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*in the matter of:* the Resource Management Act 1991

*and*

*in the matter of:* a number of applications to take and use water from  
the Upper Waitaki catchment

Brief of evidence of Richard Jonathon Turner on individual applications

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Dated: 30 November 2009

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## **BRIEF OF EVIDENCE OF RICHARD TURNER ON INDIVIDUAL APPLICATIONS**

### **INTRODUCTION**

- 1 My full name is Richard Jonathon Turner.
- 2 My current position with Meridian Energy Limited (Meridian), qualifications and experience are set out in my brief of evidence dated the 16<sup>th</sup> of September 2009.
- 3 I am authorised to present this evidence on behalf of Meridian.
- 4 In preparing this evidence I have reviewed:
  - 4.1 The evidence of **Dr Coffey, Dr Ryder, Dr Robson, Dr Robson** and **Dr Bright** (joint brief) and **Mr Kyle** on behalf of Mackenzie Water Research Limited (MWRL);
  - 4.2 The legal submissions of **Mr Chapman**, planning evidence of **Mr Batty** and the evidence of **Ms McCabe, Ms Johnson** and **Ms Begley** on behalf of the Upper Waitaki Applicants Group (UWAG);
  - 4.3 The evidence of **Mr McIndoe** and **Dr Ryder** for Simons Pass, Simons Hill, Rosehip Orchards and High Country Rosehip Orchards;
  - 4.4 The legal submissions of **Mr Whata** and evidence of **Dr Bright, Dr Ryder, Dr Robson** and **Mr Kyle** on behalf of Five Rivers Limited, Southdown Holdings and Killermont Station Limited; and
  - 4.5 The evidence of **Mr Urquhart** for UWAG and Grays Hill Station.

### **SCOPE OF EVIDENCE**

- 5 In this evidence I:
  - 5.1 Identify those consent applications which remain a concern to Meridian from a cumulative water quality perspective (based on the sub-catchments in which they are located relevant to Meridian's operations and areas of interest);
  - 5.2 Outline the importance of Mackenzie Irrigation Company (MIC) applicants seeking consent in accordance with the derogation approvals they have been provided by Meridian and the common consent conditions;

- 5.3 Clarify Meridian's position in relation to consent duration for replacement applications;
- 5.4 Identify those consent applications which require specific consent conditions in relation to off-takes from Meridian's canals and hydro-generation infrastructure;
- 5.5 Meridian's position in relation to the possible take location for the Grays Hill Station application (CRC042661);
- 5.6 Why Meridian considers that compliance with nutrient thresholds at the river and lake nodes is important and necessary; and
- 5.7 Outline the non return valves located in the bed of the Ohau B – C Canal and the role they potentially play in providing a transportation route for nutrients into the canal.

#### **APPLICATIONS OF CONCERN FROM A WATER QUALITY PERSPECTIVE**

- 6 In my 'cumulative' brief of evidence I set out the issues and locations of concern to Meridian in relation to the current applications to take and use water for irrigation in the Upper Waitaki Catchment. In summary, the locations of concern to Meridian are:
  - 6.1 Lake Benmore – quantifying the nutrient thresholds to ensure that a TLI of 2.75 (based on a summer average) is not exceeded;
  - 6.2 Wairepo Arm – change in TLI in the Wairepo Arm and the implications for weed growth in the Ohau B – C Canal;
  - 6.3 Tekapo River Catchment – the approach to the establishment of the nutrient threshold for this catchment, the impact of nutrient increases on values in the river and the potential requirement for Meridian to flush periphyton and didymo; and
  - 6.4 Lower Ohau River Catchment – same issues as the Tekapo River Catchment.
- 7 These concerns still remain for Meridian, notwithstanding the evidence that has been presented by MWRL.
- 8 Given the concerns outlined in Paragraph 6 above and outlined in detail in my 'cumulative' brief of evidence, there are a number of consent applications of concern to Meridian on the basis of the cumulative water quality effects that could eventuate in the areas identified. These applications are set out in Table 1 that follows.

