BEFORE THE OTAGO REGIONAL COUNCIL

IN THE MATTER	of the Resource Management Act 1991
AND	
IN THE MATTER	Luggate Irrigation Company and Lake MacKay Station. Water Permit Application RM18.345

STATEMENT OF EVIDENCE FOR NIGEL PARAGREEN ON BEHALF OF THE OTAGO FISH AND GAME COUNCIL

Dated 20 OCTOBER 2019

Introduction

1. My name is Nigel John Paragreen.
2. I am an employee of the Otago Fish and Game Council (**Fish and Game**) since January 2017; prior to this I was employed in Australian natural resource management fields for 3 years, undertaking land management and conservation planning with rural communities and remote indigenous communities in statutory and non-statutory fields of work.
3. I hold a Bachelor of Economics, majoring in Natural Resources and Environment, and a Master of Environmental Management in the field of Sustainable Development, from the University of Queensland.
4. My role at Fish and Game requires me to provide RMA advice to my Council and act on their behalf during proceedings. Due to the high demand for Fish and Game input to deemed permit applications in the past years, I have become familiar with the context and issues common to many deemed permit applications.

Abbreviations, acronyms and nomenclature

5. I will use several abbreviations in this evidence, which are as follows:
    a. the Otago Fish and Game Council: **Fish and Game**;
    b. Luggate Irrigation Company: **LIC**;
    c. Lake McKay Station: **LMS**;
    d. Criffel Water Limited: **CWL**;
    e. the Otago Regional Council: **ORC**;
    f. the Resource Management Act (1991): **RMA**;
    g. the National Policy Statement for Freshwater Management 2014 (updated 2017): **NPS-FM**;
    h. Freshwater Management Unit: **FMU**;
    i. the Partially Operative Otago Regional Policy Statement 2019: **pORPS**;
    j. the Regional Policy Statement for Otago 1998: **RPS**;

k. the Regional Plan: Water for Otago: **RPW**;

l. Progressive Implementation Programme: **PIP**;

m. the Sports Fish and Game Bird Management Plan 2015-2025: **SFGMP**;

n. Kāi Tahu ki Otago Natural Resources Management Plan 2005: **KTONRM**; and

o. *Lindis Catchment Group v Otago Regional Council* [2019] NZEnvC 166: **the Lindis decision**

6. Similarly, there are many differing names used for various waterbodies in the Luggate Catchment. For consistency in this evidence, I will use the following:

   a. the **North Branch**: the mainstem of the northern branch of the Luggate Creek, on which the CWL intake is located;

   b. the **Alice Burn**: the mainstem of the southern branch of Luggate Creek;

   c. the **Alice Burn Tributary**: the tributary of the Alice Burn from which LMS abstract water; and

   d. the **Main Stem**: the reach directly downstream of the confluence with the North Branch and Alice Burn.

7. In this evidence, I will describe abstraction points by the entity proposing to take water and the waterbody the proposed take will be situated within. Eg. LIC North Branch take.

Executive summary

8. In this evidence, I consider the effects of the application against the existing environment, as set out in the legal opinion provided to the ORC[1]. To do so, I have considered a series of flow regimes which I have called the naturalised flow regime, the existing flow regime, the future flow regime, the existing environment flow regime and the application

[1] Memorandum of Ms de Latour, 26 September 2019

flow regime. Where possible, I have used the same nomenclature as Mr Hickey in his evidence.

9. The water policy framework relevant to this application is incomplete and the ORC has outlined significant changes in coming years. Until that point, key concepts such as over-allocation are not able to be fully considered.

10. With the addition of a residual flow for the LMS Alice Burn Tributary take and a maximum of a 10 year term on the consent, I find the application to be broadly consistent with the RPW, RPS and pORPS framework.

11. The application is not consistent with all objectives of the NPS-FM, partly due to the process set out in Policy CA1-CA4 not having been implemented yet. The additional residual flow and term as described above help resolve and/or mitigate this issue.

12. Provisions of the SFGMP and KTONRM are relevant to this consent. Of particular note are provisions 5.5.2 and 5.5.4 of the KTONRM, which links mahika kai and introduced species.

13. With my suggested alterations to proposed consent conditions, the fish screen provisions proposed would be consistent with the policy framework. They would provide positive effects while avoiding or mitigating adverse effects. The exception to this is the question of whether the unmetered by-wash of water to generate a sweep velocity past the screens would constitute a diversion.

Scope of evidence

14. I have been asked by Fish and Game to represent them at the hearing for RM18.345 and provide relevant planning evidence.

15. In preparing this evidence, I have reviewed material from the following sources:

    a. applications, reports and evidence relating to this evidence:

        i. the LIC and LMS resource consent application;

        ii. CWL resource consent application documents, as provided in the original LIC and LMS application package and s42A report;

iii. the s42A report and the authors' response to questions;

iv. the evidence of Mike Kelly;

v. the evidence of Matthew Hickey;

vi. the evidence of Kate Scott, including the *Applicant Consent Conditions FINAL 09102019 Track Changes* document;

vii. the evidence of Ben Trotter[1];

viii. the sworn affidavit of Ian Jowett;

ix. the *Lindis Decision* document, as entered into evidence; and

x. the evidence of Morgan Trotter[2];

b. relevant legislation, policy documents and plans:

i. the Resource Management Act (1991);

ii. the National Policy Statement for Freshwater Management 2014 (updated 2017);

iii. the Partially Operative Otago Regional Policy Statement 2019;

iv. the Regional Policy Statement for Otago 1998;

v. the Regional Plan: Water for Otago;

vi. the Sports Fish and Game Bird Management Plan 2015-2025; and

vii. Kāi Tahu ki Otago Natural Resources Management Plan 2005.

16. In its submission, Fish and Game sought several outcomes, some of which appear to have been adopted, to varying degrees, by the applicant and the s42A authors. While I have considered the documents

[2] As there are two Mr Trotters providing evidence, I shall add the relevant first initial to their citation to avoid confusion eg. Mr M Trotter

above in my consideration, I will limit the discussion in my evidence to provisions relevant to the outcomes sought by Fish and Game.

17. As such, the scope of my evidence will be
    a. Flow regimes to consider
    b. The Lindis decision
    c. State of the Otago water policy framework
    d. Policy CA1-CA4 and implications for consents
    e. The policy framework in relation to assessing the application
        i. Residual flows
        ii. Allocation sought
        iii. Duration of consent
    f. Races, by-wash and fish screens
18. To avoid doubt, I am submitting this as non-expert evidence.
19. Regardless, I do intend to provide unbiased planning evidence. I have read the expert witness code of conduct and agree to comply with it in the preparation and presentation of my evidence. I have not omitted to consider material facts known to me that might alter or detract from the opinions I have expressed.

Flow regimes to consider

20. In deemed permit applications, there is often a wide array of flow regimes which are discussed. To avoid confusion as much as possible, I would like to use common terms for these regimes as much as possible.
21. In paragraph 12 of his statement of evidence, Mr Hickey outlines three flow regimes which I believe are useful contextual benchmarks. These are:
    a. *Naturalised Flow Regime*: the catchment without the impact of abstraction.

b. *Existing Flow Regime*: the current abstraction regime using current deemed permits, consents and permitted activities, with a 180l/s minimum flow. (at times Ms Scott refers to a similar regime as the status quo[3])

c. *Future Flow Regime*: The application flow regime with the additional impact of the CWL application, if granted in the form recommended in the s42A report.

22. The ORC has also sought a legal opinion[4] on the existing environment to be considered in assessing the effects of this application and the priority order in which the LIC and LMS and CWL applications should be considered.

