BEFORE THE COMMISSIONER APPOINTED BY
THE OTAGO REGIONAL COUNCIL

IN THE MATTER	of the Resource Management Act 1991 ("the Act")
AND	
IN THE MATTER	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 Consent Application RM19.151

STATEMENT OF HILARY LENNOX
EVIDENCE ON BEHALF OF 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

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INTRODUCTION

Qualifications and Evidence

1. My name is Hilary Lennox. I hold a Bachelor of Environmental Geoscience honours degree and a Masters of Applied Environmental Geology from Cardiff University. I have been working as a planning and environmental consultant for over 15 years, both in the private and the public sector.

2. I have worked on a wide range of resource management issues, including freshwater management, since I began working as a Consent Officer at the Otago Regional Council (ORC) back in 2009, and then as the Manager of the Consents Team at Environment Southland.

3. I have been employed as a Senior Consultant at Ahikā Consulting Limited for 2 years and previously worked at Landpro Limited, which is where I first began working for the applicants.

4. In my current role I manage several ecological restoration projects and have gained skills that supplement my existing knowledge and understanding of the natural environment, particularly in Otago.

5. I am a Certified Hearings Commissioner having completed the RMA Making Good Decisions Programme.

6. In addition to this preparing evidence, in this role I have:
   a. written and lodged the application to replace the applicants' permits to take water from the Royal Burn and New Chums Creek;
   b. attended the site on numerous occasions and accompanied hydrologists and freshwater ecologists during on-site surveys; and
   c. undertaken consultation and negotiations with affected parties.

7. I confirm that I have read and agree to comply with the Environment Court Practice Note 2014 with regard to Expert Witnesses. 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.

8. In preparing this evidence, I have read and had regard to the following:
   a. the evidence of Mr Hickey, the evidence of Mr Howard, and the evidence of Mr Olsen on behalf of the applicants;
   b. the reporting officer's s42A Report and other council officers' expert assessments and analysis;
   c. the submissions received; and
   d. the relevant planning instruments.

9. I have visited the intake site and walked sections of both creeks many times. I am familiar with how water is taken, stored and used on both properties owned by the applicants.

Scope of Evidence

10. The scope and structure of my evidence is as follows:
   a. The Proposal
   b. History of Amendments
   c. Effects on the Environment
   d. Effects on Other Users
   e. Efficiency of Use
   f. Value of Existing Investment
   g. Policy Assessment
   h. Consent Conditions
   i. Conclusion

THE PROPOSAL

11. The application seeks to replace Water Permit RM14.364.01 and Deemed Permits 3073B, 95696 (incl. WEX0184), 96285 and 97029_V1 to take water from the Royal Burn and New Chums Creek for the purpose of irrigation, domestic and stock water supply. There are two points of take on the northern branch of the Royal Burn (referred to hereon in as Upper RBNB and Lower RBNB) and one point of take on New Chums Creek.

12. Water taken for irrigation purposes is used on productive farmland, a private golf course and a 4 ha turf growing operation. It is also used to irrigate private gardens and recent plantings of native vegetation.

13. Further description of the proposal and the surrounding environment is provided in Ms King's s42A report and Mr McQuilkin's evidence.

14. In terms of the status of the proposed activity, I agree with Ms King's assessment that the application retains the activity status at the time of lodgement and is, therefore, a restricted discretionary activity under Rule 12.1.4.5 of the Regional Plan: Water for Otago (RPW).

HISTORY OF AMENDMENTS

15. The application was lodged with ORC on 13 May 2019 and has been amended significantly since then following the results of further investigations, consultation with ORC and affected parties, and evolution of the policy framework. These amendments are described below.

Rates Of Take

16. The rate of take originally applied for at the Lower RBNB was 100 L/s. This was reduced to 50 L/s following upgrades to the intake infrastructure including installation of a gated structure in the open channel, which provides greater control over the way in which water is taken.

17. The rate of take from New Chums Creek originally applied for was 45 L/s. Following ORC's assessment of historic use using Method 10A.4.1, which was notified as part of Plan Change 7 on 18 March 2020, the rate of take from New Chums Creek was reduced to 24.5 L/s. The rates of take now sought are summarised as follows:

Table 1: Rates of take sought compared to historic allocation

	Upper RBNB	**Lower RBNB**	**New Chums**	**TOTAL**
Historic allocation (L/s)	66.7	166.7	66.7	300.1
Allocation sought (L/s)	15	50	24.5	89.5

18. This equates to maximum daily rate of take of 7,732.8 m^3/day.

19. Overall, the rate of takes sought are less than 30% of the applicants' current paper allocation[1]. The rates of take have been assessed by ORC as being representative of, or less than, historic use[2].

Annual Volume

20. The annual volume of water originally sought (1,822,608 m^3/yr) was based on the irrigation demand for 175.2 ha of pasture modelled using Aqualinc 2017, plus 5 L/s baseflow in the races. This has been reduced to 1,214,683 m^3 based on the following:

[1]Note that the 'paper' primary allocation for the north branch of the Royal Burn is actually higher than this, with the additional allocation held by Glencoe Station Ltd. The submission from this party notes that this allocation has never been used, which means that it will be lost on 1 October 2021.

[2] ORC Section 42A Staff Recommending Report, Alexandra King, 25 May 2021

a. Further assessment of irrigation demands for the golf course revealed that it requires less water than pasture;
b. The baseflow component has been reconsidered; and
c. Recent changes in the policy framework and in the way that consents are processed mean that greater emphasis is placed on granting no more water annually then has been taken historically.

21. Further discussion regarding the efficiency of use is provided below.

Low Flow Cut-Off Condition

22. In August 2020, we were made aware of several parties downstream that could be adversely affected by the proposed abstraction activities. Taking te mana o te wai into account, and to provide certainty that the proposed abstraction activities will not adversely affect downstream users, the following consent condition was proposed:

> *Water must not be abstracted from the Royal Burn North Branch for irrigation purposes when flows in the Royal Burn drop below 5 L/s at NZTM2000 1274996E 5011547N.*

23. This is discussed further below.

Residual Flow for Ecological Purposes

24. The original application proposed a visible residual flow past each point of take. Following advice from ORC's Resource Science Unit, this was amended to include a connected visible flow immediately downstream of each point of take for a distance of no less than 50 m. This is discussed further below.

Consent Conditions

25. The original application proposed a suite of consent conditions. A revised set of conditions were provided on 3 March 2021. Further discussion on consent conditions is provided below.

EFFECTS ON THE ENVIRONMENT

Effects on Ecological Values

26. The application was originally reviewed by Pete Ravenscroft of ORC's Resource Science Unit in June 2019. Mr Ravenscroft's assessment[3], concludes that the effects of the proposal are no more than minor providing that all three points of take have to adhere to any future minimum flow on the Arrow River, and that water is not taken from any point of take when a connected visible flow immediately downstream for a distance of no less than 50 m cannot be maintained. The application was subsequently amended to include RSU's residual flow condition.

