bend as the minimum flow site.

70. Stony River is not mentioned specifically within Rule 2 Table 3 and therefore defaults to (xxii) of the Table and 'All other rivers and streams'.

71. The hydrology surrounding natural flows occurring at Hinch Bend is described in evidence presented by Richard de Joux appearing for the applicant, and Dave Stewart in the s42A report. I have viewed that evidence together with other supporting documentation and agree that the 1:5 yr LF at this site is about 200 l/s.

72. I consider the application to be complying and could be granted subject to inclusion of the following conditions (among others):
    a) a minimum flow condition requiring not less than 200 l/s to be retained instream at Hinch Bend (I39:909451) and that
    b) divert is restricted to 320 l/s and 4,000,000 m3/yr and take for irrigation is limited to a maximum rate of 280 l/s and 3,163,100 m3/yr.

Sutton Stream

73. Mr F Graham (CRC072363) has applied for consent to take upto 12 l/s and 150,000 m3/yr from Black Jack Stream for spray irrigation of 45 ha. Mr Graham already holds consent to take upto 17.5 l/s from neighbouring Miller Stream to irrigate 45 ha. In the s42A report, Ms Vesey notes that the irrigated area appears to be about 80 ha and presumably the two consents will between them service that total area. Black Jack and Miller streams are tributaries of Gibson Stream which in turn flows into Sutton Stream and eventually Lake Aviemore.

74. The proposed minimum flow site is downstream from the Graham intakes and located on Sutton Stream at map reference I39:967215. Similar to the Stony River, Sutton Stream also defaults to s xxii and 'All other rivers and streams'. The 1:5 yr LF and mean flow for this site are assessed to be 80 l/s and 280 l/s respectively.

75. Waitangi Station (CRC030944) is also applying for consents to take from these streams as follows:

a) To take upto 55 l/s and 330,000 m3/yr from Sutton Stream and to use up to 40 l/s for irrigation of 55 ha.
b) To take upto 55 l/s and 300,000 m3/yr from Gibson Stream and to use up to 40 l/s for irrigation of 23 ha.
c) To take up to 30 l/s and 300,000 m3/yr from Lake Aviemore and to use 30 l/s for irrigation of 50 ha.

76. The intake sites on Sutton and Gibson streams are located upstream from the proposed minimum flow site.

77. Adding all existing proposed takes brings the total abstraction from Suttons Stream to about 140 l/s.

78. With the minimum flow downstream from all abstraction sites, I see no requirement at this point to introduce any sharing regime. This could change if other applications to take from this source were to be lodged in future.

79. I have read and agree with the conditions recommended in Ms Vesey's S42A report including the volumetric limits placed on the applications concerned.

Coal Creek and Shepherds Creek

80. Mrs Falconer et al (CRC060253) have applied for replacement consents to take up to 14 l/s from Coal Creek and 14 l/s from Shepherds Creek at a combined volumetric rate of 356,000 m3/yr for irrigation of 80 ha. Both streams flow into the Haldon Arm of Lake Benmore. There are no other consents to take water from these catchments.

81. In terms of Rule 2 Table 3, this application too defaults to the 'All other rivers and streams' category. On Coal Creek the proposed monitoring site is at the intake while on Shepherds Creek the monitoring site is downstream from the intake site. 1:5 yrLF estimates for the two streams are 29 and 60 l/s, respectively.

82. Attachment 2 (S42A Report) allocates this application 356,000 m3/yr which is as applied for.

83. Subject to inclusion of a minimum flow condition requiring the grantee to cease taking water when flows immediately downstream of the intake reduces below 29 l/s on Coal Creek and 60 l/s on Shepherds Creek, then granting the applications is supported.

84. There is one other matter in relation to these applications. Policy 8 of the Plan directs Council to consider alternative sources of water where applications seek to access water from streams having a MALF less than 100 l/s. This applies in this case. Taking into account the location and elevation of the irrigation areas and the likely costs of pumping water up from Lake Benmore, the closest major source, I am satisfied that the Lake Benmore solution is not a viable alternative. The same conclusion is made in regard to takes from Scrubby and Camp creeks to follow.