23. To me, the reasoning in the ORC's legal opinion makes sense.

24. Past 1 October 2021, no deemed permit in the Luggate Catchment will exist. The consents being sought to continue water abstraction previously serviced by deemed permits are both in the application stage and I have no means to guarantee whether they will be granted or what conditions may be imposed if so. I must instead fall back on the known fact that the deemed permits will cease to exist in 2021.

25. This means that past 2021, when the consents are proposed to become operative, the prevailing flow regime would be one without the impact of the deemed permits, but with the impact of other granted water abstraction consents and abstraction granted by permitted activity rules.

26. To me this is a logical baseline to consider effects against, as consideration of the existing flow regime in a consent to continue the activity enabled by a deemed permit would mean that the impacts of that permit cannot be considered. A hypothetical proposed consent that exactly emulated the activity permitted under a deemed permit would have absolutely no adverse effects. Logically, that cannot occur as every action has a consequence and taking water will have some environmental impact, no matter how small.

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[3] Evidence of Ms Scott paragraph 58

[4] Memorandum of Ms de Latour, 26 September 2019

27. Equally importantly, the legal opinion advises that the CWL application should be decided before the LIC and LMS application. However, again when writing this evidence, I cannot guarantee the result of the CWL application. As a result, I cannot consider the cumulative impacts of the CWL application and the LIC and LMS application. Although, this may be taken into account when the Commissioners consider the LIC and LMS application.

28. Therefore, at times I feel it may be useful to discuss the cumulative effect of the future flow regime. An inherent weakness in this approach is that if the CWL application were to be altered or granted in a way which is not proposed, those sections of my evidence would become less useful, depending on the degree of alteration.

29. The flow regimes described by Mr Hickey do not fit neatly into either the existing environment planning construct described in the legal opinion or the catchment with the impact of the LIC and LMS application only. For these reasons, I have described the two additional flow regimes below, which I will be the basis for my analysis:

    a. *Existing Environment Flow Regime*: after October 2021 (when the deemed permits are surrendered), the catchment without the impact of abstraction from activities covered in the LIC and LMS and CWL applications but with water takes permitted by the RPW and other takes as currently granted.

    b. *Application Flow Regime*: the existing environment with activities as described in the most up to date version of the LMS & LIC application.

30. Given the absence of granted consents for abstraction above the LIC and LMS takes in the catchment and the small scale of permitted activity rules[5], the existing environment flow regime will be very close to that of the naturalised flow regime.

31. As an addition to this discussion, I note that Ms Scott considers the implications of NPS-FM Policy B7 on the need to use the existing

[5] Permitted activity rules in the RPW are 12.1.2.0 – 12.1.2.6

environment as a starting point for an assessment of effects[6]. I interpret Policy B7 as directing regional councils to immediately amend the regional plan, rather than to consider the policy in a consenting process before it is inserted into a plan.

32. However, to avoid doubt, if Policy B7 were to be considered in a consenting process prior to wording to that effect being put into a regional plan, I do not agree that it implies the existing flow regime is the starting point. The policy does refer to "change in character, intensity or scale of any established activity" in the context of an any application being considered. However, it gives no direction of what environmental baseline to consider a change against.

33. As a result, I see this policy as being complementary with the existing environment case law as described in the legal opinion. The policy appears to be a precautionary backstop to ensure adverse effects do not get worse in the interim while local authorities are implementing the NPS-FM. Having regard to this policy using the existing environment flow regime as a baseline would achieve that goal.

The Lindis decision

34. The Lindis decision has been submitted as evidence, with Counsel for the applicants noting that the applicants' evidence does not fully take account of it[7].

35. The Lindis decision differs from the Luggate case. Being a consenting process, the baseline for assessing both the LIC & LMS and CWL applications will take place against the existing environment. In the Lindis decision, The Court considered the status quo and naturalised flows relevant in its interpretation of Schedule 2D of the RPW.

36. This is critical as Schedule 2D does not consider the existing environment in the way that I described above. In the context of the Luggate catchment, the status quo described in the Lindis decision would be equivalent to the existing environment flow regime. This

[6] Evidence of Ms Scott paragraph 58

[7] Memorandum of Counsel for the Applicants 8 October 2019 para 6(a)

means that that baseline comparison identified in the Lindis decision[8] would be equivalent the existing environment flow regime in the Luggate context. This will have implications for the protection of salmonid habitat.

37. However, there are further fundamental differences. The Luggate case has factual differences which mean the situation may be materially different to that of the Lindis. The following table outlines some additional key differences between the cases.

Luggate	Lindis
The minimum flow and primary allocation are not part of the scope of this proceeding and only the consent applications are being considered at hearings.	The decision is in relation to a plan change for the minimum flow and allocation for the catchment. Within this, the consent application was considered.
The bulk of water abstraction in the catchment is considered in two concurrent decisions.	The bulk of water abstraction in the catchment is considered in the one application, with a decision on this to follow.
Flow records and observations are limited.	Long term flow records existed for the catchment.
Primary allocation in the application flow regime is no more than is used currently; however, large blocks of supplementary flow are sought. (although, CWL have suggested that some primary allocation has been surrendered).	Environmental improvements over the existing flow regime were largely predicated on moving the location of abstraction, with a small amount of additional supplementary allocation being sought.
The catchment flow is derived from two main branches with a confluence low in the catchment and hydrological evidence. has not discussed significant gaining or loosing reaches.	Catchment flow is derived largely from the upper sections of the catchment, with complex loosing and gaining reaches downstream.

[8] *Lindis Catchment Group v Otago Regional Council* [2019] NZEnvC 166 paragraph 207

A return of native species has been identified by numerous parties as desirable for the catchment.	Native species were considered largely absent in affected reaches, with no plan to re-introduce them.

Table 1: Key differences between the Luggate and Lindis cases

38. As a result, I am cautious in my application of the Lindis decision in this planning evidence.

State of the Otago water policy framework

39. Otago water policy documents are aging. The RPS became operational in 1998, and the RPW in 2004. When the NPS-FM and its variants came into effect, the ORC had generally thought that its water policy framework was consistent, bar a few small plan changes[9]. However, this was questioned by stakeholders[10].

40. Within the last few years, the RPS has been reviewed and parts are subject to court proceedings. The remainder were made operative in 2019 in the form of the pORPS. Unfortunately, at the time of writing all provisions and explanatory material in Chapter 3 are not operative and these are most relevant to the LIC & LMS application.

41. In addition to this, a recent Environment Court decision has "… *determined that the pORPS is not consistent with the direction of King Salmon, in that it is seeking to allow an overall subjective judgement"*[11]. It is unclear what the implications of this are yet for the plan but it seems likely changes will need to be made in the near future.

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[9] Hawkins, L., & Dawe, A. (2018*). Progressive Implementation Program (PIP) for the NPSFM*. Dunedin: The Otago Regional Council. Retrieved from https://www.orc.govt.nz/media/6263/council-agenda-31-october-2018.pdf

[10] Ministry for the Environment. (2017). *National Policy Statement for Freshwater Management Implementation Review: Otago*. Wellington: Ministry for the Environment.

[11] *Dawe, A. (2019). General Manager's Report on Progress. Dunedin: The Otago Regional Council. Retrieved from https://www.orc.govt.nz/media/7239/policy-20190911.pdf*

42. Looking instead toward the RPS, this plan came into effect 13 years prior to the NPS-FM's introduction in 2011 and 19 years prior to the most recent revision in 2017. The RPS document doesn't identify any revisions that have been made during this time. Given the RMA s79(1) requirement to review plan provisions every 10 years, the age of this document means it is not an ideal fallback for decision making.

