

**BEFORE THE INDEPENDENT HEARING PANEL  
APPOINTED BY HAWKE'S BAY REGIONAL COUNCIL**

**IN THE MATTER** of the Resource Management Act 1991

**AND**

**IN THE MATTER** of the hearing of  
submissions on Proposed Plan Change 9  
(PPC9) – Tūtaekurī, Ahuriri, Ngaruroro and  
Karamū Catchments (TANK)

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**EVIDENCE OF MARK APATU  
FOR APATU FARMS LTD**

**9 JUNE 2021**

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## **INTRODUCTION**

1. My name is Mark Apatu
2. Together with my brother Paul we own and operate Apatu Farms Ltd. It is a second generation horticultural business farming 1500 hectares of irrigated land on the Heretaunga Plains. The company has a permanent staff of 65, increasing to a seasonal total of 250.
3. Apatu Farms business relies on high quality soils, warm dry summers and the ability to efficiently supplement and irrigate crops with water.
4. We have developed systems that have proven our ability to deliver high quality consistent and reliable product. Our customers demand sustainability and strict environmental protocols, of which we are audited annually to ensure we meet internationally recognized standards. Our goal is safe and sustainable food and beverage production to benefit community, and consumers.

### **Apatu Farms Ltd Stated Position**

5. I generally support the overall framework of Plan Change 9, to the degree that it reflects a staged approach to improving the management of the TANK Catchments freshwater resources.
6. Horticulture is critically important to the future sustainability of the TANK Catchments, and there are some changes required to the proposed plan to ensure that sufficient water is available to provide for that. The value of horticulture and its role in providing for domestic food supply and security, and the ability to feed people in the future is not currently reflected in the proposed Plan Change 9.

### **Signature of submitter:**

Mark Apatu  
Director  
Apatu Farms Limited

**Date:** 9 June 2021

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## Introduction

My expert evidence addressed the following key matters:

- Actual and reasonable use
- Permit transfer
- Nutrient (nitrogen) loss thresholds
- Tūtaekurī River minimum flow

The Addendum Report to the Hearing Report recommends changes to the definition of actual and reasonable use, to the Rules relating to permit transfer, to the rules and Schedule relating to nutrient loss and to Schedule 31.

### **Policy 36, 46, 52; TANK 9, 10 and 11; Schedule 31; and the Glossary of Terms – “Actual and Reasonable”**

In my expert evidence I recognised that HBRC had amended the date to refer to calculation of the average water use data to be the 10-year period preceding 2 May 2020. I support this change.

In my evidence I presented examples using data for two Apatu Farms properties that had 8-9 years of accurate water meter data. Allocating use as the average (rather than the maximum) would severely compromise the ability of not only Apatu Farms but other irrigators to meet crop demand, especially in a drier years (greater than about the 60<sup>th</sup>-percentile demand season).

I consider that all water meter data (if more than ten years is available and is accurate) should be used in the calculation of use. Just because 2010-11 to 2019-20 captures two seasons that are close to the 95<sup>th</sup>-percentile demand season, additional data should not be excluded. An individual permit holder may have a use pattern that may not be captured in the 10-year period. The pattern of use may not be typical of an empirical analysis of climate data (Irricalc or other daily water balance modelling). The analysis of Kozyniak used to justify the 10-year period is for rainfall only – she **does not** model irrigation demand.

A permit holder's record should be able to be used regardless of length, so long as the water meter record meets the water meter quality standards.

### **Transfer of Water Permits**

I support the transfer of water permits to another location in the same aquifer or Water Quantity Area.

In my expert evidence I reasoned that any permit to take groundwater is already included in the interim limit and that is “part” of the existing environment. A transfer should be enabled so long as well interference effects are less than minor or can be mitigated at the new location and any nutrient losses are no greater than from the current location.

The rules regarding transfer (RRMP 62a and 62b) are controlled and discretionary activities respectively. The condition of RRMP Rule 62a (f) states that:

The transfer does not result in an increase in nitrogen loss exceeding the amounts specified in Table 2 in Schedule 29.

I note that the Council officers have recommended that Table 2 of Schedule 29 be deleted. I suggest this condition should be amended to say:

The transfer does not result in an increase in nitrogen loss greater than 10% (as recommended by the Council officers).

**Nutrient loss - TANK 6 (and Schedule 29)**

HBRC reporting officers have recommended “an amendment is required in TANK 6 so that all land use change is not captured inadvertently”. I support an amendment for the reasons I set out in paragraphs 37-39 of my evidence.

While further changes have been recommended to Table 1 in Schedule 29 I consider Schedule 29 is still subjective and note it deals **only** with N leaching.

The new condition in TANK Rule 5 “The change in modelled average annual N loss as a result of the land use change is less than 10% (using Overseer or an alternative nutrient budget model approved by the HBRC)” essentially makes Schedule 29 redundant because a permit holder can change land use if they can demonstrate that the N loss change is less than 10%. This removes any subjective categorisation of land use activity(ies).

While the officers recommendation (10% limit) is a move in the right direction, it should specify a time-period to determine the current land use nutrient loss against which the change in land use loss can be compared. I suggest the current land use loss should be the average annual N loss for the preceding 5 years.

I do not support the retention of Schedule 29 Table 1.

I support the 10% threshold of change for land use change.