27. ORC identified the Department of Conservation (DOC) as an affected party to the proposal. The consultation that was undertaken with DOC is summarised as follows:

    a) ORC (Ross Dungey) had previously visited the site and was satisfied that there were no native fish present[4], as was Mr Ravenscroft. DOC noted that ORC's surveys had been limited and asked that we either undertake a more thorough survey or assume that native fish may be present.

    b) We then engaged Matt Hickey and Dean Olsen to undertake a more thorough survey with guidance from Daniel Jack from DOC to ensure that the survey was undertaken to DOC's satisfaction.

    c) The survey confirmed that there are no native fish present in either the North Branch of the Royal Burn or New Chums Creek.

    d) Several age classes of small trout were recorded downstream of the confluence with the South Branch. Mr Hickey's report states that given there is no fish passage from the Arrow River up the Crown Terrace to the Royal Burn, it indicates that fish have been liberated into the Royal Burn and that currently, the intermittent reach in the North Branch is acting as a barrier to trout moving into the fish-free reaches upstream. Mr Hickey's report states that it is

[3] RSU assessments of BTSGT Limited water take RM19.151 to take water from the Royal Burn and New Chum Creek, Pete Ravenscroft, 13 June 2019

[4] Fish survey commissioned by ORC

highly unlikely that this trout population is contributing to the wider Arrow fishery, nor are they of any size to be a recreational asset.

e) DOC were satisfied with the 50 m residual flow proposed by ORC and were also satisfied that there is no need to install fish screens. In April 2020, DOC provided unconditional written approval.

28. There are no Regionally Significant Wetlands or any know regionally significant wetland values that will be affected by the proposal. This is confirmed in Ms King's s42A report (Ms King later goes on to state that Ms Miller's recommended flow regime will protect the wetland swamp habitat, even though there isn't any).

29. Ms King's Notification Assessment[5] concluded that effects on fish and instream ecology are no more than minor. However, in her s42A report, Ms King states, "*Although the Applicant has aligned themselves with Council's original Resource Science Unit (RSU) report by Mr Ravenscroft, more information has been provided by the submitters and Applicant which has provided Council cause to reconsider these recommendations*".

30. I am unsure what information Ms King is referring to, as no new ecological values or effects on existing ecological values were identified since Ms King's Notification Assessment was written in November 2020 (the results of the fish survey were submitted earlier in 2020). I am unaware of any information submitted that would make Ms King reconsider her assessment that, "*effects on fish and instream ecology are no more than minor*". Nonetheless, Ms King engaged Bryony Miller of E3 Scientific to provide an additional review of our proposal because Pete Ravenscroft was unavailable.

31. I have identified a number of errors in Ms Miller's evidence, some of which are discussed below. I have concerns that Ms Miller's recommendations are based on her misunderstanding some of the information that she has viewed, and that she has not viewed all of the information that has been provided to ORC.

32. At paragraphs 8, 16 and 26, Ms Miller relies on information about the local environment provided by submitters, but also notes that these are

[5] Notification Assessment, Alexandra King, 13 November 2020

"*general observations"*. I would urge caution to be exercised when relying on these submissions for this purpose for the following reasons:

- The submission from Glenn and Kerryn Russell refer to Brodie Creek, which is non-existent. I believe that they must be referring to Brodie Race, which is a man-made race. Ms Miller has then asserted that the subsequent comment regarding the creek running dry is referring to the Royal Burn, but to me it's clear that the submitter was still talking about 'Brodie Creek'. If the submitter has observed Brodie Race running drier than usual then that is a sign that the applicant is learning to use water more efficiently.
- The submission from Bloomsbury Stud (NZ) Ltd refers to effects that may have been experienced while construction was occurring upstream. I cannot comment on whether this actually happened but nonetheless, the effects were short-term and not necessarily representative of what is typically experienced as a result of the applicants' abstraction activities. I, therefore, disagree with Ms Miller's assertion that, "*This statement questions the sustainable management of the current water abstraction by the applicants*".
- Mr Hodges' statement that, "*the whole creek has dried up at times"* is inconsistent with other submissions and the LOFTS Water Ltd application for a Certificate of Compliance[6], which state that even when the Royal Burn is dry at Glencoe Road, there is still plenty of water at the LOFTS Water Ltd point of take.

33. Under Ms Miller's recommended residual flow regime, during low flow periods, 9.6 L/s would pass the upper point of take on the North Branch of the Royal Burn, only half of this would pass the lower point of take. Due to the losing nature of the creek downstream of this location, this flow (<5 L/s) would quickly be lost to ground. Ms Miller's residual flow regime would, therefore, provide for flow between the two points of take only. During very dry periods, such as those experienced in January 2018, even this level of connectivity would not be achievable due to the increased extent of the losing reach experienced under these conditions.

34. The objective of Ms Miller's proposed residual flow regime is, "*to maintain water quality parameters and flow that will allow for*

[6] Application for Resource Consent (Certificate of Compliance), LOFTS Water Ltd, 27 September 2020

EPT taxa and trout to persist in these streams[7]'. Ms Miller has not explained why she believes that RSU's residual flow recommendations would not allow for EPT taxa (or trout) to persist in these streams.

35. Neither Mr Dungey, Mr Ravenscroft, Mr Hickey nor Dr Olsen identified any threatened invertebrates within New Chums Creek or the North Branch of the Royal Burn. RSU's assessment of the application took into account the presence of EPT taxa in the affected creeks. Ms Miller has not shown there to be any other significant ecological values that need to be taken into account. I am, therefore, unsure why Ms Miller's recommendations are so different from RSU's.

36. Furthermore, the evidence from Dr Olsen concludes states that, "*Based on my observations of the North Branch of the Royal Burn and New Chums Gully and the ecological values they support, it is my opinion that the proposed residual flow conditions will provide for the life supporting capacity of these systems*". Dr Olsen is referring to RSU's recommended residual flow regime here, not Ms Miller's.

37. If the applicants were to adopt Ms Miller's residual flow regime, they would be subject to longer periods where water cannot be abstracted other than in accordance with the permitted activity criteria of <1 L/s and 25,000 L/d. I am not confident that the existing infrastructure would be able to convey sufficient water to the stock that need it for an extended period. Under RSU's residual flow regime, this is less of a concern.

38. In summary, there is no evidence to suggest that Ms Miller's recommended residual flow regime would provide for greater protection of the natural ecological values[8] of the subject creeks compared to RSU's recommended residual flow regime.

39. Several times throughout her evidence, Ms Miller states that insufficient evidence has been provided to demonstrate the presence of a naturally intermittent reach of the North Branch of the Royal Burn. However, Ms Miller clearly hasn't been given all of the evidence that we've provided to ORC because it's not all listed in paragraph 7 of her evidence. This

[7] Paragraph 49 of Ms Miller's evidence
[8] Paragraph 52 of Ms Miller's evidence

includes flow gauging data from 2018, the evidence from Matt Hickey that was sent to ORC in advance, emails that I sent to ORC explaining the more recent flow gauging data, or the sample of photos/videos that I sent to ORC. We have photos/videos taken nearly every week from November 2020 to March 2021 showing the effect of the losing and gaining reaches. I have offered there to ORC on several occasions but they have not wanted them, and so I am providing them now along with this evidence. I am, therefore, disappointed that Ms Miller believes there to be insufficient evidence to support our observations of the gaining and losing nature of the North Branch and main stem of the Royal Burn.

40. At paragraphs 38 and 51, Ms Miller recommends that the low flow cut-off be increased from 5 L/s to 10 L/s. Please note that we proposed the low flow cut-off for the purpose of minimising potential adverse effects on downstream users, and not for the purpose of protecting instream values. Furhter protection of instream values was considered unnecessary due to the perennial nature of the stream downstream of this point.

