

**BEFORE THE SPECIAL TRIBUNAL FOR THE NGARURORO AND CLIVE RIVERS  
WATER CONSERVATION ORDER  
AT NAPIER**

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

**AND**

**IN THE MATTER** of a Special Tribunal appointed under  
s202 of the Act to consider an application  
for a Water Conservation Order made by  
New Zealand Fish and Game Council, the  
Hawke's Bay Fish and Game Council,  
Ngāti Hori ki Kohupatiki, Whitewater New  
Zealand, Jet Boating New Zealand, and  
the Royal Forest and Bird Protection  
Society of New Zealand (the Applicants)  
in relation to the Water Conservation  
Order

**The Special Tribunal** Richard Fowler QC (Chair)  
Alec Neill  
Dr Roger Maaka  
Dr Ngaire Phillips  
John McCliskie

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**STATEMENT OF EVIDENCE OF STUART JOHN FORD**

25 January 2019

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## INTRODUCTION

### Qualifications and experience

1. My full name is Stuart John Ford. I am a Director of The AgriBusiness Group and work as an agricultural and resource economist based in Christchurch. I have a Diploma in Agriculture and Bachelor of Agricultural Commerce from Lincoln University and have undertaken post graduate studies in Agricultural and Resource Economics at Massey University.
2. I am a member of the New Zealand Agriculture and Resource Economics Society and the Australian Agriculture and Resource Economics Society. I am also a member of the New Zealand Institute of Primary Industry Management.
3. I have spent 37 years as a consultant in the agricultural industry, with the last twenty years specialising in agricultural and resource economics and business analysis.
4. I have undertaken a wide range of economic impact and cost benefit assessments of proposed statutory planning proposals particularly in relation to proposals to change minimum flow triggers on rivers and the impact on irrigators and the wider economy.
5. I have prepared evidence and presented it to District and Regional Council Hearings Panels as well as the Environment Court and Special Hearing Panels on Conservation Orders.

### Involvement in project

6. I have been involved in this project since September 2017 when I went on a jet boat trip up the river as far as it was possible to travel in a jet boat. I then took part in a meeting with the Hawke's Bay Regional Council (**HBRC**) where we discussed the possibility of running some specific Horticultural models through the HBRC's source model.
7. I have taken part in a number of subsequent meetings where we have discussed the potential impact of the proposed Water Conservation Order (**WCO**) on the horticultural sector and the progress and the results of the HBRC's TANK process.
8. I have been asked by Horticulture New Zealand (**HortNZ**) to provide this evidence.

9. In preparing this evidence I have read the application, annexes to the application, the Applicant's evidence for the lower River hearings and:
  - (a) HortNZ: Ngaruroro WCO submission FINAL;
  - (b) TANK Plan Change v8;
  - (c) Steve Green (Plant & Food): Modelling the impact of water restrictions;
  - (d) Market Economics 2018: Economy wide Impacts of Proposed policy options TANK catchments;
  - (e) AgFirst 2018: Modelling Water Restrictions and Nutrient Losses for Horticulture;
  - (f) AgFirst 2017: Part 2 of the TANK Economic Social and Ecological Assessment;
  - (g) NimmoBell 2018: TANK Direct Economic Impacts FINAL;
  - (h) Market Economics 2018: TANK Wider Economic Impacts Powerpoint presentation; and
  - (i) Ngaruroro Values to Attributes Report Oct 2016.
10. I have also read some of the submissions lodged with the Environmental Protection Agency.
11. Although I am aware that this hearing is to consider the potential application of a WCO my evidence has been prepared in accordance with the Code of Conduct for expert witnesses as set in Section 7 of the Environment Court of New Zealand Practice Note 2014.

**Purpose and scope of evidence**

12. HortNZ asked me to provide this report on the potential economic impacts on the horticultural sector of the proposed WCO of the Lower Ngaruroro River in the Hawke's Bay region;
13. In my evidence I consider the following:
  - (a) The economic contribution of horticulture on the Heretaunga Plains;
  - (b) The vulnerability of the horticultural sector to irrigation restrictions.

