

**From:** [Georgina Hamilton](#)  
**To:** [Plan Hearings](#)  
**Cc:** [mwebb](#); [Judy Blakemore](#); [Julia Crossman](#); "[Andrew Mockford](#)"; [Keri Johnston](#); [Greg Ryder](#); [grantporter@xtra.co.nz](#); [Saunders, Caroline](#); [Tim Ensor](#)  
**Subject:** Plan Change 7: Opihi Flow and Allocation Working Party (PC7-382) - Evidence in Chief  
**Date:** Friday, 17 July 2020 5:50:39 pm  
**Attachments:** [Evidence of Mark Webb 17.7.20.pdf](#)  
[Evidence of Gregory Anderson 17.7.20.pdf](#)  
[Evidence of Mark Hawkins 17.7.20.pdf](#)  
[Evidence of Grant Porter 17.7.20.pdf](#)  
[Evidence of Caroline Saunders 17.7.20.pdf](#)  
[Evidence of Murray Bell 17.7.20.pdf](#)  
[Evidence of Dan Davies 17.7.20.pdf](#)  
[Evidence of Keri Johnston 17.7.20.pdf](#)  
[Evidence of Dr Gregory Ryder 17.7.20.pdf](#)  
[Evidence of Gregory McAlister 17.7.20.pdf](#)  
[Evidence of Timothy Ensor 17.7.20.pdf](#)  
[Evidence of Jonathan Sutherland 17.7.20..pdf](#)

---

Dear Tavisha

We act for the Opihi Flow and Allocation Working Party (**OFAWP**), submitter no. PC7-382.

We **attach** for filing, in relation to the above matter, statements of evidence in chief of the following witnesses on behalf of the OFAWP:

1. Mark Webb (OFAWP representative – Fish & Game);
2. Gregory Anderson (OFAWP representative – North Opuha);
3. Murray Bell (OFAWP representative – Upper Opihi);
4. Deiniol Davies (OFAWP representative – South Opuha);
5. Mark Hawkins (OFAWP representative – Te Ana Wai);
6. Keri Johnston (hydrology);
7. Dr Gregory Ryder (ecology/freshwater quality);
8. Grant Porter (economics);
9. Dr Caroline Saunders (economics);
10. Tim Ensor (planning);
11. Gregory McAlister (drone footage);
12. Johnathan Sutherland (drone footage).

Kind regards,

Georgina Hamilton  
Partner



Level 1, 24 The Terrace, TIMARU 7910 | PO Box 244, TIMARU 7940  
PHONE: 03 687 8004 | DDI: 03 687 8065 | MOBILE: 027 686 9252 | FAX: 03 684 4584  
EMAIL: [georgina@gressons.co.nz](mailto:georgina@gressons.co.nz)

NOTE: The information contained in this email (and any accompanying documents) is **CONFIDENTIAL INFORMATION** and may also be **LEGALLY PRIVILEGED**, and is intended only for the individual or entity named above. If you are not the intended recipient, you are hereby notified that any use, review, dissemination, distribution or copying of this document is strictly prohibited. If you have received this document in error, please immediately notify us by telephoning 0800 684 882 and destroy the original message. Gresson Dorman & Co accepts no responsibility for changes made to this email or to any attachments after transmission.



**BEFORE INDEPENDANT HEARING COMMISSIONERS  
APPOINTED BY THE CANTERBURY REGIONAL COUNCIL**

**UNDER:** the Resource Management Act 1991

**IN THE MATTER OF:** Proposed Plan Change 7 to the  
Canterbury Land and Water Regional  
Plan – Section 14: Orari-Temuka-Opihi-  
Pareora

---

**STATEMENT OF EVIDENCE IN CHIEF OF CAROLINE MARY SAUNDERS ON  
BEHALF OF THE OPIHI FLOW AND ALLOCATION WORKING PARTY  
(SUBMITTER NO. PC7- 382)**

Dated: 17 July 2020

---

---

GRESSON DORMAN & CO  
Solicitors  
PO Box 244, Timaru 7940  
Telephone 03 687 8004  
Facsimile 03 684 4584  
Solicitor acting: G C Hamilton  
georgina@gressons.co.nz

## CONTENTS

1. INTRODUCTION .....	3
Background .....	4
Code of Conduct.....	4
2. SCOPE OF EVIDENCE .....	4
3. EXECUTIVE SUMMARY .....	5
4. CONTEXT AND ISSUES .....	8
5. METHODOLOGY .....	9
Introduction.....	9
Economic Impact Assessment (EIA).....	10
Direct effect	11
Indirect effect	12
Induced effect	12
6. ECONOMIC IMPLICATIONS.....	12
7. PROJECT SCENARIOS & ASSESSMENTS ASSUMPTIONS .....	13
Project Assumptions .....	13
8. RESULTS.....	16
Scenario 2025 .....	16
Economic Effects	16
Employment Impacts .....	20
Scenario 2030 .....	21
Economic Effects	21
Employment Impacts	24
9. IMPLICATIONS OF THE SECTION 42A REPORT RECOMMENDATIONS ....	25
10. HARRIS REPORT .....	26
11. CONCLUSION.....	27

## 1. INTRODUCTION

- 1.1. My full name is Caroline Mary Saunders. Since 2001, I have held the positions of Professor of Trade and the Environment and director of the Agribusiness and Economic Research Unit at Lincoln University.