43. The RPW is not an ideal document either. Key tests in the NPS-FM and RPW differ in ways which provide alternate direction. For example, RPW objectives 5.3.1 and 6.3.1 direct decision makers to maintain or enhance natural values and life supporting capacity, whereas, the context of "safeguard" in the NPS-FM implies that the matters listed can be considered using a range of baselines. Similarly, NPS-FM Objective B5 nestles economic well-being within limits set by the preceding objectives, whereas the RPW balances competing environmental and social objectives. Over-allocation and Te Mana o te Wai are not even considered within the RPW.

44. Therefore, I conclude that the RPW does not give effect to the NPS-FM.

45. On this point, the ORC now agrees. In late 2018, a staff report to the ORC discussed giving effect to the NPS-FM and recommended adopting a PIP[12], stating (explanatory note added in square brackets):

> *"Some of the previous work mentioned [referring to RPW plan changes] occurred prior to the 2014 and 2017 updates of the NPSFM. The values conversations were not undertaken in relation to the NPSFM compulsory national values, and other national values, although there is likely to be at least, some cross over. Further, values conversations that have occurred have not been undertaken within a FMU framework, have not been clearly linked to objective setting and have only focussed on singular issues. Therefore, elements of the process set out in policies CA1- CA4 have not been fully addressed, leaving gaps with meeting requirements of the NPSFM. We need to revisit our approach to both water quantity and quality to ensure that the right stakeholders are included, that we account for national values, that stakeholders understand where the values*

[12] Hawkins, L., & Dawe, A. (2018*).* Ibid.

take the future policy direction in terms of objective and limit setting. With regard to limit setting, previous commentary by ORC has not been clear as to how it will address overallocation, particularly with regard to water quantity.

The NPSFM is directive in relation to Councils responsibilities in avoiding further over allocation and phasing out existing over allocation, where it has been identified. Further, the concept of overallocation is not addressed within the current water plan, and existing policies are overdue for a review (as per s.79 of the RMA). Therefore, as part of the process of setting limits ORC needs to consider whether any FMUs are overallocated with regard to water quality and quantity and then set a policy framework which will phase out over allocation."

46. A PIP was adopted by the ORC soon after that report, in which it will undertake a review of the RPW which will be notified by 2025. The ORC website currently gives public notices that NPS-FM Policies AA1, A1, A2, A3, A4, A5, A6, A7, B1, B2, B3, B4, B5, B6, B7, B8, C1, C2, CA1, CA2, CA3 and CA4 are to be implemented in future[13]. Because the ORC has until 2030 to implement these policies, it is relevant only to give regard to the objectives of the NPS-FM, as they have immediate effect within the document.

47. In summary, the policy framework to have regard to under RMA s104(1)(b) is not in an ideal state. The RPW is an aging document that does not give effect to the NPS-FM; the RPS is an even older document; the pORPS is not yet operational for key provisions relating to this application and the judgement basis has been called into question by the Environment Court; and decision makers may only have regard to the objectives of the NPS-FM at this time. Significant changes to the policy framework have been identified by the ORC in coming years, including reviewing revisiting the previous approach to water quantity.

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[13] The Otago Regional Council. (2019, January 29). *Progressive Implementation Programme*. Retrieved October 17, 2019, from Otago Regional Council: https://www.orc.govt.nz/managing-our-environment/water/water-quality-targets/progressive-implementation-programme

Policy CA1-CA4 and implications for consents

48. The minimum flow and primary allocation for the Luggate catchment were set as part of Plan Change 1B and became operational in March 2010. I understand that the minimum flow and allocation have not been reviewed since. Therefore, in accordance with s79(1), I would have expected the minimum flow to have been reviewed by March 2020.

49. This is not likely to occur given the PIP timeframe adopted by the ORC. Based on the discussion by Hawkins and Dawe[14], in the next few years the ORC will undertake the process set out in NPS-FM Policies CA1-CA4 to adopt updated limits in FMUs across Otago. At the time of writing, the ORC has identified FMUs[15] and the Luggate catchment is situated within the Dunstan Rohe in the Clutha / Mata-au FMU.

50. Going through the Policy CA1-CA4 process is an important step for implementing the NPS-FM in Otago, as it is the most logical way to enable a discussion of over-allocation. The definitions of over-allocation, freshwater objective and limit in the NPS-FM are critical to this conclusion:

    a. *"Over-allocation" is the situation where the resource:*

        a) has been allocated to users beyond a limit; or

        b) is being used to a point where a freshwater objective is no longer being met.

    This applies to both water quantity and quality

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[14] Hawkins, L., & Dawe, A. (2018*).* Ibid.

[15] The Otago Regional Council. (2019, April 3). *Ki uta ki tai (from the mountains to the sea) influences setting of Freshwater Management Units by Otago Regional Council*. Retrieved October 17, 2019, from The Otago Regional Council: https://www.orc.govt.nz/news-and-events/news-and-media-releases/2019/april/ki-uta-ki-tai-from-the-mountains-to-the-sea-influences-setting-of-freshwater-management-units-by-otago-regional-council

b. *"Limit" is the maximum amount of resource use available, which allows a freshwater objective to be met.*

c. *"Freshwater objective" describes an intended environmental outcome in a freshwater management unit.*

51. A freshwater objective is developed through the process set out in Policy CA1-CA4. Therefore, until freshwater objectives are set for each FMU, we cannot consider if a limit is appropriate or if over-allocation exists. Because of this, the consideration of over-allocation has the scope to change dramatically in the Luggate catchment as the ORC undertakes the Policy CA1-CA4 process in the next few years.

52. Changing the allocation and minimum flow will only have impacts on the ground once it becomes a consideration for existing consents. For example, Rule 12.1.4.4 of the RPW dictates that a minimum flow will be implemented in the Luggate catchment once all existing consents have been reviewed[16]. Similarly, with the grandfathering method of allocation in RPW Policy 6.4.2, a new allocation limit may be set but it would not have effect until consents are either reviewed or their term expires. I am not confident that an existing abstraction consent could be reviewed to phase out over-allocation without the risk of frustrating the consent.

53. If this were to be the case, the result would be to "lock in" an allocation for the term of consent. In effect, the NPS-FM may be implemented by 2030 as per the PIP; however, if the LIC & LMS consent were granted for a 35 year term, a revised allocation, for example for the purpose of phasing out over-allocation, may not be implemented on the ground until 2056. This is a considerable difference in time frames.

54. The same concern may not be limited solely to allocation either. Freshwater objectives set through Policy CA1-CA4 may ultimately consider any value identified by the community, that the ORC considers appropriate. The process is potentially wide in scope and may eventually include other limits which would frustrate an existing consent if imposed upon review.

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[16] The way this rule is written, it appears to be intended to relate to the implementation of the original minimum flow, which I understand is in place, but it would also capture any future changes to the minimum flow.

55. This has implications for the relevance of the existing minimum flow and primary allocation. It means that the presence values for these in Schedule 2A and 2B of the RPW does not automatically mean that the objectives of the NPS-FM are met.

56. In summary, the current policy framework is incomplete, and the ORC has committed to resolving this through a future planning process with a wide scope for catchment management. In this context, a precautionary approach to consent term for surface water abstraction may be appropriate so that the inadequacy of the current planning framework is not locked in for long timeframes.