**Schedule 31**

HBRC reporting officers have recommended raising the Tūtaekurī River minimum flow from 2000L/s to 2500L/s. In my expert evidence I showed the analysis of the mean daily flow would not result in an irrigation ban, regardless of whether the minimum was 2000L/s to 2500L/s. For the reasons set out in paragraphs 52-54 I considered raising the minimum flow to 2500L/s could jeopardise the investment in pip fruit in the lower Tūtaekurī catchment.

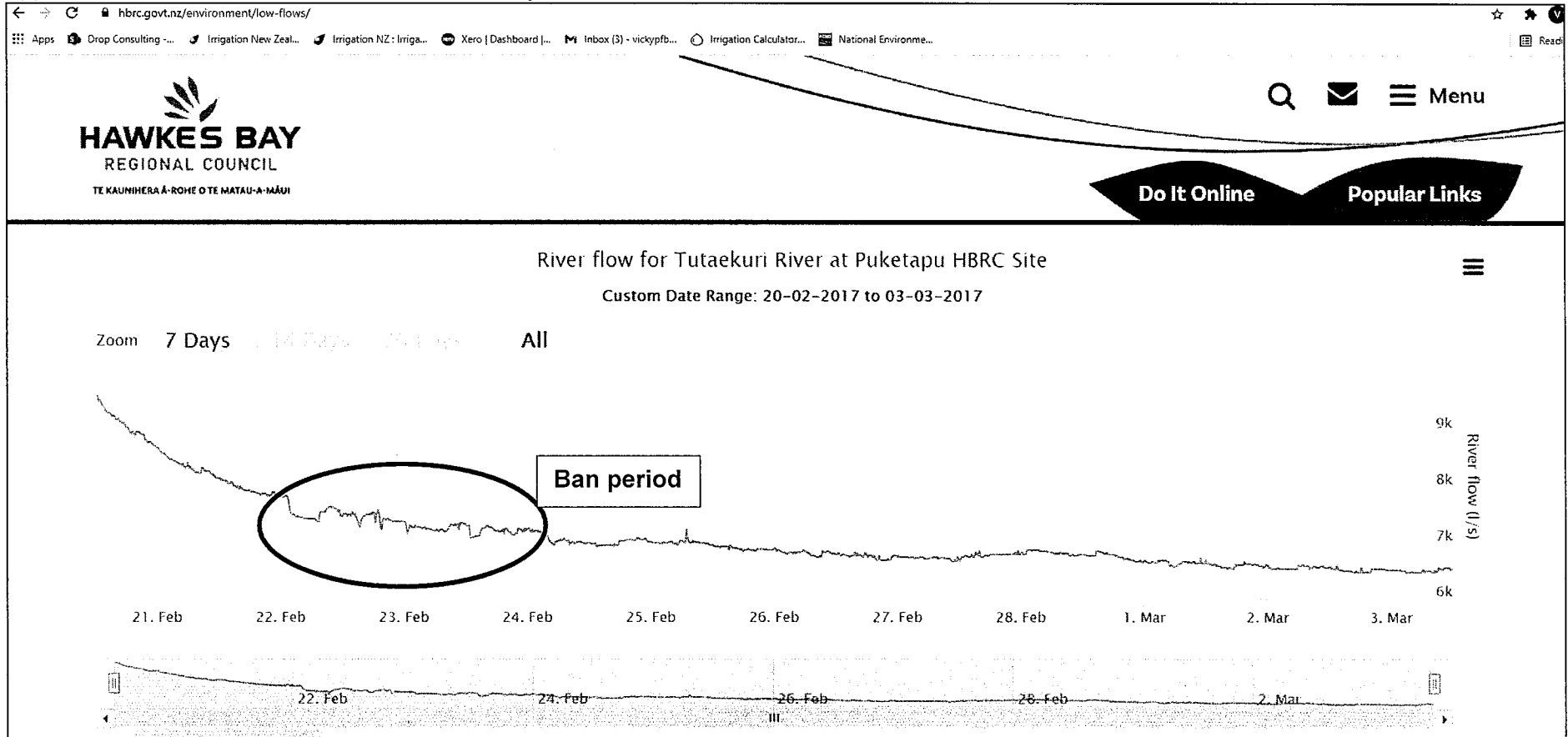
My further evidence for Heinz Wattie shows inconsistencies in the data streams for the Tūtaekurī River:

Firstly an irrigation ban from 22 to 24 February 2017, at a time when the minimum flow in the Tutaekuri River was 2,000 L/s, does not occur in my analysis of the mean daily flow record or the data on the HBRC <https://www.hbrc.govt.nz/environment/low-flows/> (Appendix 1). This ban lasted 3 days the mean daily flow record should show flow below 2000L/s – it does not, the flow was greater than 7000L/s and the ban was unnecessary.

