

**BEFORE THE COMMISSIONERS APPOINTED BY
THE OTAGO REGIONAL COUNCIL**

In the Matter of an application under
RM19.151

Between BSTGT Ltd and A P McQuilkin,
N J McQuilkin, K L Skeggs, S A
McQuilkin and G M Todd being
Trustees of the A P McQuilkin
Family Trust (**Applicant**)

Consent Application RM19.151

BRIEF OF EVIDENCE OF BERRI ANTONIUS SCHRODER

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BRIEF OF EVIDENCE OF BERRI ANTONIUS SCHRODER

Introduction

1. My full name is Berri Antonius Schroder. I am a business partner in investments with Bloomsbury Stud (NZ) Ltd, a submitter in respect of the application by the Applicant to take water from the New Chums and Royal Burn North Branch streams (**Application**).
2. I am also a director of My Farmer World Limited (MFW), a business initiative that started 18 years ago, that monitors farm performance and animals using APP technology and various sensors. The shareholders of MFW include Abron, Kiwi Fertiliser and Mainland Minerals. These companies, which have a combined client list of approximately 2600 farms, specialise in the conversion of petro-chemical fertiliser management systems to biological or regenerative farming practices. MFW also advises and supports farmers throughout a full conversion to organic farming. MFW relies heavily on data collection and management as it certifies and benchmarks the performance of the various fertiliser programs that are executed on each farm. As part of its program, it also specialises in the installation of on farm sensors, including weather stations, water monitors, soil probes and tank/ vat monitoring.
3. I hold an Associate Diploma of Agriculture specialising in soils and agronomy from Murdoch University (Muresk) in Western Australia. This qualification, and my experience described above, means I am qualified to make the comments below on water quality issues arising from irrigation of the golf course on the Applicant's property.
4. While I am involved in a submission in opposition to the Application, my evidence is partly expert in nature. To the extent that my evidence is expert in nature, I confirm that I have read the Environment Court Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2014. I confirm that I have endeavoured to comply with the Code when preparing this evidence. In particular, the matters in this evidence are within my knowledge and expertise and I have not omitted to consider any material matter that could influence my opinion.

Background

5. Although I reside primarily in the Waikato and Auckland, for part of the year I live at [REDACTED]. I have been aware of the golf course development owned by the Applicant but did not realise that it was to become an 18 hole golf course until recently. I have had the opportunity to walk all over the Applicant's property, including viewing all the water take positions, in particular the New Chum's Creek extraction point, as it is positioned on a public walk up to the old gold diggings. I have also managed to inspect the stock farmed on the property. As part of my discovery, I took a spade and dug a few holes.
6. Henrietta Duchess of Bedford, who is a major shareholder in Bloomsbury and who bought [REDACTED] some ten years ago, comes from Woburn Abbey, England, where her husband built three championship golf courses. The English Masters is played on one of the courses. I have some understanding of the various fertiliser and spray regime required on a high caliber golf course, which the Applicant's wishes to be.
7. I have read all the documentation supporting the Applicant's application and felt it necessary to comment.

The Environment

8. Crown Terrace is a large flat and fertile area that historically was well known for growing superior grain crops. It can be best described using the following earth profile¹.

