

**BEFORE THE ENVIRONMENT COURT
I MUA I TE KOOTI TAIAO O AOTEAROA**

UNDER the Resource Management 1991
IN THE MATTER of appeals under Clause 14 of the First Schedule of the Act

BETWEEN **TRANSPower NEW ZEALAND LIMITED**
(ENV-2018-CHC-26)

FONterra CO-OPERATIVE GROUP
(ENV-2018-CHC-27)

HORTICULTURE NEW ZEALAND
(ENV-2018-CHC-28)

ARATIATIA LIVESTOCK LIMITED
(ENV-2018-CHC-29)

WILKINS FARMING CO
(ENV-2018-CHC-30)

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**STATEMENT OF EVIDENCE OF PAUL DAVID MARSHALL ON
BEHALF OF ARATIATIA LIVESTOCK LIMITED
15 February 2019**

Judicial Officer: Judge Borthwick and Judge Hassan

**GORE DISTRICT COUNCIL, SOUTHLAND DISTRICT
COUNCIL & INVERCARGILL DISTRICT COUNCIL**
(ENV-2018-CHC-31)

DAIRYNZ LIMITED
(ENV-2018-CHC-32)

H W RICHARDSON GROUP
(ENV-2018-CHC-33)

BEEF + LAMB NEW ZEALAND
(ENV-2018-CHC-34 & 35)

DIRECTOR-GENERAL OF CONSERVATION
(ENV-2018-CHC-36)

SOUTHLAND FISH AND GAME COUNCIL
(ENV-2018-CHC-37)

MERIDIAN ENERGY LIMITED Act 1991
(ENV-2018-CHC-38)

ALLIANCE GROUP LIMITED
(ENV-2018-CHC-39)

FEDERATED FARMERS OF NEW ZEALAND
(ENV-2018-CHC-40)

HERITAGE NEW ZEALAND POUHERE TAONGA
(ENV-2018-CHC-41)

STONEY CREEK STATION LIMITED
(ENV-2018-CHC-42)

THE TERRACES LIMITED
(ENV-2018-CHC-43)

CAMPBELL'S BLOCK LIMITED
(ENV-2018-CHC-44)

ROBERT GRANT
(ENV-2018-CHC-45)

**SOUTHWOOD EXPORT LIMITED, SOUTHLAND
PLANTATION FOREST COMPANY OF NZ,
SOUTHWOOD EXPORT LIMITED**
(ENV-2018-CHC-46)

**TE RUNANGA O NGAI TAHU, HOKONUI RUNAKA,
WAIHOPAI RUNAKA, TE RUNANGA O AWARUA & TE
RUNANGA O ORAKA APARIMA**
(ENV-2018-CHC-47)

PETER CHARTRES
(ENV-2018-CHC-48)

RAYONIER NEW ZEALAND LIMITED
(ENV-2018-CHC-49)

**ROYAL FOREST AND BIRD PROTECTION SOCIETY OF
NEW ZEALAND**
(ENV-2018-CHC-50)

Appellants

AND

SOUTHLAND REGIONAL COUNCIL

Respondent

Introduction

- 1 My full name is Paul David Marshall.
- 2 This evidence describes the relationship and history that my family and our business entity Aratiatia Livestock Ltd have had with the lower Waiau River and how Objective 10 and specifically the Manapouri Lake Control Structure (**MLC Structure**) impact on us and on the River.
- 3 I hold a B.Agr.Econ (Hons) ¹ in Natural Resource Economics (1981) from Massey University. Between 1981 and 1986 I was employed first as a NZ Treasury Investigating Officer in its Land Use Division and then as an Economist in the Banking Section of the Reserve Bank of NZ, Wellington.
- 4 Since 1986 I have lived and worked on the 600ha farm now owned by Aratiatia Livestock Ltd (**Aratiatia**) located at Motu Bush, Western Southland (**the Property**). I am a director and minority shareholder (1 share of 1200 on issue) of Aratiatia and a beneficiary of the PD and JP Marshall Family Trust which holds 1198 shares in Aratiatia.
- 5 My wife Juanita is the other director and minority shareholder. I am authorised to give this evidence on behalf of Aratiatia and Juanita. Our daughter Claire and her husband live on the Property with their children, and are involved in its operation.