Catchment characteristics relevant to planning provisions

57. Before considering the application against the policy framework, I would like to summarise the catchment's characteristics and flow regimes. The most comprehensive description of the catchment I have come across comes from the Management Flows for Aquatic Ecosystems in Luggate Creek (my note in square brackets)[17]:

"The Luggate Creek Catchment is found in Central Otago. It extends for approximately 20 km and has an area of approximately 121 km^2. Luggate Creek is relatively short and has one major tributary, the Fall Burn [Alice Burn], which merges with Luggate Creek about 2 km above the State Highway 6 bridge. The Luggate Creek Catchment drains the northern end of the Criffel and Pisa Ranges. The upper Luggate Creek Catchment is made up of a mixture of tussock and manuka and has a reliable rainfall. It flows in a north-easterly direction and joins the Clutha River at Luggate.…

Original vegetation of the catchment consisted of snow tussock and manuka. The native plant population has been modified with the spread of introduced plants and over sowing of introduced pasture grasses….

Flow requirements for Luggate Creek were assessed in two reaches, between the main highway and the Clutha River confluence, and

[17] Otago Regional Council. (2006). *Management Flows for Aquatic Ecosystems in Luggate Creek.* Dunedin: Otago Regional Council.

between the large intake weir and the main highway. The creek was mainly willow-lined with grassed stock paddocks running up to the creek sides. It was more open and steeper at the top of the reach with willows. There were more runs and riffles than pools, but the pools were generally long. The upper section was steep below the weir, with mainly bedrock and boulders. Further downstream, the gradient was lower with more pools and stock access. Runs and riffles were the predominant habitat types, but the pools were generally longer than the runs and riffles."

58. A comprehensive description of the fish species present is discussed in section 6 of the combined s42A report. This includes a discussion of RPW Schedule 1 values. Unfortunately, the Schedule 1A description misses the presence of resident, spawning and juvenile salmonids in the catchment, which has been well documented in section 6 and by other parties[1819].

59. Similarly, longfin eel (*Anguilla dieffenbachia*) habitat is not cited within schedule 1A. I understand that Aukaha are interested in returning this species to the catchment and that consents for energy generation dams downstream have conditions requiring the upstream re-introduction of eels. In this context of those consent conditions, longfin eels would form part of the existing environment.

60. The preamble of Schedule 1 notes that "*natural and human use values are not limited to those characteristics identified in the schedule…. The non-listing of values in Schedule 1A is not to be taken as meaning that an area, value or habitat is not important or worthy of protection".* I believe it would be an oversight not to consider salmonid and longfin eel habitat when assessing this application.

61. Turning now to the application flow regime and future flow regime, I feel it is relevant to summarise the inflows and outflows proposed, as this is the crux of the potential adverse effects. This can be calculated easily, using figures supplied in the application and the NIWA surface water

[18] Otago Fish and Game Council Submission on RM18.345, paragraphs 10–15

[19] s42A Report, Appendix 4: Ryder science assessment RM18.345 24 Sept 2019

modelling tool Shiny[20], by retrieving the modelled MALF from the NIWA web portal and subtracting or adding the primary allocation, residual flows and downstream inflows as necessary. Due to the simplicity of the calculations, I do not believe this is outside the skillset of an average person.

62. In Tables 2 and 3, below, have presented the key catchment statistics at low flows. This includes inflows under the application and future flow regimes and the naturalised flow (which will be very similar to that of the existing environment flow regime) and the primary allocation and residual flows sought by applicants[21].

Key catchment statistics at MALF	Naturalised flow regime inflows	Application flow regime inflows	Primary allocation	Residual flow
LMS Alice Burn	90l/s	90l/s	93l/s	46l/s
LMS Alice Burn Tributary	10l/s	10l/s		-
LIC Alice Burn	124l/s	68/s	87l/s	Visual flow
LIC North Branch	207l/s	207l/s		100l/s

Table 2: inflows, primary allocation and residual flows for take points under the application flow regime

[20] Booker, D. J., & Whitehead, A. L. (2017). NZ River Maps: An interactive online tool for mapping predicted freshwater variables across New Zealand. Christchurch: NIWA. Retrieved from https://shiny.niwa.co.nz/nzrivermaps/

[21] Evidence of Ms Scott: Applicant Consent Conditions FINAL 09102019 Track Changes

Key catchment statistics at MALF	Naturalised flow regime inflows	Future flow regime inflows	Primary allocation	Residual flow
LMS Alice Burn	90l/s	90l/s	93l/s	46l/s
LMS Alice Burn Tributary	10l/s	10l/s		-
LIC Alice Burn	124l/s	68/s	87l/s	Visual flow
LIC North Branch	207l/s	103/s		100l/s

Table 3: inflows, primary allocation and residual flows for take points under the future flow regime

The policy framework in relation to assessing the application

63. RMA s104(1) details the policy documents which are to be had regard to when considering applications. This includes "*any other matter the consent authority considers relevant and reasonably necessary to determine the application"*[22]. I will consider relevant policies below, as they relate to the residual flows; allocation sought; and races, duration of consent and races, by-wash and fish screens.

64. In this assessment, I have primarily considered the impact of the application flow regime on that of the existing environment flow regime. However, it is worth mentioning that the lion's share of the total catchment primary allocation is proposed by CWL, which is in the application stage at the time of writing this evidence and may or may not have been granted as a consent prior to a decision being made on the LIC & LMS application.

65. In theory the cumulative effects would be addressed by adherence to the minimum flow and primary allocation set in the RPW. However as discussed above, I do not consider that the adherence to these automatically means the application will be consistent with all relevant policy provisions.

[22] RMA s104(1)(c)

66. Similarly, substantial supplementary allocation is sought for the catchment. This represents an increase in abstraction demand for the LIC and LMS application, as the applicants have amended the primary allocation sought to reflect current needs and will use supplementary allocations for future development. This will have adverse effects but due to the nature of supplementary allocations and the high supplementary minimum flows I believe they will be consistent with the relevant policy provisions. I do not focus on supplementary flows in this evidence.

RPW

67. Although the RPW gives effect to the NPS-FM, it is still to be had regard to under RMA s104.

68. The relevant rules of the RPW which relate to the application are Rules 12.1.4.4 and 12.1.4.7, relating to the take of surface water as primary and supplementary allocation in this catchment. On this basis, the activity status would be restricted discretionary, with the provisions of Rule 12.1.4.8 covering the discretion to be considered. This provides scope that includes:

    d. allocation proposed, intake/race structure configuration and efficiency of proposed water use/transport;

    e. characteristics of the catchment from which water is abstracted;

    f. the impact of the application on and inclusive of competing lawful local demand - ie. cumulative effects of abstraction in the catchment;

    g. the current minimum flow and the potential future minimum flow relevant to the Luggate catchment;

    h. imposition of residual flows;

    i. fish screening and use of races for spawning;

    j. cooperative abstraction with CLW, as proposed by the applicants; and

    k. resource consent duration.

69. The RPW provisions relevant to this scope is considered below.

70. In regard to how the allocation limits are set in the plan. I agree with the logic set out in section 7.0 and 10.1 of the s42A report, referring to Policies 6.4.0, 6.4.2, 6.4.2A and 6.4.2AA. I am also confident that the supplementary allocation blocks have been accurately calculated in line with Policy 6.4.9 and Method 15.8.1A.

71. Similarly, I agree with the comments from the s42A report regarding policies 6.5.3, 6.4.5 and 6.4.11 and the minimum flow.