41. I note that Ms Miller has misinterpreted the gauging data and made her recommendation based on an error.

42. Ms Miller has stated, *"If flows as little as 5 L/s occur at this point below the confluence with the Royal Burn South branch and groundwater upwelling area <u>where gauging in February found a gain of 31.9 L/s and a total flow of 44.3 L/s</u>, then there will be adverse ecological effects occurring upstream of this location…" (my underlining).*

43. The underlined statement is incorrect. The 44.3L/s that Ms Miller cites was recorded at a different location, some 380 m downstream at the Crown Range Road. This is shown on Figure 1 below, which is taken from Mr Hickey's evidence, with the proposed low flow cut-off monitoring location added for reference.

Figure 1: Gauged flows by NIWA on the 22nd of February 2021. Red dots are gauging locations and the respective flow at that point.

44. The applicants are not, therefore, proposing to apply the 5L/s low cut off below the groundwater upwelling area. The proposed monitoring location is within the groundwater upwelling area and there is a lot more upwelling occurring downstream of this location.

45. I would urge caution in relying on Ms Miller's recommendation given that it is based on her misinterpretation of the gauging data. Nonetheless, it is worth exploring her assertion.

46. The proposed 5 L/s low flow cut-off monitoring location is located at the bottom of the piggery paddock. According to Ms Miller, if flows as little as 5 L/s occur at this location then there will be adverse ecological effects occurring upstream including the potential for stagnancy in the wetted area and reductions in water quality required to support

ecological values such as dissolved oxygen and changes to water temperature, as well as increased stretches of creek intermittency.

47. During a phone call on 14 May 2021, Ms Miller advised that she had been unable to locate the wetted area in the piggery paddock (aka the 'swamp'[9]) during her site visit the day before. Ms Miller has not, therefore, seen the area in question. I do not, therefore, understand how she came to the conclusion that adverse ecological effects will occur in this area if flows of 5 L/s occur at the proposed low flow cut-off monitoring location.

48. Furthermore, Dr Olsen (who has visited the site) states the following in his evidence:

…I consider that an increase in the residual flows for the takes from the North Branch of the Royal Burn from 5 l/s to 10 l/s is unlikely to be of any material benefit to macroinvertebrate communities in the Royal Burn.

49. Other corrections to Ms Miller's evidence include:

- Paragraph 14. The rates of abstraction have been amended twice since the application was lodged.
- Paragraph 15. The PDP report that was prepared prior to some of the amendments to the application, and so it is now somewhat out of date. Also there is a maximum daily rate of abstraction - it's 7,732.8 m^3/d.
- Paragraph 15. Ms Millerstates that the proposal, "*does not provide for the future sustainable management of these abstractions*". However, she does not explain exactly what she means by "*sustainable management of these abstractions*", or why her proposed residual flow regime meets this objective and RSU's doesn't.
- Paragraph 17. The applicants can't maintain their abstraction rates during periods of low flow because there isn't enough water in the creek.

[9] Note that the term "swamp" is used casually to describe a damp patch in the piggery paddock dominated by willow, exotic pasture, bull rushes and other weeds, but is not a swamp as ecologically defined.

- Paragraphs 18 & 21. The applicants are not proposing to alter the creek's flow regime from permanent to intermittent, because it's already naturally intermittent.
- Paragraph 19. According to the operative RPW, the Arrow River is not overallocated.
- Paragraph 14. The 13.2L/s was derived assuming that all flows in the SBRB were maintained.
    - 12.4L/s (RB @ 'swamp') - 8.8L/s (RBSB contribution) = 3.6L/s is what's left of the RBNB at the 'swamp'
    - 16.8L/s (lower PoT) - 3.6L/s (what's left at the 'swamp') = losses of 13.2L/s
- Paragraph 32. The applicant's position has changed from that quoted, and we are now proposing a residual flow for New Chums Creek.
- Paragraph 48. Flows were gauged upstream and downstream of each point of take, and so the take is determined by subtracting one from the other.

50. In conclusion, Ms Miller has not provided any evidence that shows there to be significant ecological values present that were not already taken into account by RSU, Mr Hickey or Dr Olsen in their recommendations for a suitable residual flow regime. Ms Miller's recommendation to increase the low flow cut-off from 5 L/s to 10 L/s is based on an error in her interpretation of the flow data. Ms Miller has not explained why RSU's residual flow regime and/or the 5 L/s low flow cut off would not allow for EPT taxa to persist in these streams.

51. The only advantage I can see to Ms Miller's proposed residual flow regime is that is satisfies Aukaha Ltd preferemce for minimum/residual flows that are 90% of MALF. This is based on the Proposed National Environmental Standard on Ecological Flows and Water Levels, 2008. The appropriateness of this approach is discussed in Mr Hickey's evidence.

Effects on Groundwater

52. In her evidence, Hilary Lough has notes that no monitoring for groundwater effects have been proposed, and goes on to state that it would be difficult to isolate the effects of the scheme in groundwater monitoring data. Despite this, Ms Lough has suggested that the

applicant should monitor groundwater levels in bore number F41/0176 and supply this data to ORC annually.

53. I consider the monitoring proposed by Ms Lough to be impractical and pointless. Water Permit 97184.V1 authorises the abstraction of 36,000 L/d for the purpose of communal supply from bore number F41/0176. The applicants are the holders of only a 1/12th share of this permit and use the water for domestic use. At the time of writing this evidence, I had not investigated how the other shareholder uses their 11/12th share of this water permit, but I understand from conversations with the applicants that the intention is to replace this permit when it expires in 2022.

54. Groundwater level monitoring from a bore that is used for groundwater abstraction can be problematic because the abstraction activity will affect water levels in the bore. Ms Lough has proposed daily measurements of groundwater levels, but hasn't identified how changes in groundwater levels due to the applicants' upstream surface water takes would be discernible from changes in groundwater level resulting from abstraction directly from the bore itself.

55. Add to this the complex surface-groundwater interactions that exist in the area, and it seems that it would be impossible to isolate effects on groundwater levels in this bore resulting from the applicants' upstream surface water takes using Ms Lough's recommended monitoring regime.

56. Even if these effects could be isolated, Ms Lough has not provided any indication of what ORC's Compliance Team should do with the data collected, what degree of impact would warrant investigation or remediation, or what that remediation might look like.

57. Ms Lough has stated "*specific mitigation is not required at this time*" and that "*the updated proposal is to reduce the magnitude of take to historic use, so the effects are not expected to increase*". Ms Lough has also stated that it would be difficult to isolate the effects of the scheme in groundwater monitoring data. The groundwater monitoring proposed seems, therefore, to be a pointless exercise and a waste of time, energy and resources.

Effects on Water Quality

58. A number of submitters, namely LOFTS Water Ltd users, have raised concerns regarding water quality. ORC's response has been to recommend a consent condition that requires the consent holder to submit a fertiliser and nitrogen application report each year.

59. The following statements taken from Dr Olsen's evidence indicate that water quality in the Royal Burn is not being impacted by nutrient enrichment to any discernible degree:

The abundance of mayflies and stoneflies observed in the North Branch of the Royal Burn indicated good water quality and habitat and is consistent with the lack of fish.

Water quality in the lower Arrow River indicates a low level of nutrient enrichment and periphyton monitoring in the lower Arrow River indicates that periphyton proliferations would be rare, reflecting negligible nutrient enrichment.