**Table 1 – Applications of Concern for Cumulative Water Quality Reasons**

<b>Applicant</b>	<b>Consent Numbers</b>	<b>General Drainage Catchment of Concern to Meridian</b>
Anderson KJ, SR & DK	CRC012017 CRC012019 CRC012032 CRC012033	Lake Benmore
Bellfield Land Company Ltd	CRC011987 CRC012733 CRC071649 CRC071650	Lake Benmore
Birchwood Run Limited	CRC012290 CRC012291 CRC082211 CRC082212	Ohau B – C Canal / Lake Benmore
Classic Properties Limited	CRC063106 CRC070406	Tekapo River / Lake Benmore
Dunstan Peaks Limited	CRC011361 CRC011362 CRC011363	Lake Benmore
Falconer SM, Macassey RN & Cook Allan Gibson Trustee Co Ltd	CRC060253	Lake Benmore
Five Rivers Limited	CRC061154	Ohau B – C Canal / Lake Benmore

Glentanner Station Limited	CRC071362 CRC083609 CRC092721	Lake Benmore
Grays Hills Station Limited	CRC042661	Tekapo River / Lake Benmore
Haldon Station (1991) Limited	CRC042561 CRC082268 CRC082269 CRC082270 CRC082271	Lake Benmore
High Country Rosehip Orchards Ltd	CRC072232 CRC072233	Lower Ohau River / Lake Benmore
Hope AN	CRC041542 CRC041543 CRC041545	Tekapo River / Lake Benmore
Horo, Maree	CRC042011 CRC042014 CRC042015 CRC042016 CRC042017 CRC042018 CRC042019 CRC042020 CRC042021 CRC042022	Lake Benmore

	CRC042023 CRC042024 CRC042025 CRC042026	
Irishman Creek Station Limited	CRC011845 CRC011846	Tekapo River / Lake Benmore
Killermont Station Limited	CRC040180 CRC040181 CRC041798 CRC041330 CRC041331 CRC041332 CRC041776 CRC041777	Lake Benmore
McAughtrie DW	CRC011939 CRC011940	Lake Benmore
McAughtrie DW, Ellis-Lea Farms Ltd & Greenfield Rural Opportunities Ltd	CRC991473 CRC991474 CRC991475	Lake Benmore
Otamatapaio Station (1993) Ltd	CRC012047 CRC012049 CRC012727	Lake Benmore
Rosehip Orchards NZ Limited	CRC072117 CRC072118	Lower Ohau River / Tekapo River / Lake Benmore
Simons Hill Station	CRC062842	Tekapo River /

Limited	CRC062843 CRC082304	Lake Benmore
Simons Pass Station Limited	CRC062867 CRC062869 CRC082311	Tekapo River / Lake Benmore
Southdown Holdings Limited (previously Williamson Holdings Ltd)	CRC040835 CRC040836 CRC041787 CRC041788 CRC073112 CRC073113 CRC073114 CRC073115	Ohau B – C Canal / Lake Benmore
Totara Farming Company Limited	CRC020584 CRC031315	Lake Benmore
Twin Peaks Station Ltd	CRC063564 CRC063565	Lake Benmore

- 9 The recommendations and conclusions outlined in **Mr Gimblett's** evidence (dated the 16<sup>th</sup> of September 2009) regarding cumulative water quality matters remain applicable to these applications. Those applications which are not listed in Table 1 are not considered to present potential cumulative water quality issues to Meridian's operations and interests.

#### **MIC APPLICANTS AND TERMS OF THE AGREEMENT**

- 10 In Paragraphs 78 to 82 of my 'cumulative' brief of evidence I discussed the process Meridian and Mackenzie Irrigation Company (MIC) went through to agree common consent conditions. I also explained that MIC shareholders are required to make their applications on terms requiring the inclusion of the common consent

conditions. As part of gaining derogation approval, MIC applicants were required to amend their applications with Environment Canterbury (ECan) to reflect the common consent conditions that had been agreed.