- (c) My analysis of the proposed WCO's impact on horticultural land in the region;
- (d) My conclusions and recommendations.

## **THE ECONOMIC CONTRIBUTION OF HORTICULTURE ON THE HERETAUNGA PLAINS**

14. I have worked as a consultant for HortNZ for approximately the last fifteen years dealing in matters related to economics and resource use. During that time I have been able to develop a detailed understanding of the extent and the nature of horticultural operations across the Hawke's Bay and their relationship with irrigation and resource use through completion of reports such as "Economic Impact of Proposed Minimum Flows on Horticultural Irrigators on the Tukituki River" and "Hawke's Bay Horticultural Nutrient and Financial Benchmarking Results" and evidence given to the Board of Inquiry into HBRC's Plan Change 6 which dealt with the management of the Tukituki River.
15. The area which I refer to in my evidence is the Heretaunga Plains area which incorporates all of the area identified in the AgFirst<sup>1</sup> report as being hydraulically connected to the Ngaruroro River. This area is a substantial proportion of the total area in horticulture in Hawke's Bay.
16. The Hawke's Bay area is unique in New Zealand with its combination of soil types and its climate which make it ideal for horticultural production. The climate encourages the growth of crops which require some degree of low winter temperatures with the hot and dry summer temperatures allowing good summer growth and maturity of crops and ideal harvest conditions. This has encouraged the development of the wide range of horticultural crops grown in the area. These range from the permanent crops like grapes, kiwifruit, pipfruit, stonefruit to the relatively short term process crops like squash, beetroot, onions etc.
17. The one thing which is essential to the growing of these crops in Hawke's Bay economically is the ability to irrigate them at times in their growth when soil moisture is limiting their growth potential.

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<sup>1</sup> AgFirst (2018): Modelling Water Restrictions and Nutrient Losses for Horticulture in the TANK Catchment – An Economic Analysis

18. The economics of growing these crops is variable in that it waxes and wanes according to local or international prices. The demand for irrigation waxes and wanes according to the variable rainfall of the region. It is essential that the reliability of irrigation capability is maintained to encourage growers to continue to grow the crops.
19. In association with the ability to grow the crops the off farm processing industry in Hawke's Bay has also been developed to be able to receive process and pack the horticultural produce and to then market it throughout the world. This off farm industry is a significant contributor and a significant employer to and in the Hawke's Bay economy.
20. Many of these industry players beyond the farm gate are now made up of multinational companies who operate in Hawke's Bay because of the relatively unique nature of productivity in the region. However they are not tied to Hawke's Bay and if a crop can be grown cheaper in another part of the world and they can process it economically there then they will move their production to that site.
21. This means that although the horticultural industry and its downstream processing is well founded in Hawke's Bay it is constantly operating on a knife edge of pressure on the profitable production of the crops it is able to produce. This pressure comes from other locations in the world where the same crops can be grown.
22. The one thing that Hawke's Bay horticultural sector has been able to do is constantly improve the quality of the crops that it produces. This is often done with the use of advanced technology in the growing of the crop which enables it to achieve high yields of high quality produce by international standards. The use of irrigation is a prime example of the use of technology in growing the crops in order to achieve both acceptable yields but also of a constantly high quality. This has enabled Hawke's Bay to maintain its position as a preferred grower of many of these crops in an international market place.
23. In the AgFirst report they developed a model which represented horticultural production within the area that they considered was hydraulically connected to the Ngaruroro River. In that model they estimated that there was a total of 16,851 ha of land that was devoted to horticultural

production. The crop mix which was adopted in the AgFirst report is shown in Table 1.