### **Qualifications and experience**

- 1.2. I graduated from the University College of North Wales in 1979 with an honours degree in Agriculture and Agricultural Economics, and from the University of Newcastle (UK) in 1987 with a PhD in Agricultural Economics. I was employed at the University of Newcastle upon Tyne firstly as a research associate then as a lecturer from 1984 to 1994 and then 1995 to 1996. I was employed at Lincoln University in 1994 to 1995 as a senior lecturer and then from 1996 to date.
- 1.3. Over the last 30 years I have been engaged in a number of research projects relating to the economics of agriculture. I have published extensively on the development of agricultural economics and cost benefit of land use options and I have over 300 publications.
- 1.4. My research focuses on sustainable wellbeing specialising in agri-environmental issues and policy, including the impacts of irrigation. I have undertaken research for a wide range of private and public bodies both in NZ and overseas, including the EU commission, Department for Environment, Food and Rural Affairs, Food and Agriculture Organisation, Organisation for Economic Co-operation and Development, Ministry of Agriculture and Forestry, Ministry of Foreign Affairs and Trade, Treasury, Ministry for the Environment, Ministry of Economic Development (MBIE), New Zealand Trade and Enterprises, Fonterra, Ministry of Transport, Meat Industry and various other sector groups.
- 1.5. I am a Crown appointee on the Board of Landcare Research and a member of the Reserve Bank Monetary Policy Committee. I am the President of the Agricultural Economics Society (UK), received the NZ institute of Economic Research Incorporated Economics Award in 2007 and the New Zealand Order of Merit in 2009.

## **Background**

- 1.6. I am familiar with the provisions of PC7 to which these proceedings relate. In preparing my evidence, I have reviewed the relevant parts of the section 32 Report and the section 42A Report. In preparing my evidence, I have also reviewed:
- (a) Economic Assessment of the Healthy Catchments Project Proposed Zone Implementation Programme Addendum (Harris, S (2019) Land and Water People); and
  - (b) The evidence in chief of Mr Grant Porter.

## **Code of Conduct**

- 1.7. I confirm that I have read the Code of Conduct for expert witnesses contained in the Environment Court's Practice Note as updated in 2014. My evidence has been prepared in compliance with that Code. In particular, unless I state otherwise, this evidence is within my area of expertise and I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.

## **2. SCOPE OF EVIDENCE**

- 2.1 I have been asked by Opuha Water Ltd (**OWL**) to evaluate the potential direct, indirect and induced economic impacts for the Mackenzie and Timaru Districts, Canterbury and New Zealand of restrictions arising from changes to existing minimum flow and partial restriction regimes for three different farming systems within the four catchment areas of North Opuha, South Opuha, Upper Opihi and Te Ana Wai catchment zones proposed by Plan Change 7 to the Canterbury Land and Water Regional Plan (**PC7**). My assessment focuses on the economic impacts resulting from the proposed changes on consent holders affiliated to OWL.

2.2 My evidence is structured as follows:

- (a) Executive Summary
- (b) Context and issues
- (c) Economic Methods
- (d) Economic Implications
- (e) Project scenarios and assessment assumptions
- (f) Assessment
- (g) Conclusion

### 3. EXECUTIVE SUMMARY

3.1 This evidence records the outcomes of modelling I have undertaken to assess the implications of the proposed changes to minimum flow and partial restriction regimes for the Mackenzie and Timaru Districts, Canterbury's and New Zealand's economy under PC7.

3.2 I have applied economic impact analysis (**EIA**) for the effects on the economy. This shows the direct, indirect, induced and the total impact on the economy and employment. Two scenarios were modelled and compared to the baseline ('no change' case or current situation); firstly, the impacts of proposed changes that apply from 2025 and secondly those that apply from 2030.

**Table 3.1: Contribution to economic outcomes on district, regional and national level from Scenario 2025 and Scenario 2030.**

District	Scenario	Aggregated farm gross income (NZ\$/ annum)	Contribution to output (NZ\$/ annum)	Contribution to Employment (FTE/ annum)
Mackenzie District	Scenario 2025	-1,779,417	- 2,290,485	-9
	Scenario 2030	-2,475,803	- 3,185,951	-13
Timaru District	Scenario 2025	-76,234	- 143,320	-0.8
	Scenario 2030	-121,125	- 227,715	-1.2
Districts Total	Scenario 2025	-1,855,651	-2,433,805	-9.8
	Scenario 2030	-2,596,928	-3,413,666	-14
Canterbury	Scenario 2025	-1,855,652	- 3,537,284	-13
	Scenario 2030	-2,596,928	- 4,959,155	-18
New Zealand	Scenario 2025	-1,855,652	- 4,310,169	-17
	Scenario 2030	-2,596,928	- 6,039,607	-24

- 3.3 Table 3.1 summarises the results on the economic impacts for Mackenzie and Timaru Districts, Canterbury and New Zealand from the proposed changes that apply from 2025 and from 2030. Results are shown for aggregated farm gross income that is the direct impact from the proposed changes, contribution to output that is the total impact from the proposed changes that apply from 2025 and from 2030 and contribution to total employment from the proposed changes.
- 3.4 In the first scenario (2025) the drop in aggregated annual farm gross income is estimated to be \$1,855,651 in the two districts.
- 3.5 By farm type, results show the largest impact on aggregated annual farm gross income is estimated for the dairy farming sector, estimated to drop by \$1,531,265, then sheep, beef and effect grain farming estimated to fall by \$294,153, then dairy support by \$30,234.
- 3.6 The largest fall in aggregated annual farm gross income is in South Opuha, estimated at \$1,319,836, followed by Upper Opihi at \$287,307, then Te Ana Wai at \$229,229, and North Opuha at \$19,280.
- 3.7 The total economic impact (i.e. contribution to output) for the districts, region and country by farm type on an annual basis for the Mackenzie District is estimated to drop by \$2,290,485, for Timaru District \$143,320, for Canterbury \$3,537,284 and for New Zealand \$4,310,169.
- 3.8 The contribution to total employment is estimated to drop by 9 FTEs annually in Mackenzie, 0.8 FTE in Timaru, 13 FTEs in Canterbury and 17 FTEs in New Zealand.
- 3.9 In the second scenario (2030) the drop in aggregated annual farm gross income for the four catchments is estimated at \$2,596,928.
- 3.10 By farm type, the largest loss is estimated for the dairy farming sector (\$2,084,058/annum), then sheep, beef and grain farming (\$462,796/annum).
- 3.11 With regards to the catchment zones, South Opuha has the largest direct annual economic impact estimated at \$1,620,355, followed by Upper Opihi at \$564,511, then \$392,781 for Te Ana Wai and North Opuha with \$19,280.