Objective 5.3.1*: To maintain or enhance the natural and human use values, identified in Schedules 1A, 1B and 1C, that are supported by Otago's lakes and rivers.*

Policy 5.4.2: *In the management of any activity involving surface water, groundwater or the bed or margin of any lake or river, to give priority to avoiding, in preference to remedying or mitigating:*

(1)Adverse effects on:

(a) Natural values identified in Schedule 1A;

(b) Water supply values identified in Schedule 1B;

(c) Registered historic places identified in Schedule 1C, or archaeological sites in, on, under or over the bed or margin of a lake or river;

(d) Spiritual and cultural beliefs, values and uses of significance to Kai Tahu identified in Schedule 1D;

(e) The natural character of any lake or river, or its margins;

(f) Amenity values supported by any water body; and…

Objective 6.3.1*: To retain flows in rivers sufficient to maintain their life-supporting capacity for aquatic ecosystems, and their natural character.*

Objective 6.3.6*: To minimise any adverse downstream effect of managed flows.*

72. Mr Trotter has identified that, "*from an ecological perspective, it is advisable to consider environmental flows and allocations [sic] limits*

simultaneously as both can impact on stream ecosystems""[23]*.* Mr Trotter has identified that the primary allocation sought at a catchment level in the application flow regime is not precautionary but potentially reasonable[24].

73. There is some degree of interpretation required here when it comes to the definition of "maintain" in the objective. In an absolute sense, to maintain all aquatic habitat, for example for koaro or salmonids downstream of the abstraction points, would mean that no abstraction could occur, as any water removed is water that fish could not use as habitat. However, I believe Mr Trotter was discussing the impact of abstraction on the functioning of habitat. In this context, I would consider it accurate to say that under the application regime at a catchment scale, the allocation sought would maintain habitat for aquatic species and therefore avoidance of adverse effects in Policy 5.4.2 is not of great concern.

74. However, if the future flow regime was to be considered to understand cumulative effect, Mr Trotter has questioned whether the allocation will lead to adverse effects[25]. Given this, it is not clear to me if the future flow regime would maintain values and life supporting capacity, compared to the existing environment flow regime. It is also questionable how one might avoid adverse effects, as directed by Policy 5.4.2. In an abstraction context, avoiding could only take the form of not abstracting. If the primary allocation within the future flow regime were lowered, the regime at a catchment scale would better meet the objectives and policies discussed so far.

75. At many of the points of take in the application flow regime, the allocations compared to inflows are much higher than identified by Mr Trotter as precautionary. This is tempered somewhat at low flows for the LMS Alice Burn take, as the residual flow will effectively mean low flows are split evenly between the environment and abstraction. A major reason for the mismatch between allocation and inflow is likely because

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[23] Evidence of Mr M Trotter, paragraph 9

[24] Evidence of Mr M Trotter, paragraph 19-22

[25] Evidence of Mr M Trotter, paragraph 22

the allocations for each company are split between two takes. There is no guarantee that the full rate of primary abstraction will not be taken from one point of take, provided there is enough water available.

76. The same conclusion could be drawn for the North Branch but only when considering the future flow regime.

Objective 5.3.3: *To protect the natural character of Otago's lakes and rivers and their margins from inappropriate subdivision, use or development.*

Policy 5.4.8*: To have particular regard to the following features of lakes and rivers, and their margins, when considering adverse effects on their natural character:*

(a) The topography, including the setting and bed form of the lake or river;

(b) The natural flow characteristics of the river;

(c) The natural water level of the lake and its fluctuation;

(d) The natural water colour and clarity in the lake or river;

(e) The ecology of the lake or river and its margins; and

(f) The extent of use or development within the catchment, including the extent to which that use and development has influenced matters (a) to (e) above.

77. Policy 5.4.8 is curious in the sense that it establishes the natural characteristics of the catchment as considerations then in reduces their consideration in (f). However, in this case the existing environment flow regime would be the level at which (f) would be set, and this is very similar to the naturalised flow regime. However, the same logic would not apply to introduced species such as domestic stock, willows and salmonids; anthropogenically altered landscapes; or the presence of man-made river features such as culverts, fords and bridges.

78. Regardless, the catchment is gorge-like in nature and much of the remainder is incised. Mr Trotter has identified that this may make the ecology of the catchment less sensitive to changes in flow[26]. Having

[26] Evidence of Mr M Trotter, paragraph 22

visited the catchment and viewed countless photographs through this deemed permit process, I am confident that the removal of roughly one third of the catchment's low flow water as primary allocation will not overly affect the natural character of the river at the catchment scale. Still, it must be noted that this conclusion is subjective.

Objective 6.4.7*: 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.*

79. Policy 6.4.7 discusses whether a residual flow may be considered to provide for aquatic and natural character values. Even with a minimum flow, it is important to consider this scale as an inappropriate amount of water could potentially be abstracted from one point of take even while inflows downstream may allow for the minimum flow to be met.

80. In its submission, Fish and Game sought residual flows for each of the takes. The reasoning for the requested residual flows was to ensure one branch is not dewatered with respect to the LIC takes and a combination of a theoretical split of water at low flows for the LMS Alice Burn and measurement error for LMS Alice Burn Tributary take[27]. The residual flows sought by Fish and Game have now either been adopted or exceeded by the applicants for all take points except the Alice Burn Tributary take, where no residual flow is proposed[28].

81. For the LIC takes, Mr Hickey describes the proposed residual flows (which includes a visual flow on the LIC North Branch take, as opposed to the 100l/s residual flow proposed in Ms Scott's proposed conditions) as providing for ecological values because it only affects 400m of stream reach, will occur for a limited time and juvenile trout will be able to migrate out of reaches constrained for habitat or food[29].

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[27] Otago Fish and Game Submission on RM18.345, paragraph 50–53

[28] Evidence of Ms Scott: Applicant Consent Conditions FINAL 09102019 Track Changes

[29] Evidence of Mr Hickey, paragraph 90

82. I would not consider these to be reasons why the proposed residuals provide for aquatic ecosystems. They're more reasons why the harm caused by abstraction may be mitigated somewhat by the geographic/temporal scale of the residual flow or outmigration of affected species. That juvenile trout may need to outmigrate strongly implies to me that the aquatic ecosystem is not provided for in this reach. I would characterise the LIC residual flows as being a way to mitigate against the worst impacts of the high allocations in the application – that being total dewatering of the reach.

83. Similarly, the photograph[30] of what a visual flow, gauged as 25l/s, may look like at the Alice Burn ford shows a stream that is depleted compared to what I imagine it would look like at naturalised flows (124l/s). In saying this, I must recognise that the ford is one of the few areas in the catchment where the river is not incised.

84. To what degree a visual flow "provides" for aquatic ecosystems or natural character is debatable. The quality of both factors would be best described on a scale with poor quality and good quality on each end. Therefore, a subjective assessment is required as to where along that scale each trait has been provided for. Given this, the application isn't necessarily inconsistent with Policy 6.4.7; however, I would be more comfortable with that conclusion if a higher residual were proposed.

85. There isn't a strong basis for the residual flow on the LMS Alice Burn take – this is stated by Fish and Game in its submission[31]. Nevertheless, I do feel a residual flow of at least 46l/s would be consistent with Policy 6.4.2. The reach is gorge-like in nature, which Mr Trotter describes as being less sensitive to changes in flow than other river reach types[32].

86. In terms of the residual flow for the Alice Burn Tributary, I understand that it is a perennial reach and so I would consider the ability to cause a disconnection due to abstraction to be a fundamental departure from the natural character of the stream – changing the character from perennial to intermittent. On this fundamental basis, a take on this reach

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[30] Combined s421A report: Appendix 8, section 4.5

[31] Otago Fish and Game Council Submission on RM18.345, paragraph 54

[32] Evidence of Mr M Trotter, paragraph 22

without a residual flow provision that enables at least a surface water connection to the Alice Burn cannot be consistent with Policy 6.4.7.