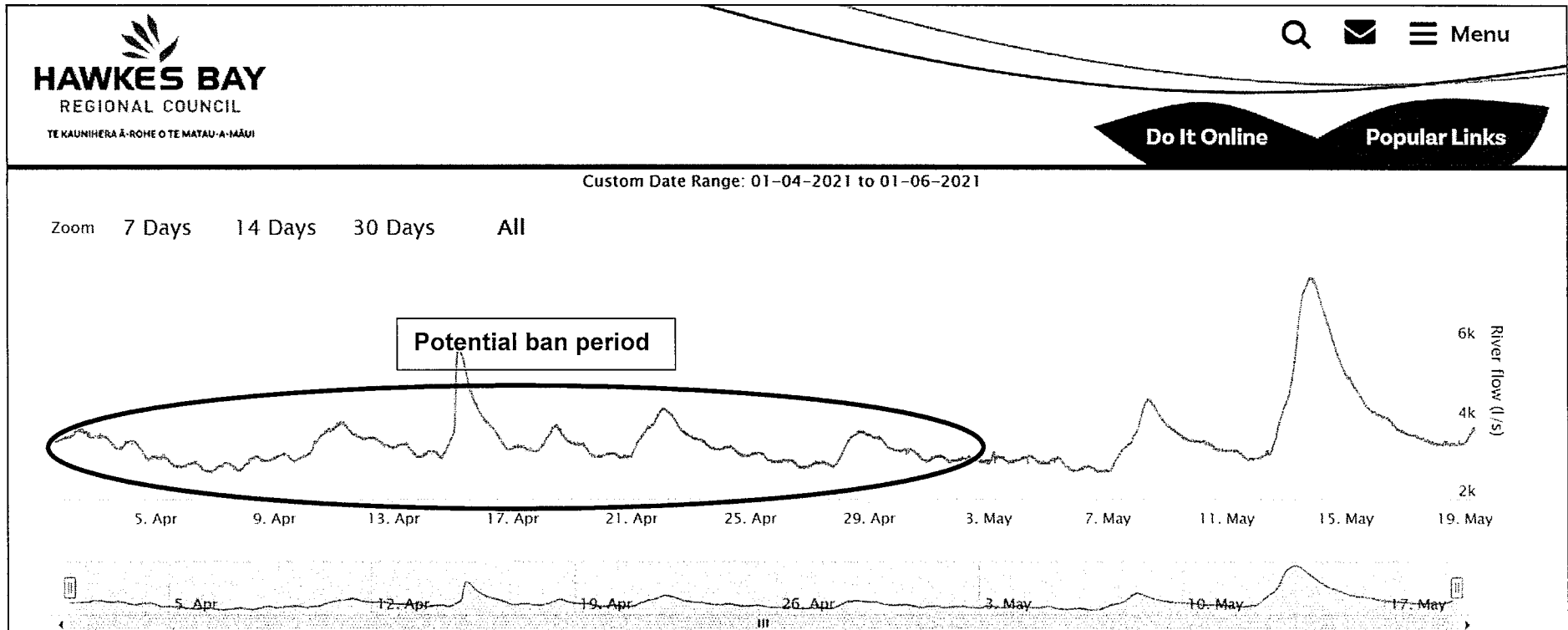
Secondly the raw telemetered data for the period 19 April to 7 May 2021(Appendix of my further evidence) showed the flow had fallen below 2500 L/s and potentially an irrigation ban would have been triggered. HBRC confirmed the instantaneous flow data “will change over time as data gets processed” and the processed data (Appendix 2) confirms the processed data changed and did not fall below 2500L/s.

In my opinion it is highly inappropriate from a resource management perspective for permit holders to have an irrigation ban imposed based on unprocessed data only to find that once it has been “processed” by HBRC the flow had not triggered the minimum flow restriction and so in hindsight the irrigation ban was unnecessary.

Appendix 1. Tūtaekurī River flow record February 2017



Appendix 2. Tūtaekurī River flow record April-May 2021





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Proposed Plan Change 9 (PPC9)  
– Tūtaekurī, Ahuriri, Ngaruroro  
and Karamū Catchments (TANK)

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**EVIDENCE OF ANTHONY DAVOREN  
FOR APATU FARMS LTD**

**11 MAY 2021**

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## **INTRODUCTION**

### **Qualifications and Experience**

1. My name is Anthony Davoren.
2. I am currently a private consultant to applicants and submitters as an expert witness, orchard management companies, consulting companies and grower co-operatives (e.g. Zespri). Prior to my current position I was employed as an Irrigation Management Consultant, Aqualinc Research Ltd. I owned HydroServices Ltd, a company specialising in soil moisture measurement and irrigation management from 1983 to 2016.
3. I hold a Bachelor and Masters (1<sup>st</sup> Class) in Science from University of Waikato, majoring in Earth Sciences; and a PhD in Engineering Science from Washington State University.
4. I have 38 years professional experience measuring soil moisture, irrigation management and acting as an expert witness at resource consent hearings. I have been an expert witness at resource consent and Environment Court hearings for:
  - 4.1. Canterbury Groundwater Zones;
  - 4.2. Irrigation of industrial and urban wastewater hearings for Canterbury Meat Packers and Selwyn District Council (Leeston);
  - 4.3. Selwyn District Council Rolleston urban wastewater discharge (resource consent hearing only);
  - 4.4. Manawatu District Council for the Feilding wastewater treatment plant discharge consent;
  - 4.5. Southland District Council in respect of the Te Anau wastewater discharge consent;
  - 4.6. Ngaruroro Water Conservation Order; and
  - 4.7. Otago Regional Council Plan Change 7.