- 11 Through the course of the current hearings it has become apparent that some of the applicants (primarily through the experts they have retained) are recommending consent conditions in evidence that:

11.1 don't fully reflect the common consent conditions that were agreed between Meridian and the applicant prior to derogation approval being provided; or

11.2 make no mention of the agreed common consent conditions.

- 12 The applications that fall into these two categories are set out in Table 2 below:

**Table 2 – Applicants not complying with Derogation Approval**

<b>Applicant</b>	<b>Consent Numbers</b>
Simons Pass Station Limited	CRC062867 CRC062869 CRC082311
Simons Hill Station Limited	CRC062842 CRC062843 CRC082304
High Country Rosehip Orchards	CRC072232 CRC072233
Rosehip Orchards NZ Limited	CRC072117 CRC072118
AN Hope	CRC041542 CRC041543 CRC041545
Lone Star Farms Limited /	CRC031175

Godley Peaks	CRC031176 CRC073235 CRC073236
Aviemore Limited	CRC041031 CRC083692
Bellfield Land Company - Henburn	CRC071649
Classic Properties Limited	CRC063106 CRC070406
F I Graham	CRC072363
Glentanner Station	CRC071362 CRC083609 CRC092721
Grays Hill Station	CRC042661
Haldon Station Limited	CRC042561
Lilybank Station Holdings Limited	CRC071785 CRC071786
Horo, Maree	CRC042011 CRC042014 CRC042015 CRC042016 CRC042017 CRC042018 CRC042019 CRC042020

	CRC042021 CRC042022 CRC042023 CRC042024 CRC042025 CRC042026
Otematata Station	CRC020355 CRC041033 CRC052739 CRC052740 CRC052741 CRC052742 CRC052743
Totara Farming Limited	CRC020584 CRC031315
Twin Peaks Station Limited	CRC063564 CRC063565
Waitangi Station Limited	CRC030944 CRC031013 CRC031014
SJB Munro	CRC060938

- 13 As **Ms Appleyard** has noted in her legal submissions, MIC applicants are required to make their applications on terms consistent with the common consent conditions developed by Meridian and MIC. Failure to do so means that derogation approval will either not be provided or, as is the current situation, derogation approval will be revoked by Meridian if the applicants do not amend

their evidence to confirm that the common consent conditions form part of the conditions they are seeking.

- 14 Meridian expects that the applicants listed in Table 2 will clarify the conditions of consent they are seeking before the close of this hearing.

**CONSENT DURATION FOR REPLACEMENT APPLICATIONS**

- 15 During his opening legal submissions for UWAG, **Mr Chapman** made comment that UWAG took issue with Meridian seeking to restrict the term of consent for replacement applications to the expiry of the resource consents for the Waitaki Power Scheme; being April 2025.
- 16 While Meridian is seeking (through agreed consent conditions with MIC) that MIC applicants are not granted resource consent for a term longer than the expiry date for the resource consents for the Waitaki Power Scheme, Meridian has not made comment, through its submissions or evidence to date, on the appropriate maximum term of consent for any 'pure' replacement applications.
- 17 In terms of what is an appropriate term of consent for replacement applications, should you be of a mind to grant resource consent, Meridian considers that the term should be decided with particular consideration given to the potential cumulative water quality effects associated with the current applications and the need to re-evaluate the water quality effects in the future to determine whether the predictions of effects were accurate. **Mr Gimblett** is able to provide further advice on the issue of term of consent on behalf of Meridian if it is required.

**APPLICATIONS REQUIRING CONDITIONS IN RELATION TO OFF-TAKES FROM CANALS**

- 18 As you will be aware, some applicants are proposing to take water from the network of hydro-electricity canals that form part of the Waitaki Power Scheme. These applications are set out in Table 3 below.