60. This is supported by a comment made in the LOFTS Water Ltd application for a Certificate of Compliance:

There are 9 residential properties that benefit immensely from having reliable clean water delivered to their residence.

61. I note that in 2016, ORC granted Discharge Permit RM16.035.01 for the discharge of 1,155 L/day of human wastewater at a location that is 15 m from the Royal Burn[10] and in the vicinity of the LOFTS Water Ltd point of take[11] (Figure 2). The s42A recommending report for this consent states that there are no neighbours, downstream water users or instream values that may be adversely affected by the discharge. I suspect that the LOFTS Water Ltd activity was overlooked because they have only recently obtained a Certificate of Compliance (i.e. after RM16.035.01 was granted).

[10] ORC Staff Recommending Report RM16.035.01, Charles Horrell, 7 March 2016

[11] Royal Burn water take investigation re RM19.151.01 Water Permit application, Byron Pretorius, 22 Ocotber 2022

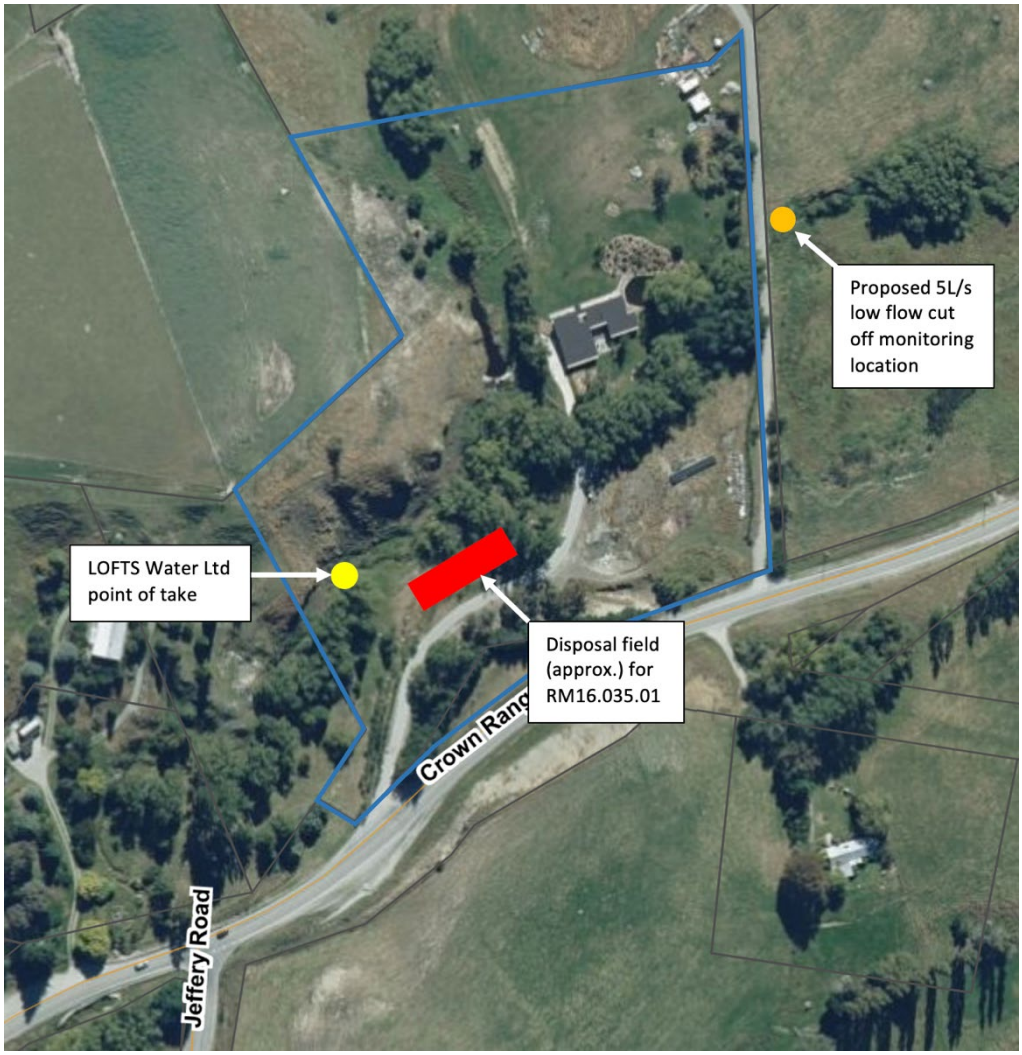

Figure 2;Location of RM16.035.01 in relation to the LOFTS Water Ltd of take (the proposed 5L/s low flow cut-off monitoring location is also shown for reference)

62. I do not know if this consent is currently being exercised, but given that there doesn't seem to be any significant water quality issues upstream, then perhaps this could be a more likely source of any localised effects on the LOFTS Water Ltd users than diffuse nutrient loading from irrigation activities higher in the catchment.

63. In summary, there is no evidence to demonstrate that water quality in the Royal Burn is being adversely affected by nutrient run-off from the applicants' properties. Furthermore, this condition does not provide ORC's Compliance Team with any indication of what to do with the reports, or any action that must to be taken. This condition does not seek to address any potential or known adverse effects. Submission of these reports, therefore, would appear to be a pointless exercise.

Effects on Iwi Values

64. Aukaha Ltd have expressed a preference for a residual flow and allocation regime consistent with the Proposed National Environmental Standard on Ecological Flows and Water Levels, 2008. The appropriateness of this approach is discussed in Mr Hickey's evidence.

EFFECTS ON OTHER USERS

Effects on Groundwater Users

65. Ms King's second Notification Assessment[12] identified a number of groundwater users that may be affected by the proposal. Only one of these groundwater users made a submission.

66. Mr Desbecker and Ms Bodle are the owners of bore number F41/0249, which is located near Jeffrey Road, approximately 180 m from the Royal Burn and around 500 m downgradient of the applicant's property, as shown in Figure 3 below.

Figure 3: Location of Bore Number F41/0249 in relation to boundary of BSTGT Ltd property boundary

67. A search of the ORC Open Data Platform shows that consent RM11.144.01 was obtained to authorise the construction of this bore. This consent expired in May 2013 and so it is assumed that the bore has been operational for around 8 years.

68. The recommending report for RM11.144.01 states that the applicant sought to drill a 55 m-deep bore to take up to 30 m^3/day for domestic supply. However, the submission from Mr Desbecker and Ms Bodle states that the bore is only 9 m deep. Furthermore, there is no water permit associated with bore number F41/0249 and so it is assumed that

[12] Notification Assessment, Alexandra King, 13 November 2020

if water is abstracted from this bore, it is taken in accordance with Permitted Activity Rule 12.2.2.1 (25 m^3/day limit).

69. The Desbecker/Bodle submission raises the question of whether the proposal will cause the bore to run dry, but does not mention whether there has been any impact from the applicants' activities on the availability of water from this bore to date. This is important information given that the proposal is to reduce the take compared with historical use.

70. As explained in a report by Pattle Delamore Partners (PDP) commissioned by ORC[13], reiterated in the evidence of Hilary Lough, and observed on many occasions during the monitoring undertaken as part of this consent application, there is a high degree of surface-groundwater interaction as the Royal Burn flows down from the Crown Range and across the Crown Terrace.