### **Code of Conduct**

5. While this is not a hearing before the Environment Court I confirm that I have read the Code of Conduct for Expert Witnesses in the Environment Court Practice Note. This evidence has been prepared in accordance with the Code and I agree to comply with it. I confirm that the evidence and opinions I have expressed in my evidence are within

my areas of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

### **Scope and purpose of evidence**

6. My evidence addresses the following matters:
  - 6.1. Policy 36, 37, 46, 52; TANK 9, 10 and 11; Schedule 31; and the Glossary of Terms regarding replacement consents and, actual and reasonable use.
  - 6.2. Policy 54, 55,56, 57; TANK 13, 14, 15; and Schedule 32 regarding high flow takes and storage.
  - 6.3. Policy 51, 52; TANK 7 and 8 regarding availability of water for survival of permanent crops.
  - 6.4. Policy 48, 52; RRMP 61, 62, 62a and 62b regarding transfers of water permits.
  - 6.5. Policy 37 and 38 regarding restriction on re-allocation of water.
  - 6.6. Policy 17, 18, 19, 23, 24, TANK 1 and 2; Schedule 28, 30; and the Glossary of Terms regarding industry programmes and landowner collectives.
  - 6.7. Policy 21, TANK 5 and 6; and Schedule 26, 27 and 29 regarding land use change and nutrient loss.
  - 6.8. Schedule 31 regarding flows, levels and allocation limits.
7. In preparing this evidence I have relied on the following reports and presentations prepared for the TANK process, and:
  - 7.1. Hearing Report on Proposed Plan Change 9 (including Appendices) - Tūtaekurī Ahuriri Ngaruroro Karamū Catchment Area. Hawke's Bay Regional Council Publication No.5550, 15 April 2021.
  - 7.2. Proposed Plan Change 9 Tūtaekurī, Ahuriri, Ngaruroro and Karamū Catchment, Publication Number: 5456, Notification date: 2 May 2020.
  - 7.3. Ngaruroro and Tūtaekurī flow data from HBRC.
  - 7.4. TANK presentation reports of 22 March 2017, 27 July 2017, 2 August 2017 and 14-15 August 2018.
  - 7.5. Affidavit of Jeffrey Cameron Smith to the Special Tribunal for the Ngaruroro and Clive Rivers Water Conservation Order.

- 7.6. Hawke's Bay Regional Council Section 32 Evaluation Report March 2020. TANK Catchments Plan Change to Regional Resource Management Plan – Change 9.

#### **Apatu Farms Ltd Stated Position**

8. Apatu Farms Ltd (AFL) submitted in support of the overall framework of Plan Change 9 (PC9) and sought amendments to ensure future sustainability of the TANK catchments and horticulture which critically important to the region.
9. AFL consider changes are required to ensure there is sufficient reliable water to provide for this sustainability.
10. AFL recognises that “real freshwater improvements” are delivered through their farming practices, especially their water use and discharge management. AFL supports the requirement for “all growers to operate at best management practice.”

#### **Policy 36, 46, 52; TANK 9, 10 and 11; Schedule 31; and the Glossary of Terms**

11. AFL disagreed with the date for determining use of August 2017 and the definition of Actual land Reasonable.
12. HBRC has amended the date to define the 10-year period of water use data to the period preceding 2 May 2020.
13. I agree with the amended date but do not agree that the period of record should be restricted to 10 years. Statistically, the longer the period the more robust the analysis. AFL consider if there is a longer length of water meter use data than 10 years prior to 2 May 2020 then it should be used.
14. A longer length of record is also more likely to capture higher irrigation demand seasons and better define the 95<sup>th</sup> percentile (95 percent reliability of supply) demand season HBRC proposes<sup>1</sup>.
15. I disagree with the amended meaning for Actual and Reasonable (b) in Chapter 9, Glossary of Terms Used; i.e. “the average annual amount as measured by accurate water meter data in the ten years preceding 2 May 2020 if accurate water meter data is available. (If insufficient or no accurate data is available either clause a) or c) will apply”.

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<sup>1</sup> Appendix 1: Recommended Changes to Proposed Plan Change 9 - Tūtaekurī Ahuriri Ngaruroro Karamū Catchment Area, Glossary of Terms Used, Paragraph c) page 90.

16. The average amount (volume) used will not capture the irrigation demand season to meet the 95% reliability of supply (Paragraph (c) of the Actual and Reasonable meaning).
17. I demonstrate this with data from two AFL properties with 6 years of accurate water meter data (Table 1, Appendix 1). The analysis shows:
- Example 1 the average volume is 315,792m<sup>3</sup>, the 95<sup>th</sup>-percentile demand is 406,081m<sup>3</sup> and if the definition of Actual and Reasonable (as recommended by Council officers) is applied only 78% of the volume required in the 95%-ile season would be allocated.
  - Example 2 the average volume is 557,574m<sup>3</sup>, the 95<sup>th</sup>-percentile demand is 700,884m<sup>3</sup> and if the definition of Actual and Reasonable (as recommended by Council officers) is applied was applied only 80% of the volume required in the 95%-ile season would be allocated.

Year	Example 1	Example 2
	Volume m <sup>3</sup>	Volume m <sup>3</sup>
<b>2012-13</b>	419922	
<b>2013-14</b>	346511	522977
<b>2014-15</b>	381079	578228
<b>2015-16</b>	385320	704355
<b>2016-17</b>	279310	500732
<b>2017-18</b>	264371	534608
<b>2018-19</b>	194870	334899
<b>2019-20</b>	289088	693865
<b>2020-21</b>	281653	590930
<b>Mean</b>	315792	557574
<b>95%-ile</b>	406081	700684
<b>Proportion (95<sup>th</sup>-%ile/mean)</b>	0.78	0.80

Table 1. Annual volume m<sup>3</sup> used in the water years (1 July to following 30 June) for two AFL arable properties.