**Table 3 – Applicants Proposing Canal Takes**

Applicant	Canal	Consent Numbers
Simons Pass Station Limited	Tekapo Canal or Pukaki Canal	CRC062867 CRC062869 CRC082304

Simons Hill Station Limited	Tekapo Canal or Pukaki Canal	CRC062842 CRC062843 CRC062304
Glentanner Station Limited	Tekapo Canal or Pukaki Canal	CRC071362 CRC083609 CRC092721
Rosehip Orchards NZ Limited	Ohau B – C Canal	CRC072117 CRC072118
High Country Rosehip Orchards	Ohau B – C Canal	CRC072232 CRC072233
Classic Properties	Tekapo Canal	CRC063106 CRC070406

- 19 Meridian has provided derogation approval for all of the applications listed in Table 3 at the take locations specified. Meridian had also submitted on the listed applications in relation to potential civil safety issues associated with the construction and operation of off take structures on the canal embankments.
- 20 At the time of writing Paragraph 88 of my 'cumulative' brief of evidence I outlined that Meridian had concerns with the design and location of the off take for the Rosehip Orchards NZ Limited application. I can now advise that Meridian's concerns with the Rosehip Orchards off take were resolved on the 11<sup>th</sup> of November 2009 and as such the aspects of our submissions concerning potential civil safety issues in relation to off take structures have been resolved. **Ms Ensor** of ECan has been informed of this situation.
- 21 It is nevertheless noted that Meridian and the applicants listed in Table 3 will need to re-engage if resource consents are granted to advance the designs from concept level to detailed design, confirm arrangements for remote operation where appropriate and which sections of the off take structures will be owned by Meridian (as per the Meridian – MIC Agreement), amongst other things.

22 Meridian has also agreed common consent conditions with MIC and the MIC applicants listed in Table 3 to ensure the hydro-electricity canals are suitably protected during maintenance or other works and if flow patterns in the canals change. In this respect, the two conditions that have been proposed and agreed between Meridian and the MIC applicants are as follows:

*"The taking of water in terms of this consent shall cease for a period required by the owner and/or operator of the Waitaki Power Scheme, where the owner and/or operator considers it necessary to undertake maintenance on, to ensure the structural integrity and safety of, or to avoid risk or compromise to the operation of, the Waitaki Power Scheme.*

*The taking of water in terms of this consent shall cease whenever the owner and/or operator of the Waitaki Power Scheme ceases to take, divert and/or discharge water into the **[insert relevant name – Tekapo, Pukaki – Ohau, and Ohau]** Canal(s), unless the owner and/or operator of the Waitaki Power Scheme gives written agreement to the continuation of take".*

23 The justification for these conditions from an asset management and operational perspective are set out in Paragraphs 81.8 to 81.10 of my 'cumulative' brief of evidence. Without repeating the justification already provided, I do want to emphasis that the conditions are designed to ensure that the off take structures and associated water takes do not impinge on the operation, maintenance and civil safety of the hydro-electricity canals which form part of the Waitaki Power Scheme. As such, I recommend that these conditions be included on any consents you choose to grant for the applications set out in Table 3.

24 On a related matter, Meridian has placed conditions on the derogation approvals granted for lake and canal takes to limit the taking of water when the applicable lake levels fall to a certain limit.

25 The purpose of specifying a minimum lake level was to link the ceasing of the irrigation takes with the normal minimum operating levels for the applicable hydro lakes. The applications with a derogation approval specifying a minimum lake level are set out in Table 4.

**Table 4 – Minimum Lake Levels**

<b>Applicant</b>	<b>Consent Number</b>	<b>Take Location</b>	<b>Minimum Level Specified in Derogation Approval</b>