**Table 1: Irrigated horticultural land area in each crop within the TANK area.**

<b>Crop</b>	<b>Area (ha)</b>
Pipfruit	6,006
Grapes	4,347
Summerfruit	500
Kiwifruit	180
Process Vegetables	
Onions	873
Peas and Beans	873
Squash	1,745
Sweetcorn	873
Other Vegetables	1,454
<b>Total</b>	<b>16,851</b>

24. Analysis of Table 1 indicates that the area is approximately one third of each in pipfruit, grapes and process cropping, which represents a wide range of crops.
25. In the AgFirst modelling they identified that under the current situation in terms of restrictions on irrigation the average result expressed as Earnings Before Interest and Tax<sup>2</sup> (**EBIT**) as an average of the 18 years between 1998 and 2013 for the area totalled \$183 m.
26. If we were to use the relationships shown in the AgFirst report which represent the difference between the figure shown for EBIT and the total farm / orchard gate income on the \$183 m this would represent a total of approximately \$761 m in output or GDP which can be attributed to the area of irrigated horticultural land within the TANK area.
27. In 2017 Statistics New Zealand reported that the total GDP of the Hawke's Bay Region was \$7.4 b. This would mean that the output of irrigated horticulture within the area defined by the

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<sup>2</sup> EBIT = Total Income minus Working Expenditure minus depreciation and lease payments.

TANK as measured by GDP is 10.3 % of the total output of the Hawke's Bay Region.

28. If we were to estimate the total direct (farm / orchard gate) and the flow on impact of this level of output it would represent a significant proportion of the GDP, value added, employment, as expressed as Full Time Equivalents (FTE) and household income of the Hawke's Bay Region.
29. The area that represents the irrigated horticultural area within the TANK area represents a large and significant proportion of the output of the Hawke's Bay region. It supports a considerable amount of flow on contribution both in economic output and in employment.

#### **THE VULNERABILITY OF THE HORTICULTURAL SECTOR TO IRRIGATION RESTRICTIONS.**

30. As I said earlier in this evidence "It is essential that the reliability of irrigation capability is maintained to encourage growers to continue to grow the crops." Irrigation reliability is a critical factor in the growers choice of crops because it is an absolutely essential element in both the crop quantity, as expressed in yield, and quality, as expressed in grading of the crop.
31. In the AgFirst report they were able to model the output, which is expressed in both yield and grade of the crops grown over the 18 year period which they modelled across a range of scenarios which represented different combinations of consented irrigation take conditions. The irrigation take conditions effectively represent a range of supply reliability for irrigation.
32. The results of this modelling are shown in **Table 2**.

**Table 2: Modelled EBIT earnings for horticultural operations within the TANK at varying supply reliability.**

Scenario	Description of take conditions.	Average EBIT (\$ m)	EBIT in 2013* (\$ m)	Change from average (%)
Base Case	Ngaruroro 2,400 l / sec	183	136	74%
Future A	Ngaruroro 4,000 l / sec Restricted to "4 in 5" year allocation	144	-\$100	-69%
Future B	Ngaruroro 3,600 l / sec Restricted to "4 in 5" year allocation	148	-99	-67%
Future C 2	Zone 2 -4 restricted to "9 in 10" year allocation.	124	-77	-62%

\*2013 was the worst year in terms of drought conditions from within the 18 years that were modelled.

33. We can see from **Table 2** that there is change between the average results which represent a:
- (a) 21% drop in EBIT between the base case and future A,
  - (b) a 19% drop in EBIT between the base case and future B and,
  - (c) a 32% drop in EBIT between the base case and future C 2.
34. We can also see from **Table 2** that the result in the worst year, expressed as EBIT in 2013, is of a very significant negative change in the EBIT of 29% for the base case, 169% for the future A scenario, 167% for the future B scenario and 162% for the future C 2 scenario.
35. What these results indicate is that the irrigated horticultural industry in Hawke's Bay is incredibly sensitive to changes in the supply reliability of their irrigation water. A change in the minimum flow regime of 50% which represents the change from the base case to future B results in a drop of 19% in the average EBIT.
36. The changes which occur in the worst year in the future scenarios are so extreme that it is difficult to imagine the horticultural industry's ability to recover from such a heavy

loss. In my opinion the horticultural industry is not resilient enough to be able to manage such a massive loss in one year.