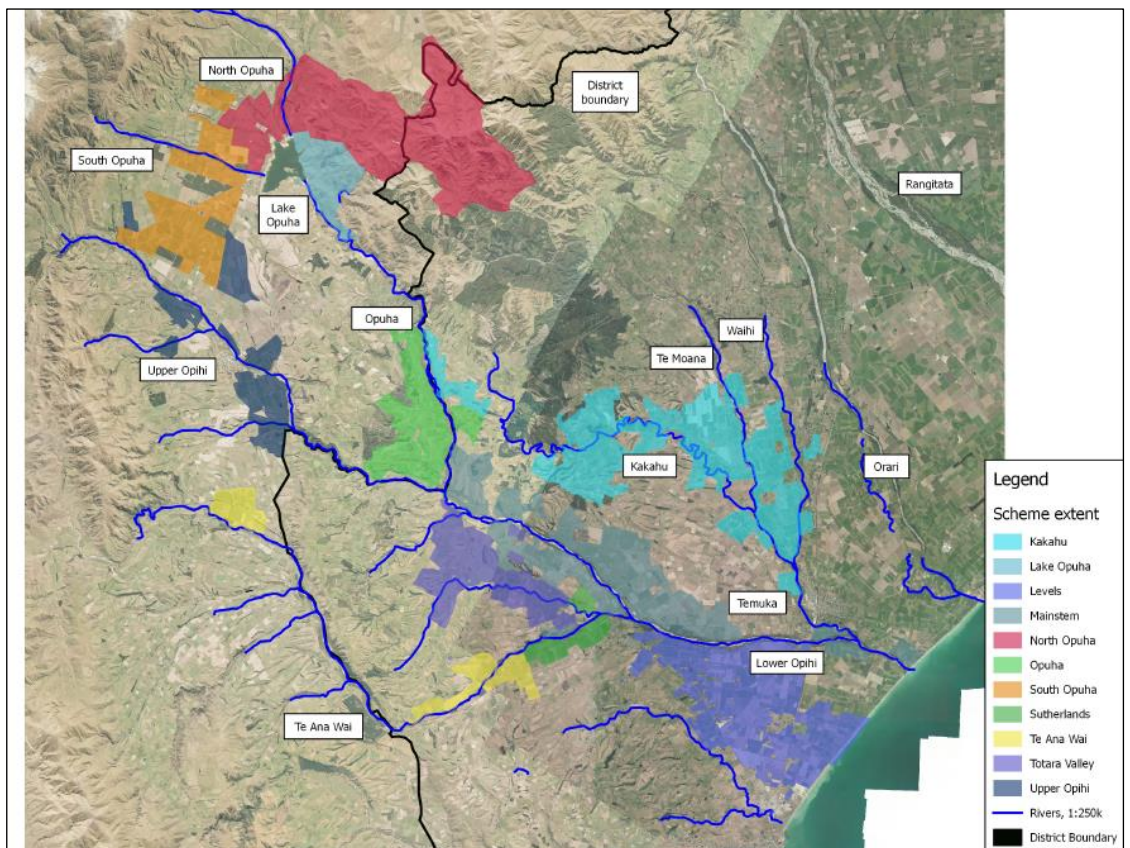
- 3.12 The drop in annual contribution to output for the Mackenzie District is estimated at \$3,185,951, for Timaru District at \$227,715, for Canterbury at \$4,959,155 and for New Zealand at \$6,039,607.
- 3.13 Under the second scenario there is predicted to be a loss of employment of 13 FTEs annually in Mackenzie, 1.2 FTEs in Timaru, 18 FTEs in Canterbury and 24 FTEs in New Zealand.
- 3.14 Mr Porter's analysis indicates that many farms will become unviable under the proposed changes in minimum flows and partial restriction regimes, potentially forcing a change in the current farming type. The economic impact associated with changes in farming type are not accounted for in the modelling results I have reported above, and would most likely result in a greater impact than I have estimated.
- 3.15 Similarly, in terms of the estimated employment impact, the modelling does not account for the decisions made by individual farmers based on their own financial circumstances with respect to employment. The actual employment impact associated with the changes could therefore be greater than I have estimated.
- 3.16 I understand the Section 42A Report recommends changes to the timeframes within which the proposed increases in minimum flows and partial restriction regimes under PC7 would be implemented. If such changes were confirmed, the economic impacts reported above would likewise occur sooner.
- 3.17 Covid 19 has and is having a seriously detrimental impact on the New Zealand and world economy. The agricultural sector has been the underpinning of the economy since the commencement of lockdown and is likely to be for the foreseeable future. Agricultural exports have been maintained ensuring the economic impacts of Covid 19 are reduced. Thus, the impact of reducing agricultural output at this time with limited other opportunities to earn foreign exchange is, in my opinion, a very important consideration for PC7

## 4. CONTEXT AND ISSUES

4.1 In this section, I give a brief description of the economic context.

4.2 The OTO zone is bordered by the Rangitata River in the north and the Pareora River in the south, the Pacific Ocean in the east and inland towards the Main Divide in the west. It includes the Orari, Temuka, Opihi, Opuha, Te Ana Wai, and Pareora rivers and their tributaries, Lake Opuha and the Opuha Dam (see Figure 4.1).

■ **Figure 4.1: OTO Zone and Opuha Scheme Extent**



4.3 Farming activities are very important in the Mackenzie and Timaru District. As shown in Table 3.2, in 2019, there were 900 farms in Timaru's agricultural sector with an employee count of 1,150. In the same year, there were 234 farms Mackenzie District with 320 employees.

