

UNDER: the Resource Management Act 1991
AND
IN THE MATTER of various resource consent applications to irrigate
land in the Upper Waitaki Catchment
BETWEEN Southdown Holdings Limited, Five Rivers Limited
and Williamson Holdings Limited
AND Canterbury Regional Council

SUPPLEMENTARY EVIDENCE OF GREGORY IAN RYDER

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1. INTRODUCTION

- 1.1 My full name is Gregory Ian Ryder. I have previously prepared and presented evidence at the hearing in relation to the resource consent applications lodged by Five Rivers Limited (Ohau Downs), Southdown Holdings Limited (Glen Eyrie Downs) and Williamson Holdings Limited (Killermont Station). The introduction and background sections of my evidence in chief detail my qualifications and involvement in the applications. I repeat the confirmation that I have read and agree to comply with the Code of Conduct for Expert Witnesses in the Environment Court Practice Note (2006).
- 1.2 In this supplementary evidence I respond to several issues raised in the amended Section 42A reports and by a number of submitters, namely Meridian Energy, Department of Conservation and Fish & Game.

2. SCREENING INTAKES FOR FISH

- 2.1 Concerns regarding the effects of the proposed intakes on fish have remained with the reporting officer (Ms Susannah Vessey) and Dr Allibone for the Department of Conservation.
- 2.2 Dr Meredith (Environment Canterbury) appears to be more comfortable with the gallery intakes now proposed for Fiver Rivers and Southdown Holdings (Lake Ohau) and Williamson Holdings (Ahuriri River) subject to appropriate design, installation, and maintenance scrutiny to ensure that adequate fish exclusion performance is maintained. I agree with this approach. Conditions on performance criteria for fish exclusion at gallery-type intakes already exists on some consents in Canterbury and I see no reason why they cannot be developed for this application.
- 2.3 Environment Canterbury reporting officers (Ms Vessey paragraph 145) have recommended that a condition developed by Environment Canterbury in relation to fish screening for gallery intakes be included in consent

conditions for individual farms. After viewing these recommended conditions¹, I consider they are reasonable and appropriate for inclusion as conditions for individual farm consents, and they now form part of the proposed conditions.

- 2.4 Dr Allibone's (Department of Conservation) concerns surrounding intake screening for fish appear to relate primarily to the cumulative effects of the water takes and accepts that the effects will be less than minor for individual takes. He has expressed particular concern over larval koaro (a common migratory galaxiid species) which migrate downstream from headwater streams to the lake. This species is widely distributed throughout the South Island. While the exact time of year downstream migration takes place in MacKenzie Basin rivers is unknown, it is known that the larvae hatch during high flow events and subsequently will tend to move downstream during these freshes. Under such conditions, assuming irrigation is taking place, the ratio of abstraction to river flow will be high and consequently I do not see the risk of entrainment into gallery intakes to be a significant issue under such conditions.

3. EFFECTS ON OHAU C CANAL

- 3.1 Meridian Energy remains concerned over the effects of increased nutrient inputs to the Ohau C Canal. Ms Sutherland (NIWA) considers the individual applications by Southdown Holdings Limited and Five Rivers Limited have not adequately assessed the implications of their landuse intensification on the Wairepo Arm and associated Ohau B-C Canals.

¹ recommended conditions include:

- (a) Design plan for the gallery specifying gallery dimensions;
- (b) Detail of depths and sizes of layers of gravel over the gallery (photographic evidence to be provided of this);
- (c) Any ongoing maintenance required by the manufacturer is carried out in accordance with their specifications;
- (d) Report provided to the Canterbury Regional Council upon construction of the gallery demonstrating compliance with factors above. Photos should be included showing key stages of construction (as once gallery is completed unable to see it from the surface).
- (e) Certification by a person with experience in fresh water ecology (exotic and native fisheries) and fish screening techniques that the gallery has been designed and constructed in a manner that ensures the principals of the NIWA fish screening guidelines are met.