Scrubby Creek and Camp Creek

84. Totara Farming Company has applied for consents to divert up to 50 l/s from Scrubby Creek to Coal creek continuously and during the irrigation the Company will take up to 19 l/s and 75,000 m3/yr from a pond located on the diversion race for spray irrigation of 34 ha. Previous consents held in respect of these activities expired in June 2001 and the current applications were not lodged until later that year.

85. This too defaults to the 'All other rivers and streams' category. The 1:5 yr LF at the proposed minimum flow site located on Scrubby Creek is assessed to be 30 l/s.

86. The minimum flow site is reportedly upstream from the diversion site.

87. As with the nearby Coal and Shepherds creeks consents I support the application provided a condition is included to the effect that a residual flow of not less than 30 l/s shall be maintained in Scrubby Creek immediately downstream from the diversion intake.

Ahuriri River

88. The Ahuriri River can be essentially divided into five sections as follows:
    a) East Ahuriri
    b) Mainstem Ahuriri River
    c) Hen Burn
    d) Quail Burn
    e) Omarama Stream

89. The National Water Conservation (Ahuriri River) Order 1990 details the rate by which water may be abstracted from its protected waters. This protection extends from Lake Benmore along the Ahuriri River mainstem to its headwaters. Clause 3 of the Order states that Ahuriri River and its tributaries include and provide for outstanding wildlife habitat, fisheries and angling. The 'east branch' is specifically excluded from the 'Protected Waters' definition. In saying this, the words 'east branch' are not defined within the Order.

90. Clause 4 of the Order states that ' Because of the outstanding features specified in clause 3, the quantity and level of natural water in all lakes, ponds, tarns, lagoons, and streams (other than Omarama Stream) forming part of the protected waters shall be retained in their natural state.' Clause 5 then goes on to detail the extent to which water may be taken from the Ahuriri River. No mention is made of the East Ahuriri. The only exception mentioned is subsection (7) which states 'nothing in this clause (i.e. Clause 5) shall be construed as preventing the reduction of flow in the Quail Burn or its tributaries.'

91. The 'protected waters' for Omarama Stream are defined as extending from Clifton Downs to the confluence with the Ahuriri River. Abstraction of water from Omarama Stream is regulated by Clause 6.

92. Clause 8 (1) states that 'a water right shall not be granted under section 21 of the (Water and Soil Conservation) Act ...in respect of -

a) .....

b) Any river or stream forming part of the protected waters if the effect of the grant or authorisation would be to prejudice the maintenance of the rates of flow specified in clauses 5 (relating to the Ahuriri River) and 6 (pertaining to Omarama Stream) of this Order'.

93. The following partitions the applications before you into the afore mentioned categories:

a) East Ahuriri	CRC042020 M Horo
b) Ahuriri Mainstem	CRC041331 Killermont Station Ltd
	CRC041777 Killermont Station Ltd
	CRC041788 Southdown Holdings Ltd
	CRC073115 Southdown Holdings Ltd
c) Hen Burn	CRC071649 Bellfield Land Company
d) Quail Burn	CRC991473 D W McAughtrie et al
	CRC011987 Bellfield Land Company
	CRC042011 M Horo
	CRC042015 M Horo
	CRC042017 M Horo
e) Omarama Stream	CRC041798 Killermont Station Ltd
	CRC063564 Killermont Station Ltd
	CRC040180 Killermont Station Ltd
	CRC011361 Dunstan Peaks Ltd (6 separate diverts).

East Ahuriri River

94. Any consent issued to take water from the East Branch Ahuriri River has potential to impact on the provisions of Clause 4 of the Conservation Order. Clearly Clause 5 allows for some abstraction to occur. However, the Order fails to make clear whether any consent issued to take water from the East Branch are to be included within the total abstractive allocation limits for the Ahuriri River as set out in Clause 5.

95. M Horo has applied to take up to divert up to 570 l/s from the East Ahuriri River and to take up to 250 l/s and 2,100,000 m3/yr for irrigation of 350 ha. I understand this has since been amended to take 174 l/s and 1,800,000 m3/yr. There are no other existing consents or applications to take water from this river.

96. The applicant submits that their application is exempt from the provisions of the Conservation Order and therefore automatically defaults to the 'All other rivers and streams' category of the Plan. I remain somewhat uneasy about this assumption.

97. I note that the previous consent expired in October 2001 and this application was not lodged until some 18 months after that expiry date which in effect relegates the application to the new applications category as opposed to renewal of existing consents.