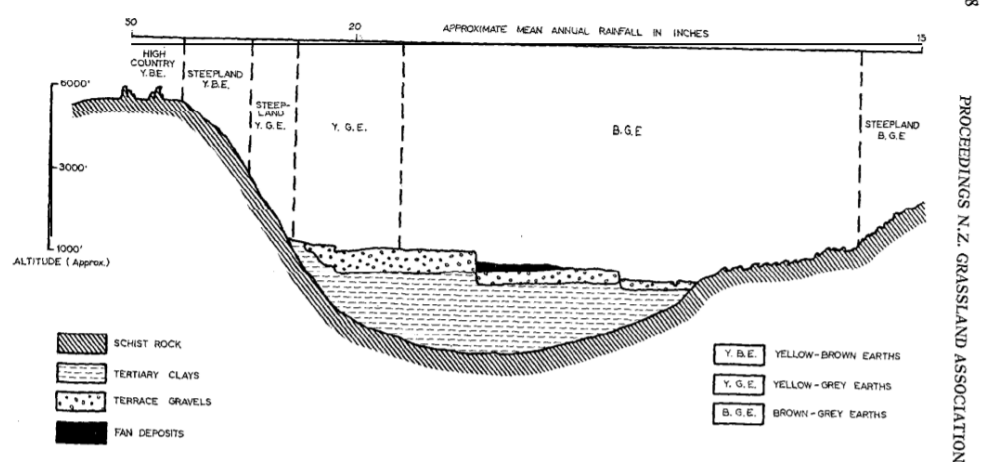


FIG. 1: Diagrammatic section across a typical segment of Central Otago showing geological structure, rainfall and soil sequences.

At approximately 600m of altitude, the Crown Terrace is characteristically subject to unpredictably hot dry summers and cold snowy winters. Although the median annual rainfall is stated to be 700-800mm, this is often not the case due to the unpredictability. The last two summers have been the wettest in recent history but prior to this many farmers were using their winter feed during the summer to feed their animals. The area is known for its prevailing westerlies, with extremely low levels of humidity. In winter, although it is cold with occasional snow, recently snow falls have been lower than normal. The air during winter is notoriously dry.

9. The Crown Terrace is predominantly Pallic Soils, and is also composed of Loess and Alluvium, and the surrounding lithology Schist. The floor consists of shist with a number of underground fissures collecting and directing rain water and snow melt. This is evident by the number of seep areas which produce water in the various swamp areas. At certain times of the year these produce very little water due to the dryness of the climate and reduced subterrain water volume.
10. Comprehensive soil testing has been carried out on properties neighboring the Applicant's property. Due to the historic type of fertiliser programs, the density and numbers of biological microbes (fungus and bacteria) present suggest that considerable restorative programs are required to ensure that a cyclical nitrogen and carbon regeneration is generated. Slightly elevated levels of Nitrogen have already been recorded in bore water samples in the area.
11. Holes dug on the Applicant's property would seem to support soil characteristics consistent with neighboring properties.

Concerns regarding water quality effects

12. Golf courses require considerable grass, weed, fungus and nematode remedial care if they are to be kept to a commercial standard. Most fairways and greens are addressed with consistent volumes of fertiliser to ensure a uniform playing surface. Different green grasses require different fertiliser programs. Weeds are generally sprayed with Glyphosate or Paraquat, although there is an increased desire to use biological products due to known soil and water contamination. Various fungicides are applied to the greens to prevent fungal spore proliferation which can spoil green runs and predictability and pesticides are applied to the green surfaces to

reduce the effect of worm casting and nematode scouring effect. There is a continuous grass grub issue in the area. It is widely accepted that runoff from golf courses can be among the most polluted of any environment. One only has to follow the contamination issues that have arisen at Lake Hayes to understand the potentially damaging effect golf courses can have.

13. Unfortunately, neither the Application nor the evidence for the Applicant contains any clear plans in respect of preventing pollution from run-off from the golf course. Nor is there any suggestion of monitoring requirements that could independently certify that best practice is being implemented, and is not resulting in pollution of the natural creek environments and the water systems that are prevalent in the sub-strata of the shist bedrock.
14. The data that I have seen is underwhelming in terms of correct monitoring to support the veracity and assurances that there is sufficient water and that the management systems deployed will not create long term environmental and living standard issues. As the soils do not contain enough resilience in terms of reliably holding onto water during the compromising weather patterns (due to insufficient humus and microbial activity), in my opinion accurate weather data is crucial to understanding what is possible in relation to water use and the management programs required to protect water quality. It is a fragile ecosystem.
15. It could be expected that to support the Applicant's proposed water extractions, the Applicant should have deployed a number of weather stations over a statistically acceptable number of years (in my view, at least seven would be appropriate) to accurately record what water is available and at which times. This should have been supported by a number of sensors that independently and reliably produce certifiable water volumes over time and not simply at certain times and dates, as has been submitted. Currently the data related to this seems to be arbitrary, and during a time period which has been anecdotally known to be one of the wettest summers in recent history.
16. Sensors should also be recording the volume of the various seeps. This would provide an understanding of what is happening to the water table below. This has also not been done.
17. There should also be specific sensors and catchment ponds, located in positions that would provide analysis of water quality coming from the

ground runoff and the water table below. There should be enough of these to ensure no contaminants are getting into the environment, as these issues may not be known until years later when it may well be too late to reverse the effect.