18. While allocating the average use might be consistent with Policy TANK 37(d)(ii)], it is not consistent with Policy TANK 47(d) or the definition in “Actual and Reasonable” allocating water for irrigation with a “95% reliability of supply”.
19. I have run an Irricalc model at Bridge Pa (close the to the AFL properties) for the seasons 2010-11 to 2019-20 to determine the 95<sup>th</sup>-percentile irrigation demand season (Appendix 2).
20. The 95<sup>th</sup>-percentile or 95% reliability of supply season demand is 570mm/year (5740m<sup>3</sup>/ha/year). The 2012-13 season was the highest

demand season and the percentile is greater than 95%. The 2018-19 demand (540mm/year) was less than the 95<sup>th</sup>-percentile demand but still exceeded the mean for the period of record of 465mm/year.

21. Allocating the average use will severely compromise the ability of irrigators to meet crop demand.

**Policy 54, 55, 56 and 57; TANK 13, 14 and 15; and Schedule 32**

22. AFL submitted for the high flow allocations to be revisited and considered the allocations to be interim.
23. I support the hydrological evidence of Ms Gillian Holmes for HortNZ that deals with these limits. That is, if future hydrological investigations demonstrate that a higher allocation(s) does not result in adverse effects, the limit(s) should be reconsidered.

**Policy 51 and 52; TANK 7 and 8**

24. AFL submitted a specific exemption to allow up to 20m<sup>3</sup>/day should be provided for in TANK 7 and 8 for survival of permanent horticultural crops.
25. Policy 51(d) references “water essential for survival of horticultural tree crops” but only “to make decisions about providing for water uses”. Neither TANK 7 nor TANK 8 specify the allowance of 20m<sup>3</sup>/day for a property. TANK 8 only refers to the “taking of water for non-consumptive uses including aquifer testing is limited to 20 cubic metres per day”.

**Policy 48, 52; RRMP 61, 62, 62a and 62b; and**

**Policy 37 and 38**

26. I disagree that enabling the transfer of water permits should not be permitted.
27. I support the transfer of groundwater and surface water permits that have been exercised. Key to the transfer is the interim allocation limit of 90Mm<sup>3</sup> per year and actual use which is likely less than the allocation.
28. Any permit to take and use groundwater is already included in the interim limit and the “environment”. Transferring the permit elsewhere in the Heretaunga Plains Aquifer area should be enabled so long as:
- a) Well interference effects are less than minor or can be mitigated (reduce the rate of take or volume); and
  - b) Any nutrient losses are no greater than from the current location.

29. This is no different to the trade and transfer of water permits in fully allocated groundwater zones in Canterbury where interference effects must be assessed and mitigated, and nutrient limits must be met.
30. While the allocation limit is interim “until there has been a review of the relevant allocation limits within this plan<sup>2</sup>” and is to be managed as an over-allocation, there are uncertainties with the allocation limit, the review and the over-allocation status. Water meter use analysis would demonstrate whether this limit is realistic, and if it is exceeded by use and in which years.
31. The 90Mm<sup>3</sup>/year limit is considered to be the approximate abstraction for municipal, industrial and irrigation use according to Smith (2017)<sup>3</sup> in his affidavit and was assessed in the s32 Report<sup>4</sup> as use in the summer of 2012–13 water year<sup>5</sup>. Based on this, 90Mm<sup>3</sup> has been set as the allocation limit.
32. The s32 Report estimates actual total use is 78Mm<sup>3</sup>/year or approximately about 48% of the (paper) allocation of 163Mm<sup>3</sup>/year. The estimated use of 48% is similar to an analysis of AFL and Heinz Watties (presented in their expert witness evidence<sup>6</sup>) water meter data use as a proportion of annual allocation is 41%. This suggests the actual irrigation use could be as low as 67Mm<sup>3</sup>/year and total use about 78Mm<sup>3</sup>/year; i.e. groundwater may not be over allocated
33. There is no proposal as to when the review might take place and be completed. While Policy 42 requires the council to commence a review after water has been re-allocated and consents reviewed and within 10 years of the operative date, I consider this is too long and there needs to be greater certainty of the completion date.
34. Policy 37(b) appears to be contrary to TANK Rules 9 and 10 under Section 124 rights. As stated, “avoid re-allocation of water . . . “would prevent the first consents which expire from being re-granted because the allocation limit would still be exceeded based on the current paper allocation being in excess of the interim limit.
35. I do not believe this is the intent of the Council and if it is not their intent the wording should be amended.

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<sup>2</sup> Appendix 1: Recommended Changes to Proposed Plan Change 9 - Tūtaekurī Ahuriri Ngaruroro Karamū Catchment Area, Policy 37, page 24.

<sup>3</sup> Affidavit of Jeffery Cameron Smith, 27 February 2017 for Special Tribunal for the Ngaruroro and Clive Rivers Water Conservation Order.

<sup>4</sup> Mitchell Daysh Report for Hawke’s Bay Regional Council Section 32 Evaluation Report March 2020. TANK Catchments Plan Change to Regional Resource Management Plan – Change 9.

<sup>5</sup> Hawke’s Bay Regional Council Section 32 Evaluation Report March 2020. TANK Catchments Plan Change to Regional Resource Management Plan – Change 9.