- **Table 4.2: Number of farms in agriculture in Timaru District, Mackenzie District and Canterbury Region, 2016 - 2019<sup>1</sup>**

	Timaru District		Mackenzie District		Canterbury Region	
	Geographic Units	Employee Count	Geographic Units	Employee Count	Geographic Units	Employee Count
2016	1,011	1,300	261	320	8,853	11,900
2017	999	1,300	246	300	8,643	11,900
2018	921	1,250	240	310	8,064	12,100
2019	900	1,150	234	320	7,830	1,2100

- 4.4 Covid 19 has and is having a seriously detrimental impact on the New Zealand and world economies. These impacts are unprecedented and have led to range of policy responses. In New Zealand, where control of the pandemic waves has been relatively successful, the level of restrictions on economic activity have been reduced. A major impact has been the closing of the boarder and the ceasing of international tourism.
- 4.5 The agricultural sector has been the underpinning of the economy since lockdown, with exports being maintained and ensuring the economic impacts of Covid 19 are reduced. Thus, the impact of reducing agricultural output at this time with limited other opportunities to earn foreign exchange is a very important consideration for PC7.

## 5. METHODOLOGY

### Introduction

- 5.1 In this section, I examine the implications of the proposed changes for the Mackenzie and Timaru Districts, regional and national economies. I have applied economic impact analysis ("**EIA**") for the impacts on these proposed changes.

<sup>1</sup> Statistics New Zealand (2019). NZStat: Business Demographics Geographic units and employee count by region and industry. StatsNZ: Wellington.

- 5.2 The implications for the economy arise mainly from the effects on dairy and sheep, beef and grain farming activity, and I draw on the farm level data provided in Grant Porter's evidence to identify effects on farming activity and farmer expenditure.
- 5.3 To consider the outcomes, I have applied a scenario approach, where I compare changes to the baseline (baseline = current situation).
- 5.4 A common step in modelling a policy change is to define a base case situation - usually a no change or "business as usual" future - and use that to compare the range of potential impacts of the different scenarios.
- 5.5 I have defined two scenarios to compare with the base case:
- (a) **Scenario 2025:** Minimum flow and partial restriction regimes that apply from 2025
  - (b) **Scenario 2030:** Minimum flow and partial restriction regimes that apply from 2030
- 5.6 All of these apply the farm level revenues and expenditures as estimated by Grant Porter and set out in his evidence.

### **Economic Impact Assessment (EIA)**

- 5.7 For the EIA, I have used a district level Input-Output (**IO**) model for the Mackenzie and Timaru District<sup>2</sup>. In addition, I have used a regional and national IO model for Canterbury and New Zealand<sup>3</sup>. The use of IO models is a standard methodology for Economic Impact Assessment of industry sectors, and the IO models that I have used have been developed using standard methodologies.<sup>4</sup>
- 5.8 I have applied a multi-regional IO model that identifies the economic impacts at the district, regional and national levels.
- 5.9 This is a similar method used by Simon Harris for his estimates of regional outcomes (he calls it regional IO modelling) in his Economic Assessment for PC7 (May 2019). I therefore have not provided a detailed explanation of the modelling approach.

---

<sup>2</sup> Market Economics (2016) 2016 Multi-regional Input-Output Table for Mackenzie District, Timaru District, Rest of Canterbury Region, Rest of New Zealand. Market Economics: Wellington.

<sup>3</sup> Butcher (2013). 2012 -13 Multi-regional Input-Output Table. Canterbury and New Zealand.

<sup>4</sup> Jensen, R. C. (1990). Construction and Use of Regional Input-Output Models: Progress and Prospects. International Regional Science Review, Vol. 13, No 1&2, 9-25.

- 5.10 One of the core strengths of IO analysis is that it captures the complex interactions and interdependencies which take place between different sectors within an economy. This means that it is possible to consider a vast number of the indirect or flow-on effects that occur throughout an economy as a result of any type of economic change. IO analysis also enables economic impacts to be evaluated at the level of individual sectors or industries, thus providing a disaggregated picture of the nature of economic impacts.
- 5.11 At the core of any IO analysis is a set of data that measures, for a given year, the flows of money or goods among various sectors or industrial groups within an economy. These flows are recorded in a matrix or 'IO table' by arrays that summarise the purchases made by each industry (its inputs) and the sales of each industry (its outputs) from and to all other industries. By using the information contained within such a matrix, mathematical relationships are calculated for the economy in question.
- 5.12 These relationships describe the interactions between industries, specifically, the way in which each industry's production requirements depend on the supply of goods and services from other industries. With this information it is then possible to calculate, given a proposed alteration to a selected industry (a scenario), all of the changes in production that are likely to occur in the supporting industries to assess the impact on the wider economy. Model assumptions are further outlined in Chapter 7 in my evidence.
- 5.13 Using this methodology it is possible to estimate the following effects of the proposed changes to the local, regional and national economy:
- Direct Effect
  - Indirect Effect
  - Induced Effect

#### Direct effect

- 5.14 The direct effect is simply the change in the output from farms and/or employment levels.
- 5.15 For the purposes of this study, the output is measured in dollar terms as product passes beyond the farm gate. It is accepted that secondary processing of the product (such as conversion of milk to milk powder) may occur but these

additional economic costs have not been incorporated into the study. By the same token, employment may be generated off-farm for every additional kg of milk fat produced, but the direct effects to employment in this study reflect only the changes in employment on-farm.

#### Indirect effect

- 5.16 The indirect effects are the output and/or employment generated by other firms servicing the farms in the local area, such as input suppliers. An example may be that as production drops, further specialist expertise is needed by a farm such as: transport services, refrigeration specialisation, farm management consultancy, which for example, will be affected as well i.e. as a consequence of the proposed changes.