87. Considering the above discussion, there is a clear possibility for localised effects to be felt at the point of take but for the minimum flow and primary allocation limits to still be met. The visual flow approach sought by the applicant and Fish and Game on the LIC Alice Burn take represents protection from a worst case scenario of dewatering and it must be acknowledged that this doesn't necessarily meet the guidance of Policy 6.4.7. A higher residual flow would likely mean that aquatic ecosystems and natural character are better provided for, even if that is unquantified at this stage.

Objective 5.3.4: To maintain or enhance the amenity values associated with Otago's lakes and rivers and their margins.

Policy 5.4.9: *To have particular regard to the following qualities or characteristics of lakes and rivers, and their margins, when considering adverse effects on amenity values:*

(a) Aesthetic values associated with the lake or river; and

(b) Recreational opportunities provided by the lake or river, or its margins.

88. I am not aware of significant amenity values or recreation activities in the catchment, above SH6. However, I do note that a marginal strip follows the river from SH6 to the upper catchment, connecting to scenic reserves and conservation areas[33].

89. Fish and Game[34] and the s42A authors[35] describe the potential for salmonid recruitment from the Luggate catchment to support fisheries in the upper Clutha. The continued recreational opportunities and amenity value of these fisheries will be supported by the protection of

[33] Walking Access Commission. (n.d.). Walking Access Mapping Service. *Public access areas map*. Wellington: Walking Access Commission. Retrieved October 19, 2019, from https://www.wams.org.nz/PublicAccessAreas/

[34] Otago Fish and Game Council Submission on RM18.345, paragraphs 11-15

[35] Combined s42A report, section 6.2

salmonid spawning and rearing habitat in the Luggate. These considerations are discussed above and should be considered in the context of Policy 5.4.9.

Policy 6.4.0*: To recognise the hydrological characteristics of Otago's water resources, including behaviour and trends in:*

(a) The levels and flows of surface water bodies; and

(b) The levels and volumes of groundwater; and

(c) Any interrelationships between adjoining bodies of water, when managing the taking of water

90. Several experts have noted a wide variance in the estimates of modelled naturalised MALF[36,37], or that the historic flow statistics to support modelling are out of date and one off[38]. Given this, I am not confident that we do have a good handle on the hydrology of the catchment. Catchment characteristics can be discussed in broad terms, for example it appears that no experts have identified significant gaining or losing reaches, and there is a range of flows identified for naturalised MALF. However, I would not say that restricting discussion to broad terms is consistent with the intent of Policy 6.4.0, as described in the explanation and principal reasons for adoption sections of the RPW for this policy. I do note there is no guidance in the policy as to the quality of hydrological information required for the policy to be met, so technically a broad understanding of the catchment would be consistent with the policy wording.

Objective 5.3.6: To provide for the sustainable use and development of Otago's water bodies, and the beds and margins of Otago's lakes and rivers.

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[36] Evidence of Mr M Trotter, paragraph 14

[37] Evidence of Mr Hickey, paragraph 27

[38] s42A report: Appendix 4, page 2

Objective 6.3.2: To provide for the water needs of Otago's primary and secondary industries, and community domestic water supplies.

Objective 6.3.4: To maximise the opportunity for diverse consumptive uses of water which is available for taking.

Objective 6.3.3: To minimise conflict among those taking water.

Policy 5.4.12: To promote the establishment of, and support, appropriate water user groups to assist in the management of water resources

Policy 6.4.0A : To ensure that the quantity of water granted to take is no more than that required for the purpose of use taking into account:

(a) How local climate, soil, crop or pasture type and water availability affect the quantity of water required; and

(b) The efficiency of the proposed water transport, storage and application system.

91. The above objectives and policies relate to enabling the abstraction of water, through promoting collaboration between users and technical efficiency. I consider that this is largely achieved through the consent conditions proposed in the s42A report.

92. One key exception is Policy 6.4.0A(b). In response to Commissioners' questions, the s42A report authors' noted that the race system was not the most efficient system available but considered that requiring upgrades was not reasonable given the 10 year consent duration proposed[39]. I note that Fish and Game have requested that part of the race system be left unscreened to provide for salmonid spawning. If this were to be adopted in addition to requirements for improved efficiency in the unscreened sections of the race systems, there may be conflicts between the objectives.

93. Similarly, there are various RPW provisions covering water user groups and better use/monitoring of water 6.4.0B, 6.4.12A, 6.4.12B, 6.4.12C, 6.4.16, 6.6.1, 6.6.2, 6.6.3. I am confident that the conditions recommended in combined s42A report are consistent with these provisions.

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[39] s42A Authors' response to Questions, page 9

Policy 6.4.19*: When setting the duration of a resource consent to take and use water, to consider:*

(a) The duration of the purpose of use;

(b) The presence of a catchment minimum flow or aquifer restriction level;

(c) Climatic variability and consequent changes in local demand for water;

(d) The extent to which the risk of potentially significant, adverse effects arising from the activity may be adequately managed through review conditions;

(e) Conditions that allow for adaptive management of the take and use of water;

(f) The value of the investment in infrastructure; and

(g) Use of industry best practice.

94. Policy 6.4.19 outlines the considerations for term. I will go through each of the considerations one by one:

    l. **Purpose of use**: the uses identified include agriculture and urban housing. Both these uses do not appear to show any sign of halting within a 35 year window. It seems likely that both activities will exist in the catchment for a time greater than the duration of any consent for surface water abstraction.

    m. **Presence of a catchment minimum flow**: a minimum flow exists but it does not comply with the NPS-FM and will therefore need to be reviewed. I note that while the "presence of a minimum flow" is a binary test, consideration need not be. Therefore, I think it is reasonable to consider the appropriateness of the present minimum flow with respect to term.

    n. **Climatic variability**: Bodeker Scientific has prepared a report considering the impact of climate change on the Central Otago

Region[40]. In section 6.1 of this report, the authors suggest that: "*With many water permits across the district expiring in 2021, and the regional council reviewing minimum flows in rivers and streams, it will be important for the impact of evolving changes in the climate to be considered in water allocation decision-making*".

o. **Review conditions**: Above, I have discussed my concerns around the Policy CA1-CA4 process and implementing the outcomes by way of review without frustrating existing consents. This is particularly relevant to phasing out over-allocation. I would consider over-allocation to be a potentially significant adverse effect, albeit one which cannot be defined with the current RPW framework.

p. **Adaptive management conditions**: Adaptive management conditions may be developed to phase out allocation using a trigger point or over time. However, none have been proposed. Given the wide scope of the Policy CA1-CA4 process, it would be very difficult to develop an adaptive management condition that covers all the possible limits which may be imposed.

q. **The value of the investment in infrastructure**: this is similar to a consideration in RMA s104(2A). I agree with the s42A authors' response to Commissioners' questions in that this does not include consideration for raising finance for infrastructure development[41]. Even so, Mr Hickey has described the reliability of supply under the future flow regime as improving on the existing flow regime, and that this sufficient for LIC and LMS[42]. Therefore, I would expect the applicant will be enabled to continue the current operation for the duration of the consent, even if it were 10 rather than 35 years.

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[40] Cameron, C., Kremser, S., Lewis, J., Bodeker, G., & Conway, J. (2017). *The past, present and future climate of Central Otago: Implications for the district.* Alexandra: Bodeker Scientific.

[41] Question 19, page 11

[42] Evidence of Mr Hickey, paragraph 62

r. **Use of industry best practice**: I am not equipped to comment as to whether the application proposes activities which are industry best practice.

95. On balance, I believe setting the term no higher than 10 years is appropriate. There are benefits and costs to this conclusion which should be weighed up.