98. Should you accept the applicant's contention that the application falls into the 'All other rivers and streams' category and decide to grant consent then in my opinion the appropriate minimum flow should be 400 l/s at G39:483355 immediately downstream from Ribbonwood Creek. This is assessed to be the 1:5 yr LF for this site.

Ahuriri Mainstem

99. In her s42A report, Ms Penman provides detailed examination of Clause 5 and the limits allowable for abstraction from the mainstem Ahuriri. Essentially the Conservation Order limits abstraction to 2 m3/s in total when flows recorded at South Diadem Gorge are within the range 15 – 25 m3/s. When flows exceed 25 m3/s up to 3 m3/s may be consented.

100. Between 1 May and 31 Jan the minimum flow regime from South Diadem to SH8 is limited to 0.6 m3/s less than the Gorge flow when flows at the Gorge are in the range 12 – 15 m3/s. For the section from SH8 to Lake Benmore, the minimum flow regime is limited to 1.2 m3/s less than the Gorge flow.

101. Between 1 February and 30 April the same margins apply but the low flow range is 10 – 15 m3/s instead of 12 – 15 m3/s.

102. Notwithstanding the above, Clause 5(6) of the Order makes it lawful for the flow in the Ahuriri River to be reduced by a further 0.5 m3/s for the purposes of augmenting flows in Omarama Stream for maintenance of wildlife and fisheries values.

103. I have reviewed Ms Penman's s42A analysis and largely agree with her findings. Band 1, that is, the 0.6 m3/s between Gorge and SH8 when flows are less than 15 m3/s, is already taken up by Omarama Station (CRC011354.1). The total of consents currently on issue, not including any diversion from the Ahuriri to Omarama Stream for fisheries maintenance, is about 1.98 m3/s. Therefore Band 2 allowing for up to 2.0 m3/s to be abstracted when flows at the Gorge are within the range 15 - 25 m3/s is also exhausted.

104. This leaves only 1 m3/s to be allocated and exercisable only when flows exceed 25 m3/s.

105. Current applications before you include:

a) CRC041331 Killermont Station Ltd	100 l/s 1,209,000 m3/yr
b) CRC041777 Killermont Station Ltd	175 l/s 1,680,000 m3/yr
c) CRC073115 Southdown Holdings	950 l/s 6,600,000 m3/yr

The divert and take proposed for these three applications totals 1.225 m3/s which together with the 1.98 m3/s brings the total for the Ahuriri mainstem to about 3.2 m3/s and in excess of the 3.0 m3/s provided for in the Conservation Order.

106. I understand that application CRC041788 is to be withdrawn in favour of an alternative proposal. If that is not the case then this would increase the total divert /take to 4.15 m3/s.

107. Either all three applications should be reduced to conform with the limits set out in the Order, or alternatively one or more of the applications will need to be declined on the grounds that to grant the consent(s) would breach the provisions of Section 8(1)(b) of the Water Conservation Order.

Hen Burn

108. There are two consents currently issued to take from the Henburn. CRC020508 authorises Messrs W H and A J Sutherland to take of up to 50 l/s from Horse Gully, a tributary of the Hen Burn. This consent requires the holder to maintain a residual flow of 20 l/s immediately downstream of the intake. At that site, the catchment area is about 6.7 sq km. Gabities and Horrell estimate MALF for the site to be about 57 l/s which would put the 1:5 yrLF at about 35 l/s.

109. I note that the application lodged by Bellfield Land Company is a replacement application. The current consent (CRC001096.1) authorises the diversion of 60 l/s and the taking of 30 l/s for spray irrigation of 7 ha. Conditions attached to the consent link exercise of the consent to the minimum flow conditions of the Ahuriri Water Conservation Order. The replacement application seeks to take 30 l/s and 312,000 m3/yr for spray irrigation of 52 ha.

110. There are two sites proposed for this application, the first being on the eastern branch of the Hen Burn (and includes Horse Gully) and the other being on the Hen Burn proper.

111. The primary concern I have relates to the minimum flow condition sought. The Bellfield Land Company (CRC071649) includes an abstraction site on the same source and downstream from the Sutherland Bros consent, and should in our opinion be subject to at least the same minimum flow condition, that is 20 l/s to continue downstream from intake.