Property location and operation of the MLC Structure

- 6 The Property has as its eastern boundary the lower Waiau River. That boundary is approximately 1 km upstream of the River's confluence with the Wairaki River.
- 7 The Property was purchased by Juanita's Family in May 1966, two years before the Manapouri Power Scheme (**MPS**) was commissioned and some six years prior to when the MLC Structure, which is located immediately downstream of the confluence of the Mararoa River and the Lower Waiau River (approximately 10 kilometres downstream of Lake Manapouri), became fully operational in 1972.

¹ The title of my Honours dissertation was "Marginal Cost Pricing and Retail Electricity Supply"

- 8 The Property falls into Class E of the Waiau District Rate Scheme and as such contributes directly to the funding of the annual works programme along the mainstem of the Waiau River. The annual works programme has as its core elements the spraying of the main riverbed to maintain a clear flood channel, and the maintenance of the berm fences from the MLC Structure to Te Waewae Bay.
- 9 The MLC Structure is a large weir that governs flows from the Waiau and Mararoa Rivers into the lower Waiau. Whilst it is 10 kilometres downstream from Lake Manapouri, it is of sufficient size to enable water from the Mararoa River to back up into the lake.
- 10 Between 1972 and 1996 no minimum flow through the MLC structure was mandated. As a consequence, the MLC Structure gave the electricity generator the ability to divert 100% of the flow that would otherwise have flowed down the Lower Waiau River, through the MPS and into Doubtful Sound, subject to any operational guidelines established by the Guardians of the Lakes.² In 1996 a new resource consent was granted for the MPS which established seasonal minimum flows between 12 and 16 cumecs at the MLC Structure³.

Waiau River Working Party and 1996 MPS Resource Consent

- 11 In 1990 the then owner of the MPS, ECNZ, called together and funded a working party of cross-sectoral and regulatory interests (the Waiau River Working Party) ahead of the resource consenting of the MPS. That process was eventually concluded in 1996 and resulted in the granting of resource consents.
- 12 I was a foundation member of that Working Party. I was involved in the negotiation which resulted in the signing of the 1996 Waiau Agreement⁴ by the Southland Regional Council, ECNZ and Southland Federated Farmers (as the representative body for affected farmers on the lower Waiau).

² Section 6X of the Conservation Act 1987 established the Guardians of Lakes Manapouri, Monowai and Te Anau

³ SRC Resource Consent Number 96022 19 December 1996

⁴ Ref the 1996 Waiau Agreement

- 13 The 1996 Waiau Agreement set out the agreed expectations of the parties as to how the consent holder would manage flows into the lower Waiau River through the MLC Structure. The agreement:
- a Provided that the annual works programme for the lower Waiau weed control (to maintain a clear floodway) and berm fence maintenance would be funded by an annual payment from the consent holder of \$200,000 (indexed by the Construction Cost Index) augmented by rate revenue from a newly created Waiau District Rating District, to be matched dollar-for-dollar by the consent holder.
 - b Addressed the question of damage from erosion and remedial action to be taken in the event of damage from erosion occurring. The text of the 1996 Waiau Agreement which concerned those two matters was exactly reproduced as conditions 5 (a) and (b) in the Water Permit granted for the MPS⁵.
- 14 The Waiau River Liaison Committee was also formed in 1996 to govern the annual works programme on the lower Waiau, supervised by the Regional Council. I was a foundation member of that committee and am today a member of the Liaison Committee's steering committee. The Liaison Committee endeavoured unsuccessfully to become a section 274 party to these proceedings.