Simons Pass Station Limited	CRC062867 CRC062869 CRC082304	Lake Pukaki or Pukaki Canal or Tekapo Canal	518m a.m.s.l for Lake Pukaki and 701.8m a.m.s.l (April to September) and 704.1m a.m.s.l (October to March) for Lake Tekapo
Simons Hill Station Limited	CRC062842 CRC062843 CRC062304	Lake Pukaki or Pukaki Canal or Tekapo Canal	518m a.m.s.l for Lake Pukaki and 701.8m a.m.s.l (April to September) and 704.1m a.m.s.l (October to March) for Lake Tekapo
Glentanner Station Limited	CRC071362 CRC083609 CRC092721	Lake Pukaki	518m a.m.s.l for Lake Pukaki and 701.8m a.m.s.l (April to September) and 704.1m a.m.s.l (October to March) for Lake Tekapo
Five Rivers Limited	CRC061154	Lake Ohau	519.45m a.m.s.l
Southdown Holdings Limited	CRC041788 CRC073115 CRC040835	Lake Ohau	519.45m a.m.s.l
Otamatapaio Station Limited	CRC021330	Lake Benmore	355.25m a.m.s.l
Munro, SJB	CRC060938	Lake Aviemore	267.7m a.m.s.l
Aviemore Limited	CRC083692 CRC041031	Lake Aviemore	267.7m a.m.s.l
Waitangi Station	CRC030944	Lake Aviemore	267.7m a.m.s.l

Limited			
Otematata Station Limited	CRC020355	Lake Waitaki	227m a.m.s.l
Rosehip Orchards	CRC072118	Ohau B – C Canal (sourced from Lake Pukaki and Lake Ohau)	518m a.m.s.l for Lake Pukaki and 519.45m a.m.s.l for Lake Ohau
High Country Rosehip Orchards NZ Limited	CRC072233	Ohau B – C Canal (sourced from Lake Pukaki and Lake Ohau)	518m a.m.s.l for Lake Pukaki and
Classic Properties Limited	CRC063106 CRC070406	Tekapo Canal	701.8m a.m.s.l (April to September) and 704.1m a.m.s.l (October to March) for Lake Tekapo

- 26 If you are of a mind to grant consent to the applications listed in Table 4, then the conditions of consents should specify the applicable minimum lake level set out in Table 4 for the cessation of the water take.

#### **GRAYS HILL STATION APPLICATION – CRC042661**

- 27 The evidence of **Ms Begley** for Grays Hill Station Limited outlines a proposal to take and use groundwater from two galleries (I38/0057 and I38/0058) at a combined maximum rate of 100 litres per second on the Grays Hill property. The annual allocation associated with this application is 1,140,000 cubic metres per annum. This was the basis for the derogation approval provided by Meridian in September 2009.
- 28 The evidence of **Mr Urquhart** of Grays Hill Station for UWAG states that he would like his water take to be released from Lake George Scott to at least help enhance the Tekapo River. I note that this proposal was not part of the resource consent application lodged by Grays Hill Station and is not provided for in the derogation approval that was issued by Meridian. As such, Meridian does not consider that the proposal of water being released from Lake George Scott to

the lower Tekapo River for later abstraction by Grays Hill Station can be contemplated in your decision making on CRC042661.

- 29 Notwithstanding that Grays Hill Station's application and derogation approval does not contemplate the release of water from Lake George Scott, Meridian does not consider the option proposed by **Mr Urquhart** appropriate and does not agree to it.
- 30 As is outlined in the evidence of **Ms Moss** (Paragraph 32), Lake George Scott is formed by a dam structure across the bed of the Tekapo River adjacent to the Tekapo Canal. The dam structure has an overflow weir which allows water (primarily flood flows) to be spilled to the lower Tekapo River. Lake George Scott also has a radial gate sluice structure which allows flow to be diverted into the Tekapo Canal.
- 31 The overflow weir can only generate spill flow into the lower Tekapo River by the level of Lake George Scott rising above the weir level. That is, there are no gates that can be opened to spill water. Given this, water would need to be released from Tekapo Lake Control in order to raise Lake George Scott to a level that would manufacture a spill down the lower Tekapo River.
- 32 An aerial photograph of Lake George Scott, the Tekapo Canal and the Tekapo River is attached as **Annexure 1** to this evidence.
- 33 It should be noted that these structures are designed to pass significant volumes of water; Tekapo Lake Control is capable of passing 850 cumecs and the radial gate at Lake George Scott is capable of passing 130 cumecs. The expectation of being able to efficiently release water from Tekapo Lake Control to manufacture a spill over the overflow weir in order to enable Grays Hill Station abstract 100 litres per second several kilometres downstream would be particularly difficult (if not impossible).
- 34 If **Mr Urquhart** does not want to utilise groundwater for his irrigation take then we would suggest he consider taking water from the Tekapo Canal and siphoning the take under the Tekapo River to his property.