112. The Hen Burn is not specifically excluded from the WCO provisions. The Plan (Rule 2 Table 3 (xii)) makes provision for the Hen Burn and tributaries and limits allocation to 80 l/s and a minimum flow at Hen Burn Road of 20 l/s. The location of the Hen Burn Road site is not defined but presumably it refers to the location H39:644335. I consider the minimum flow provision of 20 l/s to be minimal. In order to preserve some flow throughout the catchment, I recommend that 20 l/s should be retained immediately downstream from any approved intake site irrespective of location within the catchment. This would be consistent with the Sutherland Bros consent and would afford some guarantee that 20 l/s would be preserved throughout the lower reaches of the stream.

113. Finally, Gabities and Horrell estimate that the MALF for the Hen Burn road site is about 85 l/s, which in turn suggests that the 1:5 yr LF for this site is about 60 l/s. From this, the minimum flow prescribed in the Plan appears inadequate and should attract further consideration in the event of a Plan review.

Quail Burn

114. Rule 2 Table 3 (xi) of the Plan limits allocation to 310 l/s and requires a minimum flow of not less than 100 l/s to be retained instream at the Hen Burn Road (H39:655355) . A flow sharing regime is to be introduced when flows at Hen Burn Road exceed 1000 l/s.

115. McAughtrie et al and Bellfield Land Company seek replacement consents for their existing authorisations, CRC991473 and CRC011987, respectively. The former has applied to divert up to 170 l/s into what is referred to as the Quail Burn Government Race while the latter seeks to take to divert and take 140 l/s immediately downstream from the Government Race intake for spray irrigation of 208 ha. Between them, these two applicants have exhausted the allocation of 310 l/s available from the Quail Burn.

116. Any approval for new applications (CRC042011, CRC042015, CRC042017and CRC 042018 each taking 30 l/s) would necessarily default to 'B' permits with a 1000 l/s minimum flow and a sharing regime. I recommend a 1:1 sharing regime in this instance. Between them, these consents total 120 l/s, not withstanding the applicant's claim that they propose to take only 90 l/s at any one time.

117. With this, the water management regime (in l/s) would be:

Observed flow	Retained instream	"B" take
1000	1000	0
1120	1060	60 (two pumps)
1240	1120	120 (four pumps)

118. Gabities and Horrell estimate that MALF for the Quail Burn immediately upstream from the Government Race intake is about 330 l/s. This in turn, suggests that the 1:5 yr LF is about 220 l/s. From this, I conclude that the 100 l/s minimum flow identified in the Plan is inadequate and this too is something that may need to be addressed in the event of a Plan review.

Omarama Stream

119. The Omarama Stream is already heavily committed for abstractive use. Ms Penman in her s42A report (Attachment 6) has reviewed the existing consents and concluded that 1076 l/s is currently authorised for that use. Of this, she estimates 660 l/s is taken between Twin Peak Bridge and Tara Hills (upper section) with the remainder being taken between Tara Hills and the confluence with the Ahuriri River.

120. Within the upper section the principal user is Tara Hills Station which takes upto 570 l/s. During the irrigation season up to 500 l/s is diverted from the Ahuriri River and discharged into the Omarama Stream at the Tara Hills Station intake. This is necessary to enable Tara Hills to exercise its consent and still comply with the 500 l/s (1 Nov-30 Apr) and 1200 l/s (1 May- 31 Oct) minimum flow requirements at Omarama Station Bridge specified in the Water Conservation Order.

121. There are a number of new applications before you, all of which seek to take or divert water upstream from Twin Peak Bridge, the upper most control site in terms of the WCO and about 2km downstream from the 'Protected Waters' boundary at Clifton Downs.

122. The applications are outside the WCO boundary and similar to the East Ahuriri situation could be assumed to default to the 'All other rivers and streams category'. Gabities and Horrell have assessed the MALF for the Twin Peak Bridge site to be 546 l/s which suggests that the 1:5 yr LF for this site is about 375 l/s. Down at Tara Hills, de Joux and Stewart estimate the 1:5 yr LF to be 470 l/s. The two figures appear compatible given that Manuka Creek makes a contribution (mainly subsurface) between the two sites. I am of the opinion these estimates are reasonably sound.