Southland's Development and MTADA 1963⁶

- 15 The European settlement and development of Southland is a story of the exploitation of abundant natural resources -indigenous forests were clear-felled, native bush was cleared and burned to make way for farm land, wetlands were systematically drained, and rivers straightened to facilitate the drainage of much of Southland's plains. I recognise that the empowering legislation for the MPS development enacted in 1963 (MTADA) embodied the same development ethos. Abundant freshwater resources simply flowing to the sea could be harnessed through the MPS.
- 16 The exploitative paradigm which the MTADA 1963 embodied has changed. As a nation we no longer see water as a free good. Rather it is

⁵ SRC Resource Consent Number 96022 19 December 1996

⁶ MTADA 1963 – Manapouri-Te Anau Development Act 1963.

recognised as a national Taonga – a treasure to be carefully stewarded. The pSWLP will regulate the next consenting process for the MPS in 2031. In my opinion, to constrain that process by defining the MPS infrastructure as part of the existing environment would be lock the regulator into a 1963 mindset.

The relationship between the Mararoa Weir (MLC Structure), the Mararoa River, Lake Manapouri and the lower Waiau River.

- 17 Pre control, the lower Waiau River drained Lake Manapouri. The flow from the Lake was pristine alpine water in the order of 500cumecs. That water quality was a consequence of the largely unspoiled mountainous country that comprised and still comprises the Waiau River's catchment.
- 18 10kms downstream from the Lake Manapouri outlet, the Mararoa River entered the lower Waiau River. On average the Mararoa River had a flow of 35cumecs, which remains the case today. The Mararoa River has historically carried a much higher sediment load than has the Waiau River above their confluence, because a greater proportion of the Mararoa River catchment is pasture. Irrespective of the Mararoa River's turbidity, however, its overall impact on the clarity of the lower Waiau River was negligible because the Mararoa River contributed a relatively small proportion of the downstream flow. The ratio of alpine water from the Waiau River to (at times) sedimented Mararoa water, at the confluence was more than 9:1.
- 19 Post control (after 1972 when the MLC Structure had been commissioned) the Weir allowed the Mararoa water to back up and flow into Lake Manapouri. In effect, the operation of the Weir has allowed the electricity generator to reverse the historic ratio of alpine water to (at times) sedimented Mararoa water⁷ downstream of the MLC Structure. Today the ratio is closer to 1:9. That is, less than 10% of the water flowing down the lower Waiau River below the MLC Structure is alpine (Waiau) water. The total quantity of water flowing down that stretch of the River is also less than 10% of the pre-MPS flow.

⁷ As noted in paragraph 7, no minimum through the Mararoa weir was mandated, which meant that often the 10km stretch of River bed from the Mararoa weir to the confluence of Redcliff Stream was dry. After 1996 with Resource Consent 96022 in place, a minimum consented through the Weir of between 12 and 16cumecs was required.

20 The result is that very little alpine water from Lake Manapouri now flows down the lower Waiau. The minimum flow requirements in the River are met with water from the Mararoa. Combined with the diversion of approximately 95% of the pre-control flow, the 1:9 ratio means that the flow in the lower Waiau is now, for the most part highly sedimented, often with insufficient energy to flush the gravels and sediment through the Te Wae Wae Lagoon and out into Te Wae Wae Bay. My observation is that the lack of flow through the Waiau mouth that has led to the stripping of sand from Blue Cliffs Beach and the consequential collapse of the Toheroa and flounder fishery.

Over-allocation of the Lower Waiau River

21 I understand that the National Policy Statement on Freshwater Management (**NPSFM**) (Objective B2) requires every regional council to avoid any further over-allocation of freshwater and phase out existing over-allocation. The Hearing Commissioners for the proposed Southland Water and Land Plan (**pSWLP**) received advice⁸ from the SRC that no water body in Southland was overallocated. This advice included the lower Waiau River despite the consent provisions which permit the diversion of over 95% of the pre-control flow through the MPS to Deep Cove and Doubtful Sound⁹.

22 In May 2018 Aratiatia lodged LGOIMA request with the SRC seeking ...

“All advice (including legal advice, planning advice, science advice, Council items, public excluded items, council workshop briefing papers and emails) to the Southland Regional council on the proposed Southland Water and Land Plan pertaining to water allocation in the Waiau catchment”:

On 13 June 2018 the SRC responded¹⁰:

a. There were no specific discussions or advice provided regarding water quantity or allocation in relation to the pSWLP, and none in relation to the Waiau Catchment.