#### Induced effect

- 5.17 The induced effect is the impact on output and employment resulting from the changes in household expenditure, in the local area, flowing from the estimated direct and indirect effects. The farmer who no longer visit a Café in Fairlie or the electrician who does not purchase goods from the local supermarket are two examples of induced effects arising from changes to minimum flows in the catchment zones.

## **6. ECONOMIC IMPLICATIONS**

- 6.1 It is important to understand the range of different effects associated with the proposed changes for the four catchments (i.e. North Opuha, South Opuha, Upper Opihi, Te Ana Wai). It is especially relevant because different groups in society may bear the costs of a policy, while other groups may gain in terms of the benefits. The distribution of the costs and benefits across society can have important implications for policy makers, and may not be apparent if a policy is assessed only for its aggregate, district level outcomes.
- 6.2 The proposed changes would have two key effects on the economy. First, existing farmers and support industry in the area will need to change their operations to accommodate the restrictions resulting from the proposed changes. This would have multiple effects on existing farm activity; including reductions in revenue and expenditure with a resulting decrease in profit (see Grant Porter's evidence, financial summary data). These changes in operation

have important effects on suppliers to the industry (backward linkages), on households in terms of income (induced), and on processors or wholesalers (forward linkages).

- 6.3 In my modelling, I have established the impacts relating to each group with the exception of the processing industries. This provides an understanding of how the two distinct effects cause economic activity to change in the districts, region and country.
- 6.4 In this evidence, I present only aggregate output and employment impacts. The model does provide detail on the particular industries and how they are each affected, or employment. However, in my view the aggregate results provide sufficient information from which to assess the effects of the proposed changes as represented by the two scenarios.
- 6.5 This analysis is based on financial summary data provided in Grant Porter's evidence, and is used to determine what the likely changes in overall economic activity in the Mackenzie and Timaru Districts, Canterbury and New Zealand would be of proposed changes to the four catchment areas.

## **7. PROJECT SCENARIOS & ASSESSMENTS ASSUMPTIONS**

### **Project Assumptions**

- 7.1 This analysis assesses the economic impacts of the proposed changes on three different farming systems within three catchment zones in the Mackenzie and Timaru Districts, arising from changes to minimum flow rates imposed on the catchments under OTOP plan change.
- 7.2 The four catchment zones examined are:
- North Opuha (Mackenzie)
  - South Opuha (Mackenzie)
  - Upper Opihi (Mackenzie)
  - Te Ana Wai (Timaru)

7.3 Two scenarios are modelled

- (1) Minimum flow restrictions that apply from 2025; and
- (2) Minimum flow restrictions that apply from 2030.

7.4 Each scenario assesses the total economic impacts of three irrigated farming systems from minimising flow change on district, region and national levels.

7.5 The three irrigated farming systems evaluated are:

- Sheep, Beef and Grain Farming
- Dairy Support
- Dairy Farming

7.6 These farm systems currently use irrigation water within the four catchment zones. Table 7.1 below shows the number of farms by type in each of the four catchment zones.

**Table 7.1: Number of farms by type in four catchment zones.**

Farm types	SB	DS	D	Total	District
North Opuha	3	0	0	3	3 (M)
South Opuha	4	0	7	11	11 (M)
Te Ana Wai	2 (T)	2 (T)	1 (M)	5	4 (T); 1 (M)
Upper Opihi	5	0	3	8	8 M
<b>Total</b>	14	2	11	27	4 (T)/ 23 (M)

Note: Mackenzie District (M); Timaru District (T).



7.7 Table 7.2 below shows the restrictions resulting from minimum flow scenarios provided in Mr Porter's evidence. I understand these changes have been calculated from monthly average availability flow data modelling completed by Environment Canterbury, as noted in the evidence of Ms Keri Johnston.

**Table 7.2: Irrigation restrictions for the four catchment areas for the two scenarios, in per cent.**

Month	Monthly Average Restrictions											
	North Opuha			South Opuha			Te Ana Wai			Upper Opihi		
	Current	2025 (%)	2030 (%)	Current	2025 (%)	2030 (%)	Current	2025 (%)	2030 (%)	Current	2025 (%)	2030 (%)
October	2%	3%	3%	3%	10%	10%	2%	9%	13%	6%	9%	10%
November	0%	0%	0%	0%	2%	2%	2%	6%	10%	0%	3%	3%
December	3%	3%	3%	4%	11%	18%	7%	9%	8%	4%	6%	8%
January	4%	5%	5%	15%	26%	30%	17%	20%	25%	9%	13%	20%
February	6%	9%	9%	24%	39%	47%	19%	21%	25%	9%	11%	18%
March	12%	15%	15%	30%	49%	56%	23%	31%	37%	14%	20%	26%
April	6%	18%	18%	35%	62%	62%	18%	42%	46%	29%	41%	46%
May	14%	15%	15%	26%	53%	53%	0%	38%	41%	12%	22%	25%

7.8 Evaluating total economic impacts from the changes to minimum flows requires estimating flow-on multiplier effects. Multipliers allow the estimation of the direct, indirect and induced effects of output and full-time-equivalent (FTE) employment.

7.9 For this analysis, output multipliers for sheep, beef cattle and grain farming and dairy cattle farming for estimating the indirect and induced impacts for the Mackenzie and Timaru Districts were obtained for special analysis for the district level from Market Economics (2016)<sup>5</sup>. Output multipliers for Canterbury and New Zealand were obtained from Geoff Butcher (2013)<sup>6</sup>. Both sources are based on inter-industry output tables for New Zealand produced by Statistics New Zealand for year ended 2013. It should be noted that sheep, beef and grain farming multipliers were used for the economic analysis of sheep, beef and grain farms as well as for dairy support farms in the catchment zones. Dairy farming multipliers were used for the economic analysis of dairy farms in the catchment zones.