96. On the costs side, a shorter consent term will mean that the applicants will have a higher transaction cost for the same activity over a 35 year period, as they must apply for at least one more consent. A 35 year consent will surely give more certainty in operating a profitable business but it appears that existing infrastructure will be able to be operated and in some cases the reliability of supply may even be improved. I see no reason why future upgrades to infrastructure would be considered as part of the consideration in this policy.

97. On the benefits side, a 10 year consent would cease in 2031, 6 years after the notification of the RPW review to give effect to the NPS-FM. I consider this would be sufficient time to resolve hearing processes and develop a consent application. In addition, the recommendation by Bodeker Scientific suggests flexibility is desirable to respond to evolving climate change issues, which would be provided with a shorter consent. Given my concerns with adaptive management conditions and potentially frustrating consents upon review, I see no realistic alternative bar limiting term to provide the flexibility needed by these two factors.

RPS and pORPS

98. I agree with section 10.2 of the s42A report regarding the relevant provisions of the pRPS and pORPS and agree with the conclusions drawn by the authors with two exceptions – residual flows and term. The application does not propose a residual flow for the LMS Alice Burn Tributary take, and therefore I do not think it will maintain and enhance natural character and aquatic values. If a residual flow were set for this tributary and term were set as above, I would agree with the authors' conclusions.

99. I would also like to draw greater attention to pORPS Policy 5.4.3, referred to in the s42A report as Policy 4.4.3:

Policy 5.4.3*: Apply a precautionary approach to activities where adverse effects may be uncertain, not able to be determined, or poorly understood but are potentially significant.*

100. In the context of poorly understood hydrology, climate change and an incomplete policy framework that includes no definition of over-allocation, I consider that this is the right time to apply a precautionary approach. In this case I believe this is best applied in relation to consent term.

NPS-FM

101. The NPS-FM Objectives relevant to this application are:

Objective AA1*: To consider and recognise Te Mana o te Wai in the management of freshwater.*

102. The NPS-FM preamble discusses the concept of Te Mana o te Wai, summarising the concept as "… the integrated and holistic well-being of a freshwater body", and stating that upholding the concept "…acknowledges and protects the mauri of the water". It is broken down into the health of the environment, the health of the waterbody and the health of the people.

103. This objective was included in the NPS-FM after the RPW was written and after minimum flow for the catchment was set. The application suggests numerous times that adhering to the minimum flow will mitigate adverse effects on the environment. This does not automatically apply for Te Mana o Te Wai as it has not been previously considered.

104. At most points of take, the majority of the water at low flows will be available for abstraction, leaving only a portion for environmental function (or a 50/50 split for the LMS Alice Burn take). Mr Trotter has identified that this not a precautionary approach which may have adverse effects. Although, when considered without cumulative effects using the application flow regime, the allocation as a whole seems reasonable.

105. Regardless, the primary allocation has been calculated as what is required to service current irrigation demand. Fundamentally, this does not place the health of the environment, the water body or the people first. Instead the applicants' method of calculating primary allocation places primacy on abstraction demand.

Objective B1: *To safeguard the life-supporting capacity, ecosystem processes and indigenous species including their associated ecosystems of fresh water, in sustainably managing the taking, using, damming, or diverting of fresh water.*

106. As with the discussion in paragraph 41 and 42 of this evidence, when the application regime is considered at a catchment scale the allocation does seem reasonable. When the impacts are considered at each point of take, there is a considerable ability for abstraction to affect localised reaches. Residual flow conditions may mitigate this to some degree but, as with the discussion on RPW Policy 6.4.7 above, the visual flow conditions do not safeguard as much as protect against absolute worst case outcomes – being de-watering.

107. The lack of residual flow proposed on the LMS Alice Burn Tributary take and the high allocation means that the tributary can potentially be abstracted dry. This would not be consistent with Objective B1 for the reach downstream of that take.

Objective B2: *To avoid any further over-allocation of fresh water and phase out existing over-allocation.*

108. As discussed above, over-allocation is not defined in the RPW and until freshwater objectives are set for the catchment through a Policy CA1-CA4 process it cannot be properly defined in the NPS-FM either. Because of that, this objective in its entirety cannot possibly be met at this time.

109. In their response to Commissioners' question 743, the s42A report authors discuss a possible interpretation of Objective B2 as including a

[43] Question 7, page 11

temporal aspect to furthering over-allocation. This is a reasonable interpretation in my mind as the objective does not give guidance on whether "further over-allocation" should be measured by temporal, volume or rate of take measures. Any and all measures should be considered.

Objective B3: *To improve and maximise the efficient allocation and efficient use of water*

110. The application has compared the allocation requested to the Aqualinc efficiency requirements and the amount of water applied for is no more than has been used historically. In this sense there is efficiency of use.

111. In the NPS-FM, the term efficient allocation is defined as including economic, technical and dynamic efficiency. The guide to the NPS-FM[44], extrapolates upon these terms:

Efficient allocation may include (but is not limited to):

- *Economic efficiency (also known as allocative efficiency): allocating water to enable optimum economic outcomes (eg, allocating water to the uses which have the highest value to society and create headroom).*
- *Technical efficiency: maximising the proportion of water beneficially used in relation to that taken. It relates to the performance of a water use system, including avoiding water wastage.*
- *Dynamic efficiency: adjusting the use of water over time to maintain or achieve allocative efficiency (eg, enabling movement of allocated water and minimising the transaction costs for doing so)*

[44] Ministry for the Environment. (2017). *A Guide to the National Policy Statement for Freshwater Management 2014 (as amended 2017).* Wellington: Ministry for the Environment. Retrieved from https://www.mfe.govt.nz/sites/default/files/media/Fresh%20water/nps-fm-guide-2017-final.pdf

112. The discussion of efficiency above would best fit into the category of technical efficiency.W

113. It is very difficult to consider economic/allocative efficiency in a consenting sense. To do so would require applicants to consider all alternative water uses and determine their value to society. Some of those uses will not be in their best interest but may be best for society once externalities are considered. By grandfathering existing allocation using RPW Policy 6.4.2 and not defining over-allocation, the current policy framework does not assist the quest for allocative efficiency.

114. Dynamic efficiency could be addressed a number of ways. Firstly, by using consent conditions improving technical efficiency over the life of the consent. Secondly, by improving the efficiency of existing systems or re-allocating water to more efficient uses at the end of a consent term. The consent term proposed by the s42A report would enable the latter to occur over a reasonable timeframe.

Objective B5*: To enable communities to provide for their economic well-being, including productive economic opportunities, in sustainably managing fresh water quantity, within limits.*

115. This objective cannot be fully met until limits are set through the Policy CA1-CA4 process. However, it does appear that the application will provide for the economic well-being, especially the productive economic opportunities, of the applicants at least, if not the community.

116. In summary, the application as proposed by LIC and LMS is not consistent with some relevant objectives in the NPS-FM, particularly Objectives AA1, B1 (unless a residual flow is adopted on the LMS Alice Burn Tributary take) and B2. Parts of Objectives B3 and B5 are consistent with the application and Objective B4 is not relevant.

117. The RMA s104(1) test is “have regard to” and I believe the consent could still be granted, when considering all the relevant provisions. The NPS-FM objectives are the most up to date provisions in the policy framework and the regional policy documents are to give effect to them in due course. Failing to be consistent with NPS-FM objectives therefore is problematic; however, this may be mitigated by a precautionary and practical approach to term.