23 We are concerned that the SRC provided that advice to the Hearing Commissioners, it appears, without any evidence to support the assertion.

⁸ pSWLP Hearing Commissioners Report [55] Page 12

⁹ pSWLP Reply Report para. 4.303

¹⁰ See Email response 13 June 2018 – Lucy Hicks SRC

The Hearing Commissioners appear to have based their decisions on the Waiau on the advice from Council with respect to over-allocation, without evidence to support.

24 On 24 October 2018 I was part of a delegation that met with SRC Councillors and its CEO to discuss the situation in the lower Waiau River. That group received an undertaking that Council would initiate first a hydrological study followed by an ecological study, to address the question of the impact on the life-supporting capacity of the lower Waiau River of the MPS. Neither of those studies have been initiated to date.

25 In my view the River is, and has for 50 years been, overallocated as a consequence of the MPS, with the result that the ecological values of the river and the coastal area adjacent to the river mouth have been severely compromised.

Adverse Effects arising from Overallocation to the MPS

Algal Blooms in the River

26 I am concerned that the MLC structure allows the consent holder to divert highly sedimented flows from the Mararoa River without sufficient dilution of alpine water from Lake Manapouri, as would have naturally been the case. As a consequence, the lower Waiau River is frequently discoloured. During December 2018 and January 2019 toxic cyanobacteria blooms were found in the Waiau River at Tuatapere. Cyanobacteria blooms are associated with high temperature, low flows and high levels of sediment and nutrient¹¹.

27 To address algal blooms in the River the consent holder has an established protocol with the Waiau River Working Party to periodically “flush” the lower Waiau with a pulse of water discharged through the Weir. On 29/1/19, Meridian Energy Ltd (MEL) advised the Working Party that an extended flushing flow would be released from the Weir on 30/1/19. I observed from the Clifden Bridge that the flushing flow did occur but the flow was again of highly sedimented water.

¹¹ LAWA.org.nz/get-involved/newsandstories/enviromentsouthland ; Toxic Algae found in Waiau River at Tuatapere

- 28 I do not want the status quo enshrined. Toxic algal blooms are unacceptable and are arguably a consequence (at least in part) of the current form and mode of operation of the MLC Structure. That structure should not be deemed to be part of the existing environment.

Te Wae Wae Lagoon

- 29 The Waiau River has as its receiving body the Te Wae Wae Lagoon – like Southland’s other estuaries and lagoons, it is choked with sediment. I consider that the causative factors are quite distinctive in the case of the Te Wae Wae Lagoon, however.

- 30 Many Southland water bodies and wetlands are heavily sedimented because of intensive pastoral and agricultural land uses in their catchments. My understanding is that it is not the intensification of land use that is at issue in the Waiau catchment, however. Land intensification is significantly less in the Waiau catchment than elsewhere in the Region with much of the western part of the catchment (ie: the land along the true right bank of the river) and significant parts of the balance of the catchment being heavily forested mountainous areas. Rather, sedimentation in this catchment, as I understand it, is a consequence of the diversion of 95% of the River’s natural flow (being the pristine alpine water) to Doubtful Sound, pursuant to the MPS.

- 31 That reduction in total flow compromises the River’s ability to flush its channel and to dilute sediments. In addition, as noted above, the remaining flow is largely sourced from the more highly sedimented Mararoa River and therefore has much higher load than was the case prior to the MPS being implemented.

Slumping arising from Reduced Flow Levels

- 32 The managed flow regime through the MLC Structure is constrained with respect to the turbidity of Mararoa waters flowing into Lake Manapouri allowed under MPS resource consent¹² That is, the conditions of consent restrict the extent to which turbid waters from the Mararoa may back up into the Lake.