<sup>5</sup> Market Economics (2016) 2016 Multi-regional Input-Output Table for Mackenzie District, Timaru District, Rest of Canterbury Region, Rest of New Zealand. Market Economics: Wellington.

<sup>6</sup> Butcher (2013). 2012 -13 Multi-regional Input-Output Table. Canterbury and New Zealand.

- 7.10 Employment estimates associated with the total output – including the direct, indirect and induced impacts – were calculated for the different farming sectors. Direct employment was calculated using direct employment multipliers for the Mackenzie and Timaru Districts, Canterbury and New Zealand provided by Market Economics (2016). The total employment impact was calculated using the combined indirect and induced employment multipliers for the Mackenzie and Timaru Districts provided by Market Economics (2016). In the case of Canterbury and New Zealand, the direct and then indirect and induced multipliers were used provided by Butcher (2013). The multipliers estimate the average number of employees required to produce a million dollars of output by sector.

## 8. RESULTS

### Scenario 2025

#### Economic Effects

- 8.1 The tables below show the direct impact on output (that is the aggregated farm gross income by farm sector) in the four catchment zones, the Mackenzie and Timaru Districts, Canterbury and New Zealand in Scenario 2025 as well as the total impact which comprises direct, indirect and induced impact on the farming sectors in the Mackenzie and Timaru Districts, Canterbury and New Zealand in Scenario 2025.
- 8.2 As shown in Table 8.1, in Scenario 2025, the direct economic impact that is the aggregated farm gross income has been estimated to fall by \$1,855,652 for the four catchments, with the largest drop estimated for the dairy farming sector (\$1,531,265), then sheep, beef and grain farming (\$294,153), then dairy support (\$30,234). With regards to the individual catchment zones, South Opuha has the largest direct economic impact estimated at \$1,319,836, followed by Upper Opihi at \$287,307, then Te Ana Wai at \$229,229, and North Opuha at \$19,280.
- 8.3 Overall, estimates show that the total economic impact that is the contribution to output for the Mackenzie District is an annual loss of \$2,290,485, for Timaru District \$143,320, for Canterbury \$3,537,284 and for New Zealand \$4,310,169 in Scenario 2030 (Table 8.2).

**Table 8.1: Direct output impacts by farm type by catchment zone, in NZ\$, per annum, 2025.**

	North Opuha (M)	South Opuha (M)	Te Ana Wai (M/T)	Upper Opihi (M)	TOTAL
<b>Dairy Farming</b>	0	1,127,731	152,994	250,540	1,531,265
<b>Dairy Support</b>	0	0	30,234	0	30,234
<b>Sheep, Beef and Grain Farming</b>	19,280	192,105	46,001	36,767	294,153
<b>Total</b>	19,280	1,319,836	229,229	287,307	1,855,652

Note: Mackenzie District (M); Timaru District (T). Figures may not always sum to the stated total(s) due to rounding.

**Table 8.2 Direct, indirect and induced output impacts in the Mackenzie and Timaru Districts, Canterbury and New Zealand, in NZ\$, per annum, Scenario 2025.**

	Direct	Indirect	Induced	Total
<b>Mackenzie</b>	1,779,417	190,773	320,295	2,290,485
<b>Timaru</b>	76,234	18,296	48,790	143,320
<b>Canterbury</b>	1,855,652	1,082,242	599,390	3,537,284
<b>New Zealand</b>	1,855,652	1,459,860	994,657	4,310,169

Note: Figures may not always sum to the stated total(s) due to rounding.

8.4 Tables 8.3 – 8.6 show the direct, indirect, induced and total output effects by farm type for the Mackenzie and Timaru Districts, Canterbury and New Zealand under Scenario 2025. As mentioned above, estimates of direct impacts (aggregated farm gross income) for the different farm types in the Mackenzie District was the largest for the dairy farming sector (\$1,531,262), and sheep, beef and grain farming (\$248,153). Estimates of direct output impacts for the different farm types in Timaru District was the largest for sheep, beef and grain farming (\$46,001), then dairy support (\$30,234) (see Table 8.3).

8.5 The multipliers were then applied to the direct impacts in Table 8.3 to calculate the indirect impacts and the results presented in Table 8.3. These indirect output impacts were \$190,773 in the Mackenzie District, \$18,296 in the Timaru District, \$1,082,242 for Canterbury and \$1,459,860 for New Zealand (see Table 8.4).

- 8.6 The multipliers were again used to estimate the induced impacts of the restrictions in minimum flows for Scenario 2025, that is the change in economic activity of households and the results are shown in Table 8.5. This shows the induced output impact for the Mackenzie District are estimated to be \$320,295, for Timaru District \$48,789, for Canterbury \$599,390 and \$994,657 for New Zealand (see Table 8.5).
- 8.7 The total of these impacts is shown in Table 8.6 giving the total economic impact (contribution to output) for the districts, region and country by farm type. The total drop in contribution to output for the Mackenzie District is estimated to be \$2,290,485, for Timaru District \$143,321, for Canterbury \$3,537,281 and for New Zealand \$4,310,167 (see Table 8.6).
- 8.8 The total impacts on the different farm types is estimated to be greatest for dairy farming, followed by sheep, beef and grain farming, then dairy support.
- 8.9 It should be noted that Mr Porter's evidence indicates that many farms will become unviable under the proposed changes in minimum flows and partial restriction regimes, potentially forcing a change in the current farming type/land use e.g. for dairy farms, a land use change to either dairy support or sheep and beef. The model does not account for the economic impact associated with such changes. They are therefore not accounted for in the modelling results I have reported above, and would most likely result in a greater impact than I have estimated.

**Table 8.3: Direct output impacts by farm type in the Mackenzie and Timaru Districts, in NZ\$, per annum, 2025.**

	<b>Dairy Farming</b>	<b>Dairy Support</b>	<b>Sheep, Beef and Grain Farming</b>	<b>TOTAL</b>
<b>Mackenzie</b>	1,531,262	0	248,153	1,779,417
<b>Timaru</b>	0	30,234	46,001	76,235
<b>DISTRICTS</b>	1,531,262	30,234	294,153	1,855,649

Note: Figures may not always sum to the stated total(s) due to rounding.