71. According to PDP, most of the Crown Terrace is overlain by a relatively thick aquifer comprised of gravelly alluvium/fan deposits that are probably thicker (>85 m deep in places) towards the Crown Range and thinner (pinching out to 0 m deep) towards the terrace edge. This helps to explain the losing and gaining reaches that have been observed.

72. PDP notes that bore number F41/0249 may have limited sustainability and rely on natural surface losses from the Royal Burn. However, the bore is located nearer the observed gaining reach rather than the losing reach, indicating upward movement of groundwater in this area (potentially as a result of the thinning aquifer).

73. Due to these complex surface-groundwater interactions, other sources of replenishment (e.g. other creeks and springs), the distance of this bore from the applicants' abstraction activities (over 1.5 km), and many other uses of surface and groundwater across the terrace that will have a cumulative impact on water resources, it is not possible to discern exactly what impact the applicants' abstraction activities might have on water levels in bore number F41/0249. If there are adverse effects on that bore, these effects should already be apparent.

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[13] Pattle Delamore Partners Ltd, Review of Royal Burn North Branch and New Chums Gully abstraction, 8 September 2020

74. In her evidence, Ms Lough states:

- *Effects on bores near the edge of the terrace may be limited due to groundwater inflows.*
- *The updated proposal is to reduce the magnitude of take to historic use, so the effects are not expected to increase.*
- *The location of bore F41/0249 near the terrace edge means that it is less likely to be adversely affected due to the expected gains in flow in the Royal Burn, reflecting higher groundwater levels in that location.*

75. In conclusion regarding potential adverse effects on bore number F41/0249, any adverse effects on the availability of water in this bore number are likely to be indiscernible. However, the proposed low flow condition, residual flow conditions, and reduced instantaneous and annual rates of take should provide the owners of bore number F41/0249 with certainty that any effects from the applicants' abstraction activities will be less than what might have been experienced over the past 8 years.

Effects on Deemed Permit 97402

76. Deemed Permit 97402 expires on 1 October 2021 and the permit holders (Baker et al.) have applied to replace this with a new water permit (Consent Application RM20.033). The application states that the modelled MALF of the Royal Burn at the point of take is 25.8 L/s. This is more than double the modelled MALF at the Lower RBNB point of take (10.7 L/s), which is indicative of the gaining nature of the Royal Burn as it flows across, and down from, the Crown Terrace.

77. According to a memo from ORC's Sean Leslie for RM20.033[14], the rate of take under Deemed Permit 97402 has been a maximum of ~28 L/s and an average of ~5 L/s. The annual volumes taken historically are shown in Table 3 below.

78. Baker et al. have applied for a permit with an instantaneous rate of take of 25 L/s and an annual volume of 310,117 m^3/yr, which is almost twice as much as the maximum annual volume taken historically. A take at that rate does not form part of the existing environment. In my opinion it is unlikely that the annual volume sought will be granted based on the

[14] RM20.033 - Historic Use Analysis, Sean Leslie, 17 March 2020

current policy framework (particularly Policy 6.4.2A of the RPW). The following assessment of potential adverse effects on Baker et al. therefore assumes that RM20.033 will be granted with rates similar to what has actually been taken in the past.

79. I have searched the application to replace Deemed Permit 97402[15] for evidence of what impact the applicants' activities might have had on Baker at al. in the past. The only evidence found in the application to replace Deemed Permit 97402 is as follows:

> *The [Baker at al.] rate of take was significantly lower in the spring/summer of 2016/2017 due to abstraction higher in the Royal Burn.*

80. There is no explanation of whether it is the applicants' (BSTGT Ltd/McQuilkin) abstraction activities that are being referred to here. Given that BSTGT Ltd/McQuilkin's annual abstraction in that year was only 60% of what it was in 2017/18 and 2018/19, it seems unlikely that it was the sole cause of the reduced annual abstraction by Baker et al. in 2016/17, otherwise we may expect even less water to have been available for Baker at al. in 2017/18 and 2018/19.

81. To illustrate this more clearly, I have produced the table below to show the annual take by BSTGT Ltd/McQuilkin from the North Branch of the Royal Burn, alongside the annual rate of take by Baker et al. from the main branch of the Royal Burn over the past 5 years. This table shows that there is no pattern to suggest that the annual volume taken by the BSTGT Ltd/McQuilkin has had any discernible influence on the annual volume taken by Baker et al.

Table 2. Annual volumes taken by BSTGT Ltd/McQuilkin from the North Branch of the Royal Burn and Baker et al. from the Royal Burn over the past 5 years.

	BSTGT/McQuilkin (m^3/yr)	**Baker et al. (m^3/yr)**
2015/2016	501,506	174,310
2016/2017	459,116	105,807
2017/2018	640,070	136,792
2018/2019	656,245	119,176
2019/2020	254,570	4,822

[15] Resource Consent Application to Otago Regional Council, Landpro Ltd, 5 February 2020

82. Submissions from the holders of Deemed Permit 97402 refer to reduced flows in the Royal Burn in recent years resulting from the applicants' activities. Without further analysis of rainfall, stream flow and all users water use data it is difficult to substantiate these claims.

83. Conversely, the application to replace Deemed Permit 97402 states that the ability of Baker et al. to take water in recent years has been severely impacted by damage to a pipeline that used to traverse SH6, and design flaws that limit the number of properties that can be serviced at any one time[16]. I would suggest that these factors may have had a far great impact on Baker et al.'s ability to take water than any activities upstream.

84. In conclusion, any adverse effects of the proposal on the availability of water for Baker et al. are likely to be indiscernible. In addition, the proposed low flow condition, residual flow conditions and reduced instantaneous and annual rates of take mean that any adverse effects will be less than those which may been experienced in the past.

Effects on LOFTS Water Ltd and other PA takes

85. In August 2020 we were made aware of several other parties downstream that could be adversely affected by the proposal. Effects on those parties who have submitted on the application must be considered. These are:

- Peter Clarke - the Royal Burn runs through their property and is used as stock water supply.
- Jef Desbecker/Robina Bodle, James and Lyn Campbell, Dinah Eastwood/Angus Sutherland, Patrick and Lisa Garceau, Bridget Wolter, Mylore Family Trust, Bloomsbury Stud, Glen Russell, Mark Weldon - all being landowners supplied with surface water from LOFTS Water Ltd. Some of these parties also have bores on their properties and/or allow their stock to drink from the Royal Burn.

86. LOFTS Water Ltd have subsequently obtained a Certificate of Compliance (RM20.330) to recognise their abstraction as a permitted activity under Rule 12.1.2.1. According to Certificate of Compliance RM20.330, LOFTS Water Ltd take water at a rate not exceeding 0.2684

[16]Sections 1.2 and 1.3, Resource Consent Application to Otago Regional Council, Landpro Ltd, 5 February 2020

L/s or just over 23,000 L/d. In theory, as long as there is always more than 0.2684 L/s in the Royal Burn, then there shouldn't be any issues regarding availability for LOFTS Water Ltd.

87. The location of the point of take for LOFTS Water Ltd is unclear. Certificate of Compliance RM20.330 states that the point of take is located at NZTM2000 E1274700 N5011100, which is approximately 100 m southwest of the intersection of Crown Range Road and Jefferey Road. However, a memo from ORC's Byron Pretorius, Team Leader Compliance Central, dated 28 July 2020, states that the point of take is located at NZTM2000 E1274850 N5011427, which is 150 m north-northeast of the intersection of Crown Range Road and Jefferey Road, as shown in Figure 4 below.