123. Supporting evidence presented by the applicants allude to losses and gains in surface water flow that they claim occur naturally throughout the upper catchment tributaries. I have not assessed that in detail. Instead, I have tried to look at these applications upstream from Twin Peak Bridge as a group. The Dunstan Peak applications are complex and involve many diversions and takes for both stockwater and irrigation. The Killermont Station applications are more straightforward.

124. For the Dunstan Peaks applications, I recommend that any approval should simply include a condition requiring the applicant to cease taking water for irrigation when the flow at Twin Peak Bridge is less than 375 l/s, assessed to be 1:5 yr LF for this site. However, I consider that diversion of the stockwater portion (up to a maximum of say 15 l/s) from tributary to tributary and in to storage at the rate specified by consent should be exempt from that minimum flow restriction.

125. For the Killermont Station applications and the taking of water from Manuka Creek, I support the water management regime suggested in Ms Rodrigo's s42A report (CRC 041798) where she proposes a minimum flow of 65 l/s at H39:541225 and a sharing of flows between Twin Peaks Station and Killermont. However the point H39:541225 is upstream from both of the proposed take sites and in order to retain a the 1:5 yr LF I recommend that the minimum of 65 l/s be retained downstream from the lowermost take site (Killermont) at H39:560237.

126. As for the Frosty Gully application (CRC040180), I believe that this is best linked to the Manuka Creek site and that the taking of water for irrigation purposes should cease when flows at the upper site (H39:541225) reduces below 65 l/s.

Otamatapaio River

127. There are four applications to take from the Otamatapaio River. These are:

a) CRC012047 Otamatapaio Station Ltd to divert 200 l/s from the Otamatapiao River and to take 140 l/s and 2,442,840 m3/yr for irrigation of 200 ha.

b) CRC012017 K J Anderson Family to divert and take 110 l/s and 1,749,656 m3/yr from Corbies Stream at map reference H40:787178 for irrigation of 105 ha.

c) CRC012019 K J Anderson Family to divert and take up to 110 l/s and 1,188,806 m3/yr from Corbies Stream at map reference H40:786213 for irrigation of 105 ha.

d) CRC041033 Otematata Station Ltd to divert up to 400 l/s from Glen Bouie Stream and to discharge that water into Backyard Stream for subsequent diversion into storage located some 2km downstream. Water is to be taken from storage at a rate of 75 l/s for irrigation of 120 ha.

128. The Otamatapaio Station and Anderson applications are, by and large, renewals of Notified Use consents that expired in October 2001. These applications were lodged prior to expiry date and exercise has continued under s 124 authority since that time.

129. The Otematata Station Ltd application, I consider, is a new application. Previous consents to take and divert stockwater at the subject site expired in December 1990 and this application was not lodged until November 2003.

130. Otamatapaio Stream is not separately identified within Rule 2 Table 3 and therefore defaults to the 'All other rivers and streams' category. Hydrologists acting for the various parties agree that the minimum flow site should be on the Otamatapaio River at Footbridge (H40:759168). The 1:5 yr LF estimate for this site is 200 l/s. Mean flow is assessed to be 1120 l/s.

131. The proposed minimum flow site is located immediately upstream from the Otamatapaio Station intake. In her s42A report Ms Penman proposes that all takes from the Otamatapaio River including those from Corbies and Glen Bouie streams should be subject to the following water management restrictions.

a) When the flow is in the Otamatapaio River at Footbridge is greater than 600 l/s then water may be taken at the maximum rate specified on the consent.

b) When the flow is less than 600 l/s at the Footbridge but greater than 200 l/s then the rate of divert/take shall be reduced according to the following formula.
% of take rate allowed= (Observed flow-200)/400

c) When the flow recedes to less than 200 l/s at Footbridge all taking of water for irrigation purposes shall cease and flow in all diversion races shall be restricted to that required solely for stockwater purposes.

132. I support this management regime for these four applications. Under the above condition, all consents would be reduced to half their consented take when flow at the Footbridge fell below 400 l/s. Concurrent gaugings work carried out by Fish and Game indicates that between the Corbies confluence and SH 83 there is a loss of about 200 l/s. The minimum flow regime proposed will ensure that some flow in this section is retained for much of the time so enabling fish passage from Lake Benmore to the upper reaches of both Corbies Stream and the Otamatapaio.