### **MY ANALYSIS OF THE PROPOSED WCO IMPACT ON HORTICULTURAL LAND IN THE REGION**

37. I understand the HortNZ is not opposed to granting a WCO in the upper Ngaruroro River.
38. I have examined the application documents and the expert evidence for the Applicants. I have also considered the expert evidence for HortNZ which questions whether the applicant has established that the lower Ngaruroro contains sufficient "outstanding values" to justify its inclusion in the WCO.
39. I am not an expert in relation to the matters covered by these other experts for HortNZ but I have had many years of experience dealing with the complex economic issues associated with the conflicting demands for water resources (both in terms of water quality and water quantity). Based on this experience and my review of the evidence it appears clear that many of the characteristics of the Lower River do exhibit some degree of regional significance but fall short of exhibiting outstanding values when they are considered on a national basis.
40. I understand that in the TANK analysis process they assigned the current state of the Lower Ngaruroro as providing 44% of habitat protection. The HBRC's theoretical aim is to provide for 90% habitat protection. This measure highlights the point that the Lower Ngaruroro River in its current state does not appear to meet the requirement of exhibiting outstanding values.
41. For the renewals of existing consents the WCO (clause 12d) states that this will essentially not be affected provided they are on the same basis as the original consent.
42. From an economic perspective I am not persuaded that the impact on existing consents is as the WCO intends it to be. It is clear from the grower statements of evidence that there is significant concern about the impact of the WCO will have. These concerns inevitably develop into situations where there is investment uncertainty around the sustainability of horticultural activities.
43. It is my opinion that the WCO as applied for is far from specific about the exact nature of the outstanding values and it does

not provide any specific metrics around many of the values which the HBRC would be required to protect. So in the end the applicants are left in a very uncertain position as to whether consents are likely to be granted and on what basis. I refer to the evidence of Ms Holmes and Ms Drury for HortNZ who also hi-light the difficulties with the WCO as currently drafted

44. In my experience uncertainty around the supply reliability of water in a horticultural context will have the impact of stifling any further investment in terms of innovation.
45. In relation to renewal of existing consents the WCO notes that when they are due for a renewal that they can be renewed on the same conditions as at present unless the HBRC has more stringent rules. It interests me that the Applicants are applying for a WCO which I interpret as protecting specific outstanding values when the Applicants admit that the HBRC may decide to impose more stringent rules. This somewhat begs the question of the need for a WCO.
46. The threat of the possibility of more stringent rules may have the effect of stifling any further investment into horticulture.
47. While the possibility of more stringent rules exists without the imposition of a WCO the double impact of a WCO and the outcome of the TANK process is more significant than the TANK process alone.
48. As outlined by Ms Drury and Dr Mitchell for the Regional Council the collaborative nature of the TANK process is such that the conflicting and competing demands for water are able to be fully assessed and inevitably (as always occurs in these processes in my opinion) trade-offs will have to be made. Such trade-offs are fully envisaged by the RMA and in particular section 32 that requires the costs and benefits of plan provisions to be fully analysed and assessed.
49. From an economic perspective, I therefore, fully support the views expressed by those planners noting that the TANK plan change process is the correct mechanism for addressing all the issues associated with the Lower River – including those matters of concern and interest to the Applicants.

#### **New applications for water**

50. The WCO and the Applicants experts note that new applications for water will theoretically (my words) be

allowed. I say theoretically because such application would have to have a no more than minor effect on the braided river form or the outstanding characteristics identified in Schedules 2 or 3 of the draft WCO and they will be subject to a minimum flow of 2400 l / sec at Fernhill.