Figure 4: Different points of take mapped for LOFTS Water Ltd

88. Given the description of the intake infrastructure provided in Mr Pretorius' memo, I have assumed that the point of take is that described by Mr Pretorius.

89. Given the location of the restrictor valves described in the application for Certificate of Compliance RM20.330, it is still not clear how LOFTS Water Ltd are ensuring that no more than 25,000 L/d is abstracted from the Royal Burn.

90. Furthermore, the submission from Mylore Family Trust states that water supplied by LOFTS Water Ltd is used for washing down a deer shed after velveting stags, which is a commercial activity and not a domestic or stock drinking water use. Aerial photography shows a swimming pool at the property of Mr Weldon, and the water source for that is not apparent to me. However, these are issues for ORC's Compliance Team, and for the purpose of this assessment I have assumed that the take by LOFTS Water Ltd is lawful.

91. Due to gaps in our understanding of the hydrological regime of the Royal Burn, we initially found it difficult to quantify how LOFTS Water Ltd and other permitted activity takes might be affected by the proposal. As a result, from November 2020 until March 2021 we undertook further catchment study work in the form of weekly photographic and video monitoring and confirmed our observations with flow gauging.

92. As discussed in the attached report from Mr Hickey, our monitoring work has shown losses to ground between the Lower RBNB point of take and the 'swamp', but significant gains between the 'swamp' and the Crown Range Road crossing.

93. Observations indicate that even when the Royal Burn North Branch is dry at Glencoe Road, there is still plenty of flow downstream for LOFTS Water Ltd and the other permitted activity takes. This is consistent with comment made in the submission from Jef Desbecker:

In the very dry summer months, when the creek runs low or is dry in the vicinity of Glencoe Rd, the creek is naturally fed by swamps and seeps west of Glencoe Rd which bring the Royal Burn back to a modest flow.

94. And in the following statements made by LOFTS Water Ltd in the application for Certificate of Compliance RM20.330[17]:

Historically, neither the North nor South branch of the Royal Burn Creek ever ran dry naturally, even at the driest times of the year (source: residents of 30+ years). Consequently, the Royal Burn Creek at our point of take always has substantial flow.

The LOFTS take does not cause the Royal Burn Creek to dry up during summer nor does it ever dry up below the take.

95. This is shown in the photos and videos taken by Mr McQuilkin on 25 February, 28 February and 3 March, where the flow level at the staff gauge near the Crown Range Road remained consistent even when there was no/very little flow in the North Branch of the Royal Burn at Glencoe Road.

96. The presence of trout in the Royal Burn is further indication that the creek flows permanently downstream of the 'swamp'.

97. However, to provide absolute certainty that the proposal will not adversely affect downstream users, a low flow cut-off consent condition has been proposed. The low flow condition means that the applicants cannot take water from the North Branch of the Royal Burn for irrigation purposes when the Royal Burn drops below 5 L/s at the proposed monitoring location. This will ensure that there will be no effects from the proposal on the availability of water for LOFTS Water Ltd or the other permitted activities.

98. The proposed low flow monitoring location has been selected because it is downstream of the observed losing reach and because a notched weir can be more easily placed, monitored and maintained on the fence line.

99. Ms King identified several other activities that could be also affected by the proposal. These are: an abstraction to fill an ornamental pond (Patrick and Lisa Garceau); a proposed abstraction to supply a water wheel[18] (James and Lynn Campbell); and an intermittent pump-driven abstraction to service one dwelling (Jef Desbecker and Robine Bodle). None of these parties raised concerns about effects on these activities

[17] Application for Resource Consent, LOFTS Water Ltd, 27 September 2020
[18] It is unclear what purpose the water wheel serves,

specifically in their submissions. I do not understand how some of these activities meet the permitted activity criteria daily limit, however, I have assumed that they are all lawful. The proposed low flow condition means that the proposal will not adversely affect these activities.

100. My conclusions are supported by the evidence of Bas Veendrick, which states, "*with the proposed residual flow condition of 5 L/s… I am satisfied that the water quantity effects of the take on downstream surface water users will be less than minor, in terms of flow availability…".* Note that it is assumed that Mr Veendrick meant "low flow cut-off" and not "residual flow".

101. Mr Veendrick then goes on to say that this comment is made on the basis that the abstraction for domestic and stock water is small/negligible. I note that there is no take of water for domestic use proposed as part of this application and any that stock water abstraction occurring when the low flow cut-off has been reached will be in accordance with permitted activity provisions (no more than 1 L/s and 25,000 L/day). I also note that Mr Veendrick makes several references to a wetland that does not exist.

102. It is worth noting that Hereaway Trust Ltd have also recently applied for the Certificate of Compliance (RM20.388) to take water from the Royal Burn. However, this party did not make a submission and so effects on them have not been considered specifically. Nonetheless, the proposed low flow condition means that the proposal will not adversely affect this activity.

EFFICIENCY OF USE

Infrastructure

103. As noted in Ms King's s42A report, the applicants utilise efficient irrigation infrastructure that includes K-line, four travelling hoses and a network of pop-up sprinklers).

104. As noted in the evidence from Mr McQuilkin, the applicants have invested in onsite storage to ensure efficient use of water and to reduce pressure on the creeks during drier periods. This storage comprises a number of ponds that are either well established or under-construction:
    - Royal Burn Pond (13,000 m^3, established)
    - McQuilkin Pond (400 m^3, established)
    - New Chums Pond (7,500 m^3, nearly completed)
    - Brodie Pond (5,000 m^3, construction is well underway)

105. Mr Veendrick has asserted that 25,500 m^3 is less than 4 days storage based on a max daily rate of 7,732.8 m^3. However, Mr Veendrick has confused the maximum rate of take as being the maximum rate at which water will be used, which are not necessarily the same. It is the rate at which water is used that will determine how many days storage are provided on average, and this will vary throughout the year.

106. The value of existing investment is discussed below.

Historic Use

107. Water use data collected over the past 5 years indicates that the maximum annual volume taken in any one year was 1,214,683.04 m^3.

Table 3: Annual volumes recorded by BSTGT's water meters

	Upper RBNB (m^3/yr)	**Lower RBNB (m^3/yr)**	**New Chums (m^3/yr)**	**TOTAL (m^3/yr)**
2015/2016	13,517.3	487,988.98	190,920.12	692,426.4
2016/2017	93,003.9	366,112.76	242,362.7	701,479.36
2017/2018	159,712.7	480,357.3	239,532.92	879,602.92
2018/2019	278,581.8	377,662.7	558,438.54	1,214,683.04
2019/2020	146,055.8	108,514.68	533,907.55	788,478.03

108. It should be noted that data from the water meter associated with Deemed Permit 3073B is not included in Table 2 because this meter records the volume of water taken from the reticulated network rather than what is taken from the North Branch of the Royal Burn. Including

this data would, therefore, be 'double accounting' and would wrongly inflate the record of how much water has been taken historically.

109. We have extracted data from the irrigation system servicing the golf course and found that the maximum volume used for irrigating the golf course over the past 6 years was 1,949.43 m^3/ha. The golf course occupies 36 ha, of which only 20 ha is irrigated (the rough and bunkers are not irrigated). Based on this, the maximum annual irrigation demand for the golf course should be around 38,989 m^3/yr. If this land had remained in pasture then the average annual irrigation demand would be seven times greater than this (274,960 m^3/yr according to Aqualinc 2017). The reasons for this are further explained in the evidence from Mr Howard.