SFGMP

118. The Conservation Act (1987) requires Fish and Game Councils to prepare a sports fish and game management plan to "*establish objectives for the management of sports fish and game, or both, within any region or part of* any *region*"[45]. Fish and Game has prepared one for the Otago region, which has been operational since 2015. Within this plan, there are a number of provisions which are of relevance to this application:

Policy 6.4.14*: When advocating the Council's interest in habitats, undertake a holistic assessment of the catchments ecosystem values and needs*

Policy 6.4.18*: To ensure that water quality standards and flow regimes reflect the requirements of healthy and productive sports fish and game populations and the different stages in their life cycles*

Policy 6.4.19*: Place a priority on resolving over allocation issues in Central Otago rivers relating to deemed permits in order to restore habitats for sports fish. The potential of on-farm water storage should be considered in resolving over-allocation issues.*

119. With no more than a 10 year term and at least the addition of a residual flow on the LMS Alice Burn Tributary take, the application would meet these policies. Without a definition of over-allocation, it is impossible to resolve it in this process; however, a term that can work into the future policy development on this issue is crucial to enabling resolution in future if necessary.

120. In regard to Policy 6.4.14, I have discussed the inclusion of longfin eel habitat in my policy consideration and the need for a residual flow in the LMS Alice Burn Tributary, despite no sports fish being present. Mr Trotter considers re-introduction of eels into the catchment in his

[45] Conservation Act (1987) s17L(1)

evidence and concludes that diverse habitat may be able to sustain both trout and eel populations[46].

KTONRM

121. There are provisions in the planning framework which discuss Kāi Tahu needs and aspirations. Not being part of Kāi Tahu, or privy to their decision making processes, I'm reluctant to comment on matters outside of Te Mana o te Wai (as it is fundamental to the NPS-FM). However, I would like to draw attention to provisions in the KTONRM relating to introduced species and mahika kai.

5.5.2 Mahika kai and biodiversity general issues*: Introduced species have displaced or interbred with indigenous mahika kai species, but customary rights to take introduced species are often disregarded.*

5.5.4 Mahika kai and biodiversity general policies: *To require Kāi Tahu ki Otago participation in the management of mahika kai, both introduced and indigenous.*

122. These provisions clearly create a link between mahika kai with introduced species. What introduced species could be considered as mahika kai is left open and therefore may include salmonids.

123. The relevance of these provisions to the application is that salmonids may be considered a mahika kai species and therefore would be subject to a raft of mahika kai related policy provisions. Often salmonids are considered as worthy of protection due to their inclusion in RMA s7(h), or because of environmental values or recreational values identified by the community. Other parts of the community view salmonids as undesirable. These provisions add another dimension to the complex perspectives of salmonids in Otago.

Races, by-wash and fish screens

[46] Evidence of Mr M Trotter, paragraph 25

124. I wish to now discuss the race infrastructure and fish screens on the two LIC takes.

125. In its submission, Fish and Game identified that the LIC Alice Burn take race provides spawning habitat which has been used by wild spawning trout and that the current setup with a steep by-wash and no fish screen has likely been causing harm[47]. Mr Kelly describes the steps that have been taken by the applicants to address these concerns, including discussing proposed conditions by Fish and Game[48]. These had broad agreement from DoC and Aukaha. However, the conditions were sent on a without prejudice basis, so no party should be held accountable to them.

126. I will instead focus on the applicants' proposed consent conditions for fish screens[49]. These set requirements on mesh/slot size, approach velocity, sweep velocity, reporting prior to installation and ensure that the screen is maintained in working order. However, compared to the recommendations in the document Fish screening: good practice guidelines for Canterbury50, the design requirements do not include the following recommendations: a suitable fish bypass with connectivity to somewhere safe and a smooth surface on the screen material to prevent damage to fish.

127. The effects of screening in this case are multi-layered. In the existing environment flow regime, no abstraction would be occurring and therefore there can be no habitat in those races for wild spawning to occur. As such, spawning in LIC races would not form part of the existing environment and the provision of spawning habitat via abstraction would be a positive effect. Simultaneously, any harm that aquatic life may

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[47] Otago Fish and Game Council Submission on RM18.345, paragraphs 60-66

[48] Evidence of Mr Kelly, paragraphs 51-52

[49] Evidence of Ms Scott: Applicant Consent Conditions FINAL 09102019 Track Changes, LIC consent conditions 10-11

[50] Jamieson, D., Bonnett, M., Jellyman, D., & Unwin, M. (2007). *Fish screening: good practice guidelines for Canterbury.* Christcurch: NIWA. Retrieved from https://www.doc.govt.nz/Documents/conservation/native-animals/Fish/fish-passage/fish-screen-guidelines.pdf

come to by being in races, such as being sucked into irrigation infrastructure, or harm caused by race management, such as de-watering races and sediment or vegetation clearance, would be an adverse effect of the activity.

128. Those adverse effects can be avoided with the addition of effective and non-harmful fish screening and by-wash devices, following the recommendations of *Fish screening: good practice guidelines for Canterbury,* and inclusion of conditions regulating race management. This would make this part of the application consistent with the policy framework I have discussed in the above sections.

129. The following additions or alterations to the applicants' proposed conditions could achieve this outcome. Some of the conditions I am proposing below are the same as Fish and Game put to the applicants in July, others are alterations (in red underlined text) of the applicants' proposed conditions.

    a. A fish screen must be designed and installed that meets the following requirements:

        i. Water must only be taken when a fish screen with a mesh size of maximum slot width of 3mm and a smooth surface is operated and maintained across the full width of the intake to ensure that fish and fish fry are prevented from passing through the intake screen; and

        ii. As far as possible, the screen area must be designed to ensure the calculated average through screen velocity does not exceed 0.12 m/s if a self-cleaning mechanism is in place, or 0.06 m/s if no self-cleaning mechanism is in place.

        iii. If a bypass is required, fish are taken away from the intake and put back to the source channel or into water which provides the fish with unimpeded passage back into the source channel.

        iv. The sweep velocity parallel to the face of the screen must exceed the design approach velocity.

    Prior to installation of any fish screen, a report containing final design plans and illustrating how the screen will meet the

required design criteria and an operation and maintenance plan should be provided to the Consent Authority.

b. All unscreened sections of the race will not be converted to pipe during the duration of the consent.

c. A minimum of 15cm depth is always maintained in all unscreened sections of the races, except for planned and emergency works.

d. With the exception of emergency works, the following activities in unscreened sections of the races will only be undertaken in the period from 1 January to 31 March (inclusive) of each calendar year:

v. dewatering the race below 15cm in depth;

vi. mechanical substrate removal; and

vii. mechanical vegetation removal instream or on the race banks.

e. The Otago Fish and Game Council [and other parties as required] will be notified of the nature, scale and duration of works carried out in condition 3 at least 5 working days prior to work commencing, or as soon as is practical for emergency works.

130. Finally, it has been drawn to my attention that the fish screen system proposed may be reliant on a diversion of water which is not applied for in the consent and would therefore be inconsistent with RMA s14(1). My understanding is that the by-wash provides a sweep velocity, so that fish are not impinged on the screen. Therefore, some water will need to be taken from the main stem, washed down the race and put back into the stream via the by-wash, prior to being metered. If the water used for the by-wash is not considered to be part of the allocation sought by the applicants, then I would agree that it would be a diversion.

131. This is wider problem than just for this consent. I understand that most fish screens will require a by-wash to generate a sweep velocity. This would constitute a diversion, whether water was diverted for 10 meters or 100 meters. Unfortunately, I don't have a solution to this problem and it would arise as long as a by-wash is used.

DATED this 20th day of October 2019

Nigel Paragreen

Otago Fish and Game Council