Twizel River

133. Rule 2 Table 3 partitions the Twizel River into two sections as follows:

a) Upstream from State Highway 8 there is a minimum flow of 1.0 m3/s at SH8 and a flow sharing threshold of 2.8 m3/s.

b) Downstream from SH8 there is a minimum flow of 0.8 m3/s immediately upstream from the confluence with the Ohau River and a flow sharing threshold of 2.6 m3/s.

134. Ms Penman has reviewed all the divert/take consents to this resource. Authorised abstraction upstream from SH8 currently totals about 800 l/s, while about 80 l/s is taken downstream from that point. The latter does not include a deep (130m) groundwater take issued to Rosehip Orchards.

135. There is only one new application. This is from Rosehip Orchards Ltd to take up to 194 l/s downstream from SH8 bringing the total for the lower each to about 275 l/s.

136. Existing and applied for consents are well within the levels permitted without requirement for flow sharing. Subject to the minimum flow of 800 l/s as measured above the confluence with the Ohau River, I would suggest 'immediately downstream from the point of take at H38:946516', being a condition of consent, the application by Rosehip Orchards can be supported.

137. Finally with regard to the Twizel, I note that MALF at SH8 and the Ohau confluence are estimated by Gabities and Horrell as being 1750 and 1510 l/s, respectively. This in turn puts the 1:5 yr LF for these two sites at about 1225 and 1060 l/s, respectively and about 200 l/s higher than their existing minimum flow provisions. This is also a matter that might be addressed in the event of a Plan review.

Wairepo Stream

138. The Wairepo situation is far from clear and in my opinion requires detailed examination to establish clearly the natural hydrology and the distribution and allocation of the resources within this catchment. Reading the comments attached to Table 3(viii) (c) of Ms Penman s42A report Attachment 6 only serves to reinforce my contention that such a study is necessary.

139. I note that the catchment area above the Wairepo Arm outlet is about 190 km2. Based on isohydal mapping, I assess the natural 1:5 yr LF for this site should be about 110 l/s. This is considerably higher than the 30 l/s minimum flow provided for within the Plan.

140. Much of my misunderstanding about the Wairepo surrounds the status of the Benmore Station Diversion whereby water has historically been diverted from the Wairepo upstream from the homestead, around behind the homestead and into the headwaters of the Willowburn catchment. With the introduction of the Benmore Irrigation Scheme which takes 4 m3/s from the Ohau for irrigation of some 4000 ha (including land to be irrigated under applications CRC011940 and CRC991473), any requirement to continue diverting water from the Wairepo into the head waters of the Willowburn for irrigation purposes would, I would have thought, have been rendered redundant.

141. If the Benmore Scheme does not or cannot service the areas concerned then that scheme's consent (CRC981619.1) needs to be varied to reflect that change in either allocation and application area. I do not support multiple source takes or what is typically referred to as 'double dipping'. I understand that some of the applicants hold shares within Benmore Irrigation Scheme and are applying for additional consents.

142. I note that Ms Penman exempts application CRC011940 (McAughtrie et al) from any compliance with the Wairepo Stream minimum flows on the basis that the take is from an existing race for which W H and A J Sutherland hold the necessary consents to take. If this is the case, why the need for the McAughtrie application? Is it to extend the authority of the Sutherland consent and if so then I would have thought a variation to that consent would be more appropriate.

143. Rule 2 Table 3 (viii) sets out the rules surrounding allocation and minimum flows for Wairepo Stream. These are:

a) For the Wairepo stream upstream from SH8; a minimum flow of 30 l/s at the point where the creek is closest to Lake Ohau Road (interpreted as map reference H39:710464).

b) For the Wairepo catchment downstream from SH8; a minimum flow of 30 l/s upstream from Wairepo Lagoon (H39:763517)

c) For the whole catchment (i) an allocation limit of 200 l/s and (i) a flow sharing threshold of 300 l/s upstream from Wairepo Lagoon.

144. I note the summary prepared by Ms Penman. She concludes that existing consents (CRC020364, CRC940233B, and CRC940428C) total 220 l/s; marginally in excess of the allocation limit of 200 l/s. This leads to the conclusion that any replacement or new application would need to comply with the threshold provision. This includes applications CRC011940, CRC012291, CRC042022, CRC042025 and CRC082211.