110. The turf growing operation has been active for around 4 years and is irrigated from November - February using k-line. Some of the turf is used on the golf course and the rest is sold. It is worth noting that growing and on-selling grass is a common activity in rural areas e.g. growing grass and selling it as hay, or feeding it to stock that are then sold. Irrigation demand for this turf operation has been assessed using Aqualinc values for pasture (see below).

111. Note that the annual historic use volume calculated by ORC[19] (1,423,230 m^3/yr) is higher than that applied for.

Aqualinc

112. The irrigable land (excluding the golf course) consists of just over 139.2 ha of productive farmland (including the 4 ha turf growing operation), some private gardens and recent plantings of native vegetation. Aqualinc 2017 indicates that the maximum annual irrigation demand for 139.2 ha of pasture in this part of the country is 1,074,608 m^3/yr.

113. Ms King has stated that, "*For Otago it is considered that a one in ten-year drought or 90th percentile is the most appropriate when considering efficient water use*". I'm not aware of any operative policy that states this.

114. Ms King also has also expressed concerns that if the maximum allowance is granted, this could be used as a precedent and applied

[19] ORC Section 42A Recommending Report, Alexandra King, 25 May 2021

region-wide in Otago. I don't see why this would be the case given that every consent application is assessed on its own merits.

115. Ms King has also stated that it could result in locking up water that would rarely be used and that could not thereafter be allocated to other applicants. Furthermore, ORC's own assessment has shown that the applicants have taken more water historically than is being applied for, so I believe the risk of unused water being locked up to be low. Ms King has recommended a consent condition that allows the consent to be reviewed if the allocation is not being used efficiently and so I am unsure why this is a concern. Regardless, this is not a determining factor in the case of this application as the annual volume sought is less than the maximum annual demand anyway.

116. I disagree with Ms King's view that the 90th %ile limits should be used. The natural reliability of the water take is the controlling factor on volumes available in a 1:10 dry year, not allocation volumes.

Stock Water

117. We have previously assumed that a continuous baseflow of 5 L/s in both the New Chums Race and the Brodie Race would also provide enough stock drinking water. However, Ms King is not satisfied that the continuous baseflow is an efficient use of water, and so the demand for stock drinking water needs to be considered more closely.

118. The applicant has provided revised maximum stock numbers:
- 2,500 sheep (ewes and lambs)
- 150 beef cattle

119. Using Ms King's allowances for different animals, the amount of water needed for stock drinking water is, therefore, calculated as follows:

Animal	Total No.	Water requirement per head (L/d)	Volume (m3/d)
Beef cattle	150	45	6.75
Sheep	2,500	5	12.5
		Total	**19.25**

Baseflow

120. Ms King has stated that she understands the need for a baseflow in the New Chums and Brodie Races based on the gravity fed system, maintaining the race, intakes and outtakes. However, she does not

consider the baseflow necessary during the irrigation season on the basis that there will be water travelling through the races for irrigation.

121. I understand Ms King's, however, there will often be periods when water taken for irrigation purposes is used to fill the storage ponds, during which time there will be no irrigation water conveyed in the races beyond the ponds. If we were to adopt Ms King's recommendation (no baseflow during irrigation season) there will be no baseflow to help convey stock water when the ponds are being filled. This could lead to animal welfare issues.

122. To provide ORC with more certainty that a continuous baseflow is not being allowed for unncessarily, we could allow for baseflow only 50% of the time during the irrigation season. The subsequent calculation, including an allowance for stock drinking water when there is no baseflow, looks like this:

Baseflow / Stock Water Allowances	**Volume (m^3/yr)**
10L/s baseflow for 123 days May-Aug (incl. stock water)	106,272
10L/s baseflow for 121 days Sept - Aug (incl. stock water)	104,544
Stock water for 121 days Sept - Aug (no baseflow)	2,329
Total	**213,145**

123. Note that Ms King has recommended that a water use efficiency report to be submitted each year, which would pick up on whether this is an inefficient use of water.

Breakdown of demand compared to volume sought

124. Based on the information above, the annual demand for water is now calculated as follows:

Use	**Volume (m^3/yr)**
Irrigation of 139.2 ha	1,074,608
Golf course	38,989
Baseflow/stock water allowance	213,145
Total	**1,329,742**

125. This volume being applied for (1,214,683 m^3) is less than this.

126. Note that the volume being applied for is only 85% of what has been taken historically according to ORC, and only 23% of the historic allocation (5,266,200 m3/yr).

127. The monthly volume applied for is not consistent throughout Ms King's s42A report. Based on the above, the maximum monthly rate of take will be as follows:

Use	Volume (m^3/month)
Irrigation of 139.2 ha (Aqualinc)	187,915
Golf course (based on max. historic monthly take)	8,889
Baseflow (50% of the time)	12,960
Stock water allowance	597
Total	**210,361**

128. Ms King has suggested that the annual volume sought be split up into one volume during the irrigation season, and a lower volume during winter[20]. I don't see how this would add any value and will only create unnecessary administration for both the Consent Holder and ORC's Compliance Team. Furthermore, the applicant may choose to start harvesting flood flows in late winter, but the regime proposed by Ms King does not allow for this. I suggest that the annual volume should not be split up as proposed by Ms King.

129. Further discussion on consent conditions is provided below.

[20] ORC Appendix 1 Recommended Consent Conditions Water Permit RM19.151.01

VALUE OF EXISTING INVESTMENT

130. BSTGT Ltd have advised that they have invested over $1.4 million on irrigation infrastructure to date, with further costs to be incurred as construction of the new ponds progresses. Further breakdown, or an updated total, can be provided upon request.

131. Mr McQuilkin has advised that he has invested the following over the past 16 years:

- $25k for off take infrastructure from Brodie Race and piping along Glencoe Rd to McQuilkin property
- $18k for the establishment of McQuilkin Pond
- $25k on reticulation of internal piping, valves, water measurement, telemetry and irrigation ports.
- $70k on the recent extension of high pressure piping ,valves and irrigation ports to mid and lower parts of property.
- $150k estimated costs associated with legal costs, establishment of easements and ongoing water monitoring fees.

132. The value of existing investment exceeds $1.69M.

POLICY ASSESSMENT

National Policy Statement For Freshwater Management 2020

133. The sole Objective 2.1 of the NPSFM 2020 is:

(1) The objective of this National Policy Statement is to ensure that natural and physical resources are managed in a way that prioritises:

(a) first, the health and well-being of water bodies and freshwater ecosystems;

(b) second, the health needs of people (such as drinking water);

(c) third, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.

134. The health and well-being of the freshwater ecosystem of New Chums Creek and the Royal Burn is prioritised by surrendering paper allocation, adherence to the primary allocation limit established under the RPW, and the imposition of a residual flow at the main stem points of take.

Operative Regional Plan: Water for Otago

135. Policy 5.4.3 s concerned with managing competing uses for water. Policy 5.4.3 gives preference to "existing lawful uses". Everything that the applicants are currently doing is an existing lawful use. Policy 5.4.3 recognises the "first in first served" allocation principle. Some submitters suggest that the applicants' primary allocation should be redistributed to other potential water users on the Crown Terrace. Many of these submitters own relatively-recent housing and lifestyle block developments that evidently have vulnerable or inadequate water sources. Policy 5.4.3 priorities protecting established water uses and points against allowing adverse effects on those uses by activities that come later. It would be contrary to policy 5.4.3 to reallocate water to other users through this process.