**Table 8.4: Indirect output impacts by farm type in the Mackenzie and Timaru Districts, Canterbury and New Zealand, in NZ\$, per annum, 2025.**

	<b>Dairy Farming</b>	<b>Dairy Support</b>	<b>Sheep, Beef and Grain Farming</b>	<b>TOTAL</b>
<b>Mackenzie</b>	168,439	0	22,334	190,773
<b>Timaru</b>	0	7,256	11,040	18,296
<b>Canterbury</b>	842,195	22,373	217,673	1,082,242
<b>New Zealand</b>	1,148,448	29,025	282,387	1,459,860

Note: Figures may not always sum to the stated total(s) due to rounding.

**Table 8.5: Induced output impacts by farm type in the Mackenzie and Timaru Districts, Canterbury and New Zealand, in NZ\$, per annum, 2025.**

	<b>Dairy Farming</b>	<b>Dairy Support</b>	<b>Sheep, Beef and Grain Farming</b>	<b>TOTAL</b>
<b>Mackenzie</b>	275,628	0	44,668	320,295
<b>Timaru</b>	0	19,349	29,440	48,789
<b>Canterbury</b>	505,317	8,768	85,304	599,390
<b>New Zealand</b>	842,195	14,210	138,252	994,657

Note: Figures may not always sum to the stated total(s) due to rounding.

**Table 8.6: Total output impacts by farm type in the Mackenzie and Timaru Districts, Canterbury and New Zealand, in NZ\$, per annum, 2025.**

	<b>Dairy Farming</b>	<b>Dairy Support</b>	<b>Sheep, Beef and Grain Farming</b>	<b>TOTAL</b>
<b>Mackenzie</b>	1,975,331	0	315,154	2,290,485
<b>Timaru</b>	0	56,839	86,481	143,321
<b>Canterbury</b>	2,878,775	61,375	597,131	3,537,281
<b>New Zealand</b>	3,521,906	73,468	714,792	4,310,167

Note: Figures may not always sum to the stated total(s) due to rounding.

### Employment Impacts

- 8.10 The tables below show the estimated direct impact on employment in the three farming sectors from the proposed changes for Scenario 2025 as well as the total contribution to employment which comprises direct, indirect and induced impacts for the same scenario.
- 8.11 As shown in Table 8.7, it was estimated that the direct employment impact from the water restrictions totalled 7 FTEs in the Mackenzie District with the largest direct impact estimated for the dairy farming sector (6 FTEs). There is no estimated direct impact on Timaru's employment.

**Table 8.7: Direct employment impacts by farm type in the Mackenzie and Timaru Districts, in FTEs, per annum, Scenario 2025.**

	Dairy Farming	Dairy Support	Sheep, Beef and Grain Farming	Total
<b>Mackenzie</b>	6	0	2	7
<b>Timaru</b>	0	0	0	0

Note: Figures may not always sum to the stated total(s) due to rounding.

- 8.12 Table 8.8 shows the number of FTEs associated with the total impact from the water restrictions that apply from 2025 (Scenario 2025). It is estimated that the total contribution to employment from the proposed changes was a drop of 9 FTEs annually in the Mackenzie District with the largest total fall estimated for the dairy sector (7 FTEs), followed by sheep, beef and grain farming with 2 FTEs. For Timaru, the total contribution to employment from the plan change was a fall of 0.8 FTEs in Scenario 2025. For Canterbury and New Zealand, the total employment impact was estimated at 13 FTEs and 17 FTEs, respectively. The employment multipliers are averages and are a coarse measure of the impact on employment. If as stated above there is a change in land use from, for example, dairying to dairy support and or sheep and beef they are likely to underestimate the impact on employment. Also, individual farmers will be making decisions regarding their employment levels perhaps increasing their own workloads as financial constraints arise, and this is not reflected here. The actual employment impact associated with the changes could therefore be more severe than I have estimated.

**Table 8.8: Total employment impacts by farm type in the Mackenzie and Timaru Districts, Canterbury and New Zealand, in FTEs, per annum, 2025.**

	Dairy Farming	Dairy Support	Sheep, Beef and Grain Farming	Total
<b>Mackenzie</b>	7	0	2	9
<b>Timaru</b>	0	0.3	0.5	0.8
<b>Canterbury</b>	10	0	2	13
<b>New Zealand</b>	14	0	3	17

Note: Figures may not always sum to the stated total(s) due to rounding.

### **Scenario 2030**

#### Economic Effects

- 8.13 The tables below show the direct impact on output (that is the aggregated farm gross income) by farm sector in the four catchments zones, the Mackenzie and Timaru Districts, Canterbury and New Zealand in Scenario 2030 (i.e. minimum flow restrictions that apply from 2030). This is followed by the estimates of the indirect and induced impacts and then the total impact on the farming sectors in the Mackenzie and Timaru Districts, Canterbury and New Zealand in Scenario 2030.
- 8.14 As shown in Table 8.9, in Scenario 2030, the direct economic impact that is the aggregated farm gross income has been estimated for the four catchments was estimated to fall by \$2,596,927, with the largest drop estimated for the dairy farming sector (\$2,084,058), then sheep, beef and grain farming (\$462,796). With regards to the catchment zones, South Opuha has the largest drop in aggregated farm gross income estimated at \$1,620,355, followed by Upper Opihi at \$564,511, then \$392,781 for Te Ana Wai and North Opuha with \$19,280.