<sup>6</sup> Evidence of Anthony Davoren for Heinz Watties, 7 May 2021

**Policy 21; TANK 5 and 6; and Schedules 28 and 29**

36. AFL submitted that clarification of a change in land use and the nutrient provisions was required.
37. I do not support the changes made to Schedule 29 in the inclusion of Table 1: Land Use Types and Nitrogen Leaching Risk. This is a new table that defines land use types and the nitrogen leaching risk. It is not an improvement and is not a sensible or robust alternative.
38. Schedule 29 is highly subjective, does not consider differences in farm systems within any risk category, does not encourage mitigation measures to reduce nutrient leaching, and assumes all farm systems in a particular risk category have the same leaching and loss and risk of leaching.
39. Schedule 29 addresses only N leaching risk. Many enterprises (for example hill country sheep and beef or deer) will have a much greater risk of P loss than N.
40. Each Level assumes every farming enterprise in the Land use type will have the same or fall within a range of unspecified nutrient loss. This is not the case. Every enterprise in a category will have a different nutrient loss depending on soil type, topography and farming systems. An enterprise may then have a lower level of risk than categorised or may have a greater level of risk. Without any limits an enterprise will not know which category their operation fits.
41. I am not aware of and consider it is unlikely an enterprise is solely “intensive winter grazing”. It is more likely that an area of winter forage crop(s) forms part of a farming enterprise.
42. To consider dairy and arable to have the same leaching risk is not correct and is not supported by any nutrient modelling. My experience from Overseer modelling is that dairy will in most every location has a higher N loss than arable.
43. Any land that is irrigated is identified as the highest N leaching risk. This is not correct and in my experience horticulture, even if irrigated, generally leaches less Nitrogen than many of the listed ‘higher risk’ land uses.
44. TANK 6 is contingent on the outcome of the test for TANK 5(a) which states “A change in land use types means a change from one leaching level to a higher leaching level as shown in Table 1 of Schedule 29”. The Schedule will be easily contested with nutrient modelling and result in protracted debate that an applicant has not met the condition(s) or standard(s) of Table 1.



45. TANK 5 provides that a change of land use from (say) a low leaching activity to a higher leaching activity requires consent as a controlled activity. TANK 6 applies if the activity does not meet the conditions of TANK 5 – so it captures land uses that go from high leaching (e.g. dairy) to low leaching (e.g. arable) because that would not meet TANK 5(a). Restricted discretionary consent would be required.
46. I do not think that was what was intended. The only sensible reason for defaulting from Rule 5 to Rule 6 would be if the landowner does not comply with condition (d) of Rule 5 – i.e. is not a member of a Catchment Collective. More likely AFL would amalgamate their permits in a catchment and this does not appear to be an option.
47. Quite apart from that, unless Schedule 29 is changed to something more meaningful and certain, it:
- 47.1. will be easily contested with nutrient modelling; and
- 47.2. will result in protracted debate about whether an applicant has not met the condition(s) or standard(s) and so which activity status applies.
48. Schedule 29 should at the very least, given the objective is to manage nutrient loss to water, directly address nutrient limits and targets. For example:
- A farming enterprise(s) must achieve a reduction of nitrogen or phosphorous loss (e.g. 10% or 15%) from a good management baseline as determined by OverseerFM (or other approved model) by “2025”.
  - Such an approach would firstly provide knowledge of the potential (N and/or P) loss and secondly give HBRC time to develop nutrient limits for catchments and sub-catchments. This would put an onus on both the enterprise(s) to “know” their impact and demonstrate improvement, and the council to improve their monitoring of surface and ground water to inform the establishment of limits.
  - The recent Mayfield Hinds Valetta Irrigation Scheme consent application decision<sup>7</sup> (Appendix 3) provides an example of such an approach;
- “This consent is granted on the basis that the significant adverse effects on the receiving water will be reduced and there will be measurable environmental improvements” and “also gives the Applicant (substitute farming enterprise) sufficient time to

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<sup>7</sup> Mayfield Hinds Valetta Irrigation Scheme consent application decision, 21 April 2021.

demonstrate that land use practices can change to significantly reduce nutrient inputs and to address environmental degradation”.

And the decision sets nutrient loss reductions to be achieved by 2025 and 2030.

49. Freshwater Farm Plans (FFP) are outlined in Schedule 30 and are to be completed 3, 6 or 9 years after the Plan’s operative date. A key component of the FFP is a nutrient budget. However, there are no on-farm limits or targets to provide growers with certainty and clarity they are meeting any Plan requirement.

### **Schedule 31**

50. AFL submitted there be no increase to minimum flow in the Tūtaekurī River from 2000L/s to 2500L/s because of the “catastrophic impact on production” of potential irrigation bans.
51. I agree the increase in minimum flow in the Tūtaekurī River may not result in ban days that could affect irrigation takes. An analysis of the Tūtaekurī mean daily flow record 2009-21 shows there would have been no ban days if the minimum flow had been 2500L/s (Appendix 4).
52. Recent (2020 and 2021) low flows are very close to the proposed minimum flow and irrigation bans. I am aware there has been increased change in land use from grapes to pip fruit in the lower Tūtaekurī catchment. Much of this development has yet to reach full maturity. Water use is greater for pip fruit than grapes and maximum water use at maturity may result in increased abstraction. There is potential for this increase to hasten the minimum flow of 2500L/s being reached resulting in irrigation bans that have previously not occurred.
53. The low flow fell to 2667L/s in 2020 and again in April 2021, suggesting the effect of land use change may be hastening the onset of the 2500L/s minimum flow.
54. I understand (*pers comm* Bruce McKay, Heinz Wattie and Lesley Wilson, DN & LR Wilson Limited) TANK did not discuss raising the minimum flow to 2500L/s and during discussions members discussed why the limit should be kept at 2000L/s. The Schedule and TANK 9-11 do not reference any investigation or reason to raise the minimum flow.
55. Raising the minimum flow to 2500L/s could jeopardise the investment in pip fruit in the lower Tūtaekurī catchment.