#### **COMPLIANCE WITH SUB-CATCHMENT NUTRIENT THRESHOLDS**

- 35 MWRL and the consent conditions proposed by **My Kyle** for Southdown Holdings, Five Rivers and Killermont Station propose monitoring at the sub-catchment nodes and compliance triggers if the nodes exceed either 75 or 100% of the thresholds established. Meridian is supportive of this approach, subject to the amendments to the consent conditions proposed by **Mr Potts** and **Mr Gimblett** in

their evidence and our concerns regarding the actual threshold limits proposed.

- 36 Meridian supports this approach as it will ensure that the consent holders take appropriate action if cumulative effects occur in the river and lake sub-catchments. From Meridian's perspective it is important that there are identified parties who are held responsible for remedying any exceedance of the threshold limits.
- 37 **Mr Chapman** and **Mr Batty** for UWAG appear to suggest in legal submissions and evidence that monitoring at the sub-catchment nodes should occur but that these nodes should not be used to assess compliance. In this respect, I understand that they are suggesting that if the threshold limits at the sub-catchment nodes are exceeded but individual consent holders are complying with their on farm nutrient discharge allowances then no remedial action should be required of the consent holders.
- 38 Meridian does not support this approach. As I have explained in my 'cumulative' brief of evidence, Meridian is concerned with potential cumulative water quality effects in areas such as the Wairepo Arm and the Tekapo River and ensuring that water quality conditions do not present that cause operational issues or mitigation requirements for the Waitaki Power Scheme.
- 39 If the approach outlined by **Mr Chapman** and **Mr Batty** was adopted and the threshold limits were exceeded at the sub-catchment nodes, it would seem that cumulative effects could occur at the sub-catchment nodes but no-one would be held accountable to remedy this situation. Given the potential cumulative adverse effects associated with an intensification in land use, it is imperative that consent holder are required to comply with their on-farm nutrient discharge allowances and the threshold limits at the sub-catchment nodes.
- 40 The consent conditions that Meridian considers would be appropriate to manage compliance with on-farm nutrient discharge allowances and sub-catchment node thresholds (should the grant of consent become an option for the Commissioners) are explained in the evidence of **Mr Potts** and **Mr Gimblett**.

#### **NON RETURN VALVES IN OHAU B – C CANAL**

- 41 I have recently been advised by Meridian's engineering team that groundwater is able to enter the Ohau B – C Canal. Non return valves are located on the floor of the canal bed which allow groundwater to enter the canal when the groundwater level is higher than the canal water level. In this respect, these valves allow groundwater to enter the canal system but are not designed to allow canal water to enter groundwater. The purpose of the valves

is to relieve the build up of groundwater pressure in the land surrounding the canals. They were implemented during construction of the canals.

- 42 The valves are located throughout all of the canals that form part of the Waitaki Power Scheme (being the Tekapo, Pukaki, Ohau and Ohau B-C Canals). The valves are approximately 1m high and have a diameter of 300 – 450mm. They are placed at distances of approximately 50 – 70m apart along the canal floor.
- 43 The valves in the Ohau B-C Canal represent another potential location of nutrients into the canal system (along with nutrients sourced from the Wairepo Arm). The evidence of **Ms Sutherland** discusses the growth patterns of didymo in the Ohau B – C Canal and the potential reasoning by the growth patterns that are emerging.

Dated: 30 November 2009

A handwritten signature in black ink, consisting of several overlapping loops and a long horizontal stroke extending to the right.

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Richard Turner

**ANNEXURE ONE**