¹² See schedule of conditions attached to Resource Consent 96022

- 33 Compliance with that regime is achieved by discharging any highly sedimented Mararoa water direct to the lower Waiau. To that end, the final 1 km of the Mararoa River above the confluence has been channelled so that the River flow is directed at the MLC Structure gates. Thus the Mararoa River flow can, when necessary, be easily directed downstream by simply opening those Weir gates.
- 34 The Waiau River Liaison Committee conducted a video interview on 25 March 2018 with Sir Alan Mark (an original Guardian of the Lakes). Sir Alan advised that it has been estimated that the Mararoa River contributes around 33,000 tonnes of gravel and sediment annually¹³. That volume now is discharged directly into the lower Waiau but is no longer diluted by significant flows from the Waiau River above the MLC Structure.
- 35 My understanding is that once turbidity is below consented levels, the Weir gates are closed and immediately return the flow into the Waiau to the consented minimum. The consequence for the banks of the river downstream are dire. With a consistent high flow, the banks become saturated, but are supported by the high flow in the river. Once the gates at the Weir close, flow drops faster than the banks can drain. The consequence is that the banks collapse. The slumping of high banks on the Waiau is a common sight the length of the River.
- 36 Bank collapse contributes additional gravel and fine sediment to the River which in turn, has created a significant and observable build-up of gravel immediately below the Tuatapere Bridge and deposited fine sediments into the Te Wae Wae Lagoon. Overall, the essential character of the river has changed from being a single stem river to a braided river, with an extensive meander pattern, especially below Tuatapere.
- 37 The transport of sediment by the lower Waiau River has been significantly altered by the MPS structures and including the structures in the existing environment will perpetuate these environmental effects.

¹³ Estimate based on actual gravel extraction from the Mararoa delta immediately upstream of the MLC structure (prior to the alignment of the Mararoa River with the MLC structure)

Opportunity Cost of Allocation of Water to MPS

- 38 I understand that Objective B3 of the NPSFM requires Regional Councils to improve and maximise efficient allocation and use of water, including economic efficiency. Economic efficiency suggests allocating water to its highest value use. I consider that there are higher value uses for the water, than the MPS. The MPS consumes 16 billion cubic metres of freshwater annually¹⁴. The MPS represents 60% of NZ's total consumptive freshwater use¹⁵ and a simple calculation suggests that water consumed by the MPS generates a fraction of a cent¹⁶ in profit for each cubic meter of water consumed.
- 39 The aspirations of our community for the waters of the Waiau have never been considered. Certainly, so far as Aratiatia is concerned, the company could generate a far higher rate of return per cubic meter consumed than achieved by MEL, were, for example, the company able to source water for irrigation.
- 40 On the irrigation question, in evidence provided to the Hearing Panel on behalf of MEL¹⁷ Mr Brian Ellwood estimated that primary groundwater reserves were sufficient to irrigate 39,000ha within the Te Anau Basin (based on a demand of 300mm/ha/year applied). This would see MEL would forego between \$1m and \$1.7m per annum in generation. Similarly Mr Ellwood estimated the groundwater reserves below the Weir as being sufficient to irrigate approximately 13,000has at the same rates. Applying the same calculation to the 13,000ha of irrigable land below the Weir, that suggests that that land might be irrigated at a further cost to MEL of between \$0.33 and \$0.56M pa of generation foregone.
- 41 It is not clear from Mr Ellwood's evidence whether his estimates of generation foregone were gross revenue or net profit. I have not

¹⁴ *Update of water allocation data and estimate of actual water use of consented takes 2009–10*, Aqualinc for Ministry for the Environment 2010. More recent reports of this nature appear to exclude hydro-generation from the calculations on the basis that it is typically a non-consumptive use.

¹⁵ *Update of water allocation data and estimate of actual water use of consented takes 2009–10*, Aqualinc for Ministry for the Environment 2010.

¹⁶ MEL Annual Report 2017

¹⁷ Brian Ellwood, Lowe Environmental, Evidence to pSWLP Hearing Panel 2017. Page

investigated whether the area estimates (which total 52,000ha) are in fact irrigable. However, accepting Mr Ellwood's area estimates and treating the revenue foregone estimates as net profit at the upper limit then, in the event of the groundwater reserves to be allocated to irrigation, the cost to MEL's net profit may be as high as \$2.2M.