**CONCLUDING COMMENTS**

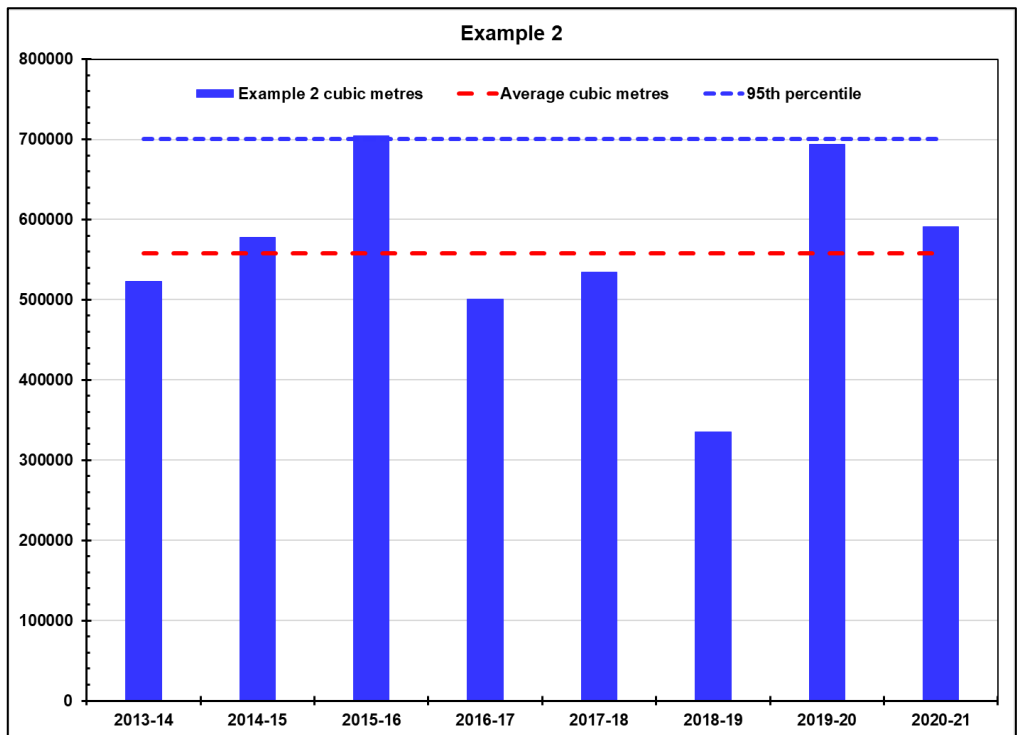
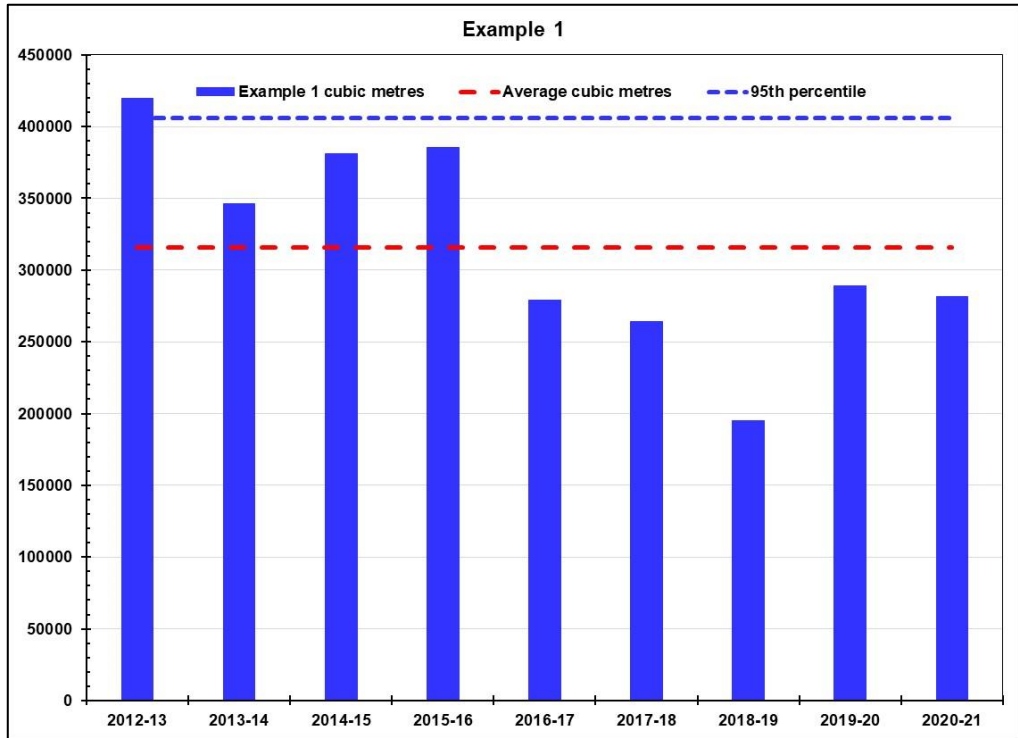
56. I do not support the amended meaning for Actual and Reasonable Use in Chapter 9, Glossary of Terms (b). Adopting the average annual volume will not provide for the demand in the 95<sup>th</sup> percentile season. This has been demonstrated by the examples from AFL water meter records.
57. I do not support groundwater being managed as an over allocation. Water meter data shows actual irrigation use is approximately 41% of allocated use, similar to the HBRC estimate an average total use of 48%. This equates to actual irrigation use of 67 Mm<sup>3</sup>/year and total use of 78Mm<sup>3</sup>/year, less than the interim allocation limit.
58. I support the transfer of groundwater and surface water permits that have already been exercised and the transfer should be enabled. Other than nutrient losses, the effects of these permits exist in the environment and are already counted in the groundwater allocation limit.
59. I do not support the changes in land use and the nutrient provisions of Table 1 of Schedule 29 and, by inference TANK 5 and 6, and Policy 21 need to be amended.
60. While flow data shows raising the minimum flow in the Tūtaekurī River there is no effect on irrigation ban days, the reason for raising the minimum flow is unclear.