18. In my opinion, there should be a fully auditable and independently certifiable fertiliser and spray program submitted for acceptance prior to any water being used for golf course irrigation purposes. The proposed program should be agreed to by multiple environmental practitioners to ensure the veracity of the suggested programs. These certifiers should be independent and selected by the Council.
19. Although the locals have known about the golf course, the extent, size and type of course have only recently become evident. The Application states the water take is required for irrigation and stock use, without mentioning the golf course. In my mind, this appears to be purposefully misleading. The stock numbers observed on the Applicant's property would only use a very small percentage of the water applied for in the Application, and information subsequently provided by the Applicant supports this.
20. It would seem that at the very minimum a change of use for the land would need to be obtained because the current water application volumes bare no relationship to an agricultural use for this volume of water. There is not enough land area to sustain the number of stock units required (the regional area sustains approx. 3500 stock units for 450 ha with each stock unit consuming 3-12 liters per day) to utilize the volume of water the Applicant is seeking.
21. During a recent site visit, I observed numerous ground works taking place which had produced considerable runoff of silt. The nature of the soil is such that very fine silica particles in the soil become suspended in water, thereby having the effect of turning all waterways into a cloudy haze. This runoff material has not been controlled. The same can be said where some 11,000 cubic meters of fill was dumped further up the Applicant's property. The effect of this runoff can be seen in attached photographs.
22. Finally, I am concerned about the water take on New Chums Creek. At the water extraction point, approximately 95% of all the water is taken from the creek, and through approx. 350 meters of recently constructed pipes, is artificially redirected to the historic water race used by the goldminers in the

late 19th century. The out take and these pipes can be seen in the attached photographs.

23. New Chums Creek is an otherwise healthy environmentally active stream that runs down to the eastern side of the Arrow River. By redirecting all of this water, New Chums Creek has been relegated to a trickle and it has destroyed the natural creek environment.
24. The historic mining race way also acts as a gutter which also catches nearly 100% of a number of smaller tributaries which naturally would have flowed into the bottom of New Chums Creek and onwards into the Arrow River. These small tributaries are now bereft of any water and the small gullies that they ran through are devoid of any natural creek life with considerable erosion occurring.
25. I am satisfied that the evidence I give above on the management systems and data monitoring are applicable to the Barley Station situation.

Date:9th June ,2021

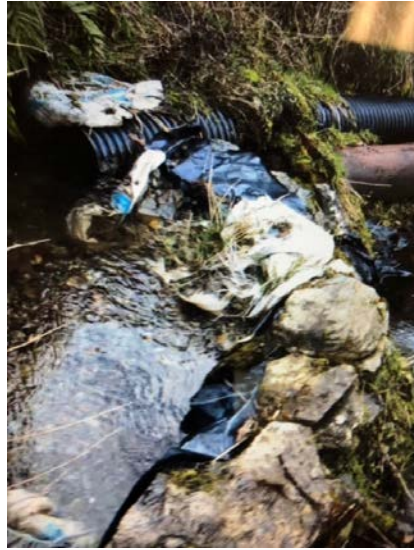
Berri Schroder

References

1. THE SOILS OF CENTRAL OTAGO M. L. LEAMY Pedologist, Soil Bureau, D.S.I.R. Alexandra



New Chums Creek Water Outtake



New Chums Creek Outtake



New Chums Creek Outtake Seepage (less than 5% through dam wall)



Newly Constructed Pipes



Pipes Continuing



Pipe extraction to the New Chums Historic Mining Raceway



Applicant's Property facing West with Queenstown in the Distance



Earth Works with silt wash in small stream



Earth works on escarpment facing North



Neighbours Pond full of silt



Close up of silt in pond



Close up of fine silica silt particles in stream