51. As noted by others (Ms Drury and Ms Holmes) clause (9d) is unworkable because the Applicants have been too general in their description of the outstanding values and do not provide any metrics around them that an applicant or the HBRC could use to be able to measure / model them against in order to assess whether the application for a new consent was able to prove that they would not have a more than minor effect on the braided river or the outstanding characteristics that have been identified in the application.
52. This uncertainty around assessment criteria would mean that there would be little chance of an application for a consent for new water. This lack of clarity and uncertainty has a direct negative impact on investment certainty.

#### **Provisions to allow for water harvesting**

53. In the draft WCO (clause 9) there are a range of sub clauses which refer to the ability for applicants to gain consents to abstract water from the river. It is my interpretation of these clauses that the only flow regime that it is allowed to abstract water from the river is between 1.5 and 3 times the median flow. Although I have not seen any data which indicates how regularly the river flow is between these two flow regimes in my experience this is a very restrictive flow regime in terms of time that water can be allowed to be abstracted.
54. In my opinion the water harvesting conditions are so stringent that it is unlikely that it would be viable or economic for any water harvesting to proceed. I further refer and rely on Ms Holmes in relation to this matter.

#### **Restrictions as to Water Quality conditions**

55. The restrictions as to water quality as listed in Schedule 5 are very general in their nature, are not specific as to how and where they are to be measured, in some cases refer to annual average concentrations and therefore it will be very difficult for the HBRC to determine how they can be complied with under an allocation regime which must share the load of compliance equally amongst the consent holders.

56. In my opinion the water quality limits set in the application will be impossible to manage in any way by the HBRC. Again I rely on the evidence of Ms Holmes.

## **CONCLUSIONS AND RECOMMENDATIONS**

### **Conclusions**

57. The area that represents the irrigated horticultural area within the TANK area represents a large and significant proportion of the output of the Hawke's Bay region. It supports a considerable amount of flow on contribution both in economic output and in employment.
58. What these results indicate is that the irrigated horticultural industry in Hawke's Bay is incredibly sensitive to changes in the supply reliability of their irrigation water. A change in the minimum flow regime of 50% which represents the change from the base case to future B results in a drop of 19% in the average EBIT.
59. The changes which occur in the worst year in the future scenarios are so extreme that it is difficult to imagine the horticultural industry's ability to recover from such a heavy loss. In my opinion the horticultural industry is not resilient enough to be able to manage such a massive loss in one year.
60. It is my opinion and based on the evidence of other experts for HortNZ that all of the characteristics do exhibit some degree of regional significance but fall short of exhibiting outstanding values when they are considered on a national basis.
61. It is my opinion that it will be very difficult for the HBRC to achieve the aim of the WCO because the WCO as applied for is far from specific about the exact nature of the outstanding values and it does not provide any specific metrics around many of the values which the HBRC would be required to protect. So in the end the consent holders and applicants for new consents (takes and discharges) are left in a very uncertain position as to what exactly the metrics are around the outstanding values and when and if the conditions of their consents would be changed to try and protect them if the current level of protection is insufficient.
62. This uncertainty around assessment criteria would mean that there would be little chance of an application for a consent for new water to be successful.

63. In my opinion the water harvesting conditions are so tight that it is unlikely that it would be viable or economic for any water harvesting to proceed.

### **Recommendations**

64. I would recommend that the Special Tribunal decline the application to impose a WCO on the lower river because:
- (a) The Applicants have not proven the outstanding nature of the characteristics of the river that are worth preserving.
  - (b) The Applicants fully expect that the HBRC may impose more stringent controls than those that they have asked for – so why is a WCO needed at this point in time.
  - (c) Much of the framework proposed is general and not specific and would therefore be impossible to enforce in order to achieve their aims.
  - (d) The horticulture sector is significant and is likely to grow in the future and from an economic perspective should not be restricted from the potential to grow for poorly justified reasons as to its outstanding nature.

**Stuart John Ford**

25 January 2019