**Anthony Davoren**

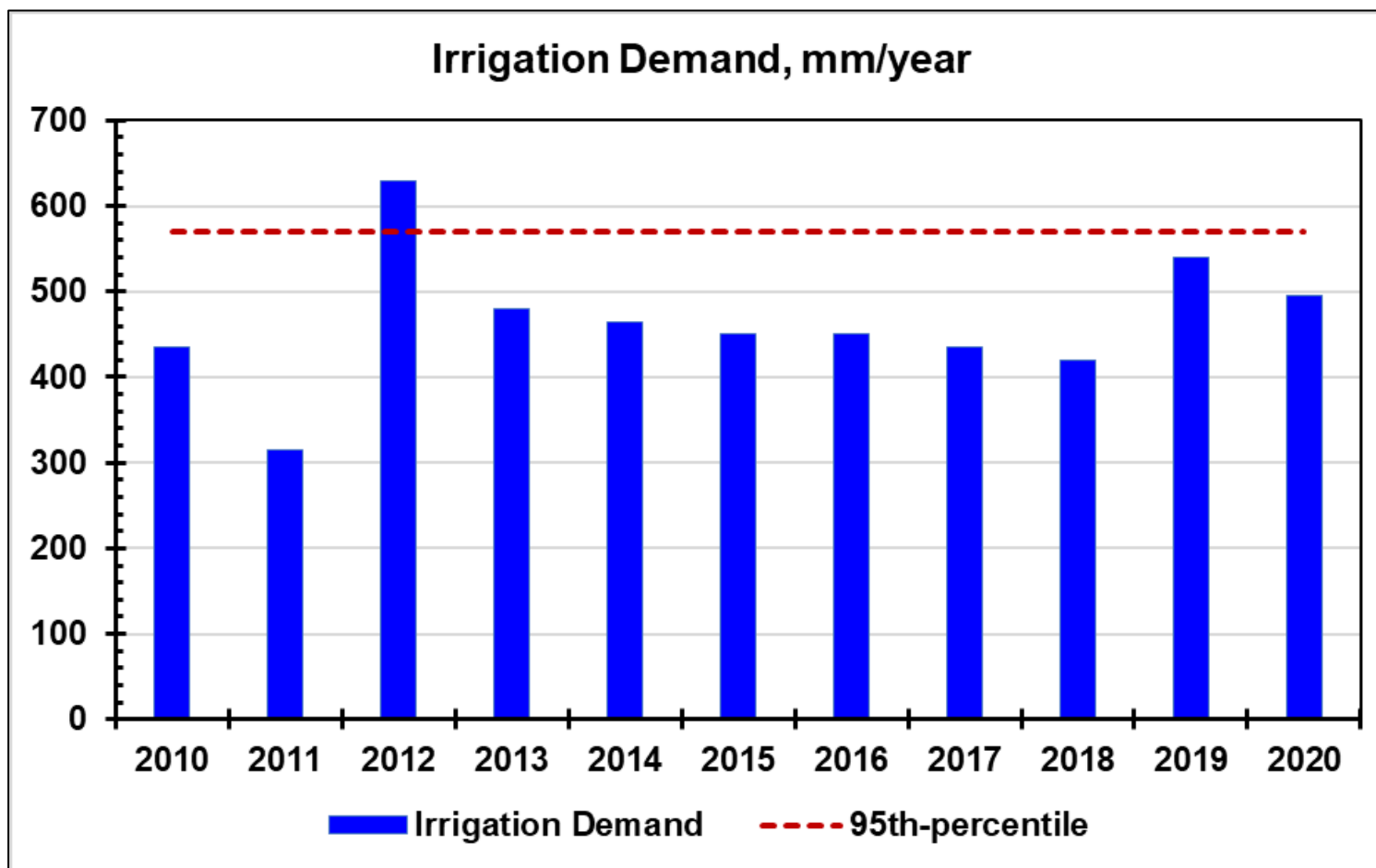
11 May 2021

### Appendix 1

Water meter volume analyses for two Apatu Farms Ltd arable properties.



Appendix 2. Irricalc irrigation demand modelling results at Bridge Pa for seasons 2010-11 to 2019-20.



**Appendix 3.**

Link to Mayfield Hinds Valetta Irrigation Scheme consent application decision, 21 April 2021

<https://www.ecan.govt.nz/get-involved/news-and-events/2021/questions-addressed-on-mayfieldhindsvaletta-irrigation-schemes-application-for-consent-renewal/>

**Appendix 4.** Tūtaekurī mean daily flow, current and proposed minimum flow.