136. Policy 5.4.3 is consistent with objective 6.3.2 (provide for the needs of Otago's primary and secondary industries) and 6.3.3 (minimise conflict among those taking water by (among other things) ensuring continues access for the taking of water.

137. Policy 6.4.7 states, "The need to maintain a residual flow at the point of take will be considered with respect to any take of water, in order to provide for the aquatic ecosystem and natural character of the source water body." In general terms, imposing a residual flow is important to

ensure that streams are not dewatered (or run dry) as a result of abstractions. Policy 5.4.8 requires regard to the natural flow characteristics of the waterbodies, subject to the extent to which use and development has influenced those characteristics. The proposal is consistent with these policies.

Proposed Plan Change 7

138. I have read with the Commissioner's decision on Enfield and agree that the objectives and policies in PPC7 must be had regard to. The proposal is consistent with the requirements of Policy 10A.2.1, with further clarification provided below.

139. Policy 10A.2.1(b) requires there to be no increase in the area under irrigation. The mapped irrigation area has all been irrigated previously.

140. Policy 10A.2.1(d) requires that any existing residual flow, minimum flow or take cessation condition is applied to the new permit. I note that Deemed Permit 96285 requires that "*not more than one half of the flow in the Royal Burn North Branch shall be taken under this permit*". The proposed residual flow regime at the upper point of take on the Royal Burn North Branch would not satisfy this requirement. However, under the non-complying pathway, the proposal does not need to be consistent with every policy as long as the effects on the environment are less than minor.

141. In addition, the applicant is also replacing Water Permit RM14.364.01, which does not include any residual flow conditions. Water Permit RM14.364.01 allows up to 55.6 L/s to the abstracted at the upper point of take on the North Branch of the Royal Burn, and the proposal is for only 15 L/s at this location. There is no need, therefore, to replace Deemed Permit 96285 is the residual flow condition on that consent is causing concern.

142. In terms of Policy 10A.2.3, we are happy for the consent term to expire on 31 December 2035, as discussed below.

CONSENT CONDITIONS

143. I agree with Ms King that a consent term expiring 31 December 2035 is appropriate. My comments on the rest of Ms King's recommended conditions are as follows.

144. Condition 1: Agree, although I note that there are several storage ponds, not just one reservoir as referred to.

145. Condition 2: Agree.

146. Conditions 3 a) - c): Agree.

147. Conditions 3 d) - e): Disagree. I propose that both of these conditions are replaced with one condition that states:

The combined volume of abstraction under this permit must not exceed:

- *210,361 m^3 per month*
- *1,214,683 m^3 per year*

148. Conditions 4, 5 and 6: Disagree. I propose that both of these conditions are replaced with one condition that states the following, as per RSU's recommendation:

Water must not be abstracted from a point of take when a continuous residual flow extending 50 metres downstream from that point of take cannot be maintained.

149. Conditions 7, 8 and 13: Whilst I agree with what Ms King is trying to achieve here, I believe that what she has proposed is inappropriate and does not provide certainty that the proposed residual flows will be maintained at all times. Ms King's specifications have not been designed for the particular locations by a suitably qualified hydraulic engineer, and Ms King has not explained how they are fit for purpose. Furthermore, Ms King's conditions do not require monitoring of the residual flow and so there is no way of ensuring that her specifications actually achieve what is intended.

150. There is reason to believe that the proposed residual flows can be achieved using the existing infrastructure;

- In January 2018, during an extreme low flow period, visible flow was observed downstream of both of the 'partial weirs' (as described in the application).

- Flows bypassing the 'partial weir' at the New Chums Creek were during the site visit with Ms King in January 2021.
- Ms Miller has suggested that the 'partial weir' at the upper North Branch of the Royal Burn point of take will provide a residual flow of >10 L/s using the existing infrastructure.

151. However, to provide certainty that the proposed residual flows will be provided at all times, I suggest that Ms King's recommended conditions 7, 8 and 13 are replaced with the following condition:

a. Within 12 months of the first exercise of this consent, the Consent Holder must write to the Consent Authority detailing how the visual residual flows in Condition X are achieved.

i. This may include a fit-for-purpose engineering solution that allows for the residual flow to be maintained at all times when there is a surface water flow upstream of the points of take; or

ii. The applicant may include photographic evidence to demonstrate that the current infrastructure allows for the residual flow to be maintained at all times when there is a surface water flow upstream of the points of take.

b. By 31 July 2022 and each year thereafter for the duration of the consent, the Consent Holder must submit to the Consent Authority:

i. Photographic evidence of the visual residual flows, recording the date and time of the photographs, taken on the 1st of each month during the period 1 December to 31 March of that year. Photographs must be in colour and in JPEG or other acceptable form; or

ii. Monitoring data collected using a suitably engineered device[21].

b. Any infrastructure as required by Conditions (a) and (b) must be maintained in good working order, to ensure that it is performing as designed. Records must be kept of all inspections and

[21] The applicants would like to explore the possibility of using automatic devices, such as moisture detection devices or flow level recorders in lieu of manual photgraphic monitoring.

maintenance and these must be available to the Consent Authority on request.

This will allow the applicants to determine the most appropriate engineering solution(s) to ensure that the necessary residual flows are provided at the subject sites.

152. Under the Resource Management (National Environmental Standards for Freshwater) Regulations 2020 (NES-F) any future modifications to the intake structures may require consent as a discretionary activity if not covered by regulations 70 and 71. However, any such consents can be applied for at a later date prior to any intake modification works being undertaken, and it is not necessary to delay consideration of the replacement of the existing permits in the meantime.

153. Condition 9: Agree, except that the low flow cut-off should be 5 L/s, not 10 L/s.

154. Conditions 10, 11 and 12: Agree, except that these can be rolled into one (with the higher level of accuracy for the upper RBNB point of take noted) to make the consent easier to read.

155. Condition 14. Agree, except that it should read “rated weir or rated staff gauge” and “low flow cut-off” (rather than “residual flow”).

156. Condition 15. Agree, except that this needs to refer to the correct watercourses and not Poison Creek.

157. Condition 16. Disagree, for the reasons given in paragraph 56-61.

158. Condition 17. Disagree, for the reasons given in paragraphs 50-55.

159. Conditions 18 and 19: Agree, with administrative updates once the rest of the consent conditions have been renumbered.

CONCLUSION

160. I am of the view that the proposal is consistent with all relevant objectives and policies, including being consistent with the NPSFM. I support the recommendation that consent should be granted to the 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, in accordance with the draft conditions attached, for a term expiring 31 December 2035.

Dated this 1 day of June 2021

Hilary Lennox

Attachments:

- RSU assessments of BTSGT Limited water take RM19.151 to take water from the Royal Burn and New Chum Creek, Pete Ravenscroft, 13 June 2019
- LOFTS Water Ltd application for Certificate of Compliance
- LOFTS Water Ltd Certificate of Compliance RM20.330
- Recommending Report RM16.035
- Discharge Permit RM16.035
- Baker Steed Deemed Permit Applicattion
- Baker Steed WM1285