145. If approved, these consents would be subject to a 300 l/s minimum flow as measured at Wairepo Lagoon. Additionally, I recommend a 1:1 sharing for flows in excess of that minimum. With the four consents adding to 132 l/s, this would mean that the consents could not be fully exercised until flows at that site exceeded 564 l/s.

Remaining applications

146. The remaining applications before you involve the taking of water either directly from existing hydro canals and lake bodies.

147. From a hydrological point of view, the applications seeking to take from the hydro canals and lakes pose little or no risk to instream values and provided that (i) the minimum lake levels and (ii) the allocations, specified in Rule 6 Table 5 for each of the three principal hydro lakes, Tekapo, Pukaki and Ohau, are complied with.

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Frank Scarf
3 December 2009

References:

The National Water Conservation (Ahuriri River) Order (1990)

Waitaki Catchment Water Allocation Regional Plan (Adopted 2006)

Waitaki Catchment Water Allocation Regional Plan (Adopted 2006) – Annex 1

S42A reports prepared by ECan officers

Gabities S. and Horrell G. (2005): Seven day mean annual low flow mapping of the tributaries of the Waitaki River. Environment Canterbury Report R05/16.

ATTACHMENT THREE – TABLE OF MINIMUM AND MEAN FLOWS AS ASSESSED BY CANTERBURY REGIONAL COUNCIL

Table 3 category	Tributary	Location of min flow site	Mean Annual low flow (l/s)	5Y7D low flow (l/s)	Mean flow (l/s)
Row i - High Natural Character Water Bodies	Mistake River	NZMS 260 I37:080-040	520	n/a	n/a
	Cass River	NZMS 260 I37:062-007	4550	n/a	n/a
	Station Stream	NZMS 260 I36:125-212	320	n/a	n/a
Row xxii – All other Rivers and Streams	Ahuriri River East Branch	NZMS 260 G39: 483-355	n/a	400	2060
	Shepherds Creek	NZMS 260 H39:866-356	n/a	60	320
	Coal Creek	NZMS 260 H39:866-356	n/a	29	140
	Manuka Creek	NZMS 260 H39:541-225	n/a	65	400
	Otamatapaio River	NZMS 260 H40:759-168	n/a	200	1120
	Scrubby Creek	NZMS 260 H39:855-440	n/a	30	150
	Stony River	NZMS 260 I39:909-451	n/a	200	1700
	Sutton Stream	NZMS 260 I39:967-216	n/a	80	280
	Glen Bouie Creek	NZMS 260 H40:792-084	n/a	10	90
	Omarama Stream	NZMS 260 H40:612-154	n/a	160	453

Appendix 2

Consent details

Details for CRC952547

Resource Consent Number:	CRC952547
File Number:	CO6C/08074
Client Name:	The Wolds Station Limited
To:	to take water from the Tekapo-Pukaki Canal, at or about map reference I38:010-788, for stockwater and border-dyke irrigation of up to 250 hectares.
Consent Location:	State Highway 8, FAIRLIE
State:	Current

Use the tabs below to find out further information about CRC952547.

Summary Documents Location Map Irrigation Restrictions

Events:

26/06/1998	Consent Commenced
26/06/1998	Given Effect To
26/06/2000	Lapse Date if not Given Effect To
22/05/2007	1st Status Query Letter
24/06/2033	Consent Expires

Subject to the following conditions:

1	The rate at which water is taken shall not exceed 350 litres per second.
2	The taking of water in terms of this permit shall cease for a period of up to 48 hours on notice from the Canterbury Regional Council, to allow measurement of the flow in the Tekapo Pukaki Canal.
3	When requested in writing by the Canterbury Regional Council, the hours and rate at which water is taken shall be recorded to within an accuracy of 10 percent. A copy of the records shall be provided to the Canterbury Regional Council when requested
4	The Canterbury Regional Council may annually, on the last working day of June,

	serve notice of its intention to review the conditions of this consent for the purposes of:(a) dealing with any adverse effect on the environment which may arise from the exercise of the consent and which is appropriate to deal with at a later stage; or(b) complying with the requirements of a relevant rule in an operative regional plan.(c) requiring that the intake is screened to prevent fish entering the race.
5	Charges, set in accordance with section 36 of the Resource Management Act 1991, shall be paid to the Regional Council for the carrying out of its functions in relation to the administration, monitoring and supervision of resource consents and for the carrying out of its functions under section 35 of the Act.