- 3.2 As I discussed in my evidence in chief, these canals are far from natural systems and to suggest they warrant nutrient management as though they were a high quality river ecosystem is in my opinion overstating their ecological values. Ms Sutherland's report attached to the memo from Meridian's lawyers dated 5 March 2010 discusses the distribution of Didymo in the canal and indicates that the Pukaki and Ohau canals were dewatered in late 2009 in order to undertake maintenance of the canal walls. Such activities are hardly natural, but reflect the primary nature of the canal system – to efficiently convey water for hydro generation.
- 3.3 Regardless of the debate over the ecological values of these canals, it is my understanding that there will be relatively modest potential increases in the nutrient inputs to the Ohau C Canal (approximately 6-8% increase in relation to the Wairepo sub catchment when measured at the Ohau C Canal). I do not anticipate that such increases will result in a significant change to the plant and algae communities of the canal.

4. MONITORING

- 4.1 The approach adopted by these individual farms, and indeed MWRL, in relation to protecting the environment, is reliant on establishing a monitoring programme that firstly establishes existing environmental conditions, secondly determines acceptable levels of environmental change, and thirdly tracks or monitors indicators through time and across the Basin to provide an information feedback loop to the consent holder and the regulatory authority.
- 4.2 The monitoring framework is contained in the draft conditions of consent presented by Mr Kyle on behalf of MWRL and also as a part of these individual farm consent applications. Aspects relating to monitoring are set out at conditions 4 and 5 (Pre-irrigation monitoring at sub-catchment nodes), conditions 13 and 14 (Farm Environmental Management Plan) and conditions 29 to 39 (Sub-catchment Monitoring and Mitigation).
- 4.3 The consent holder is required to establish a sub-catchment monitoring

plan that includes, among other matters, surface water nutrient and periphyton biomass monitoring at relevant node points. Pre-irrigation monitoring is intended to establish existing maximum annual periphyton biomass. I note the development of a baseline dataset for periphyton has already commenced through the monitoring of Dr Coffey (Coffey *et al.* 2009; Coffey 2009) and more recently Ludgate and Ryder (2010) which targeted the node sites throughout the MacKenzie Basin over the 2009/2010 summer.

- 4.4 Data generated from pre-irrigation monitoring is to be compared against post-irrigation monitoring data to assess, for example, whether the 25% increase threshold for peak periphyton biomass is being met. In my view, this is a pragmatic and ecologically suitable approach to protecting key ecological values for streams and rivers of the MacKenzie Basin.
- 4.5 Farm Environmental Management Plans (FEMP) also require monitoring of surface water quality, and for individual farms, recommended monitoring points have been outlined in the amended FEMPs prepared by Dr Robson, for example Figure 11 of the Southdown Holding's Glen Eyrie Downs FEMP. These sites appear to me to be appropriate 'above-farm' and 'below-farm' surface water monitoring sites.
- 4.6 Other proposed farm monitoring conditions relating to fencing of watercourses and monitoring of aquatic biota (fish, macroinvertebrates, macrophytes and periphyton), birds and mammalian predators are sound and in my view will provide farmers, stakeholders and the regulatory authorities with robust information on the environmental effects of irrigation.
- 4.7 Having viewed further information produced since the commencement of the hearing, I have no reason to change my ecological assessments and conclusions relating to these farms as originally set out in my evidence in chief.

5. REFERENCES

- Coffey, B. 2009. Upper Waitaki Basin – Follow up Stream Surveys to Assess the Effects of Irrigation on Nutrient Runoff to Waterways. April 2009. Brian T. Coffey and Associates Limited: S.S. Up. Waitaki /GHD/ V.1 July 2009. Prepared for GHD Limited, P.O. Box 76477, Manukau City (2241).
- Coffey, B., Anthony, M. and Leckie, H. 2008. Upper Waitaki Basin – Accumulated Effects of Nutrient Runoff: Selected Stream Survey, April 2008. Brian T. Coffey and Associates Limited: S.S. Up. Waitaki /GHD/ V.2 June 2008. Prepared for GHD Limited, P.O. Box 76477, Manukau City (2241).
- Ludgate, B. and Ryder, G. 2010. Node Periphyton and Macrophyte Surveys. Prepared by Ryder Consulting Limited for Mackenzie Water Research Limited.