- 42 To put some context around that number however, I use the financial performance of Aratiatia in the 2017/18 financial year. During that year a medium scale adverse event was declared by the Minister of Primary Industries, in view of a period of exceptional dry weather from October 2017 to January 2018. The production foregone and additional feed purchased by Aratiatia in that year cost the business just over \$800,000. An ability to irrigate the Property would have avoided those losses. Assuming that irrigation across Mr Ellwood's 52,000ha could mitigate similar losses, the benefit to the Region (and the nation) could be around \$69M pa.
- 43 I understand that the next stage of the pSWLP process is limit setting. To that end the SRC intends to establish a Regional Forum as a form of community consultation and to advise Council on the limit setting process. My concern is that, should the MPS infrastructure and particularly the MLC Structure be included in the existing environment, the adverse environmental impacts of that structure cannot be considered. Instead my concern is that Aratiatia and the other businesses and communities on the Lower Waiau will be forced to absorb all the costs of any limit setting adjustments deemed necessary by the regulator.

Loss of Amenity

- 44 My family keenly feels the loss of amenity the operation of the MPS has caused.
- 45 During summers we routinely swim in the Waiau, fish for trout in the Waiau and used to net for flounder and have dug for toheroas¹⁸ at Bluecliffs Beach. The sediment load and presence of periphyton throughout the

¹⁸ We recognise that the harvesting of toheroas is now permitted only for Iwi as a customary right, but never the less the loss of habitat for this fishery should be a matter of concern to all.

lower Waiau now make swimming an unpleasant experience. The occasional presence of cyanobacteria means that we can never be assured of the safety of our swimming holes. Extensive algal blooms (didymo) make fishing difficult and Bluecliffs Beach over the lifetime of the MPS has been transformed from a sandy beach with sand dunes to a rock-strewn beach where floundering is not possible at all. I acknowledge that digging for toheroas is now restricted to Iwi as a customary right. Nevertheless the loss of sand and the collapse of the toheroa beds is an ecological loss.

46 It was a strangely moving, emotional experience when I travelled to Deep Cove in April 2018 and stood beside the MPS tail race tunnel as it disgorged the waters that would once have flowed down the lower Waiau. My sense of loss was palpable.

47 My lineage is European and although I have no Maori ancestry, I feel the loss of the mauri of the River. My feeling is best summed up by the Maori saying:

Ko au te awa, ko te awa ko au : I am the river and the river is me.

Ki te mate te awa, ka mate ano hoki tatou: If the river is dead, we will die too.

Remedies

48 I am concerned that the inclusion of the MPS structures as part of the existing environment will prevent the adverse economic, social, cultural and environmental consequences of that infrastructure being recognised as part of the consideration of future resource consenting processes.

49 My specific concern is with the MLC Structure. It is the operation of the MLC Structure which has caused significant adverse impacts on the ecology of the lower Waiau, to its receiving body, to the land owners adjacent to it, and to the wider community. Anecdotally, I understand that the structure's design is the reason that most eel migration can occur only with intervention and increasing the minimum consented flows into the lower Waiau when the level of Lake Manapouri is low would be challenging.

- 50 It is conceivable that the MLC Structure could be modified to mitigate these adverse consequences of its operation. Similarly, the operating regime of the MLC Structure which determines the shape of the hydrograph in the lower Waiau could be changed to minimise damage from erosion.
- 51 I consider that the regulator should retain an ability to determine whether to include or exclude the MPS structures in or form the existing environment during future resource consenting processes. The current wording of Objective 10 in the decision version of the pSWLP denies that possibly. I ask that the wording of Objective 10 revert to the form of words in Objective 10 in the Notified Version of the pSWLP. That wording would allow submitters to any future resource consenting process to be able to be fully engaged with that process. In that way the adverse consequences of the MPS could be properly assessed against any perceived benefits.

Dated this 15th day of February 2019

Paul Marshall