**Table 8.9: Direct output impacts by farm type by catchment zone, in NZ\$, per annum, 2030.**

	North Opuha (M)	South Opuha (M)	Te Ana Wai (M/T)	Upper Opihi (M)	TOTAL
<b>Dairy Farming</b>	0	1,352,593	271,656	459,809	2,084,058
<b>Dairy Support</b>	0	0	50,073	0	50,073
<b>Sheep, Beef and Grain Farming</b>	19,280	267,762	71,052	104,702	462,796
<b>Total</b>	19,280	1,620,355	392,781	564,511	2,596,927

Note: Mackenzie District (M); Timaru District (T).

Figures may not always sum to the stated total(s) due to rounding.

- 8.15 Overall, estimates show that the total economic impact that is the contribution to output for the Mackenzie District was a loss of \$3,185,951, for Timaru District \$227,715, for Canterbury \$4,959,155 and for New Zealand \$6,039,607 in Scenario 2030 (Table 8.10).

**Table 8.10: Direct, indirect and induced output impacts in the Mackenzie and Timaru Districts, Canterbury and New Zealand, in NZ\$, per annum, Scenario 2030.**

	Direct	Indirect	Induced	Total
<b>Mackenzie</b>	2,475,803	264,503	445,644	3,185,951
<b>Timaru</b>	121,125	29,070	77,520	227,715
<b>Canterbury</b>	2,596,928	1,525,756	836,471	4,959,155
<b>New Zealand</b>	2,596,928	2,055,399	1,387,281	6,039,607

Note: Figures may not always sum to the stated total(s) due to rounding

- 8.16 Tables 8.11 - 8.14 show the direct, indirect, induced and total output effects by farm type for the Mackenzie and Timaru Districts, Canterbury and New Zealand under Scenario 2030. As mentioned above, estimates of direct output impacts for the different farm types in the Mackenzie District was the largest for the dairy farming sector (\$2,084,058), and sheep, beef and grain farming (\$391,744). Estimates of direct output impacts for the different farm types in Timaru District was the largest for sheep, beef and grain farming (\$71,052), then dairy support (\$50,073) (see Table 8.11).



- 8.17 As shown in Table 8.12, indirect output impacts in Scenario 2030 total \$264,503 for the Mackenzie District, \$29,070 for Timaru District, \$1,525,756 for Canterbury and \$2,055,399 for New Zealand.
- 8.18 Estimates for the induced output impacts for the Mackenzie District are \$445,644, for Timaru District \$77,520, for Canterbury \$836,471 and \$1,387,281 for New Zealand for Scenario 2030 (see Table 8.12). Hence, the total economic effects for the Mackenzie District are estimated at \$3,185,950, for Timaru District at \$227,715, for Canterbury at \$4,959,154 and for New Zealand at \$6,039,607 (see Table 8.13).
- 8.19 The largest total impact is estimated for dairy farming, followed by sheep, beef and grain farming, then dairy support in the Mackenzie and Timaru Districts, Canterbury and New Zealand.

**Table 8.11: Direct output impacts by farm type in the Mackenzie and Timaru Districts, in NZ\$, per annum, 2030.**

	<b>Dairy Farming</b>	<b>Dairy Support</b>	<b>Sheep, Beef and Grain Farming</b>	<b>TOTAL</b>
<b>Mackenzie</b>	2,084,058	0	391,744	2,475,802
<b>Timaru</b>	0	50,073	71,052	121,125
<b>DISTRICTS</b>	2,084,058	50,073	462,796	2,596,927

Note: Figures may not always sum to the stated total(s) due to rounding.

**Table 8.12: Indirect output impacts by farm type in the Mackenzie and Timaru Districts, Canterbury and New Zealand, in NZ\$, per annum, 2030.**

	<b>Dairy Farming</b>	<b>Dairy Support</b>	<b>Sheep, Beef and Grain Farming</b>	<b>TOTAL</b>
<b>Mackenzie</b>	229,246	0	35,257	264,503
<b>Timaru</b>	0	12,018	17,053	29,070
<b>Canterbury</b>	1,146,232	37,054	342,469	1,525,756
<b>New Zealand</b>	1,563,044	48,070	444,285	2,055,399

Note: Figures may not always sum to the stated total(s) due to rounding.

**Table 8.13: Induced output impacts by farm type in the Mackenzie and Timaru Districts, Canterbury and New Zealand, in NZ\$, per annum, 2030.**

	Dairy Farming	Dairy Support	Sheep, Beef and Grain Farming	TOTAL
<b>Mackenzie</b>	375,131	0	70,514	445,644
<b>Timaru</b>	0	32,047	45,474	77,520
<b>Canterbury</b>	687,739	14,521	134,211	836,471
<b>New Zealand</b>	1,146,232	23,534	217,514	1,387,281

Note: Figures may not always sum to the stated total(s) due to rounding.

**Table 8.14: Total output impacts by farm type in the Mackenzie and Timaru Districts, Canterbury and New Zealand, in NZ\$, per annum, 2030.**

	Dairy Farming	Dairy Support	Sheep, Beef and Grain Farming	TOTAL
<b>Mackenzie</b>	2,688,435	0	497,515	3,185,950
<b>Timaru</b>	0	94,137	133,578	227,715
<b>Canterbury</b>	3,918,029	101,648	939,477	4,959,154
<b>New Zealand</b>	4,793,334	121,677	1,124,595	6,039,607

Note: Figures may not always sum to the stated total(s) due to rounding.

### Employment Impacts

- 8.20 The tables below show the direct impact on employment in the three farming sectors from proposed changes that apply from 2030 (Scenario 2030) as well as the total impact which comprises direct, indirect and induced impact in the same scenario.
- 8.21 As shown in Table 8.15, it was estimated that direct employment impact was a loss of 10 FTEs per annum in the Mackenzie District, with the largest direct impact estimated for the dairy farming sector (-8 FTEs), followed by sheep, beef and grain farming with a loss of 3 FTEs annually. In the Timaru District, employment is estimated to drop by 0.7 FTE annually.

**Table 8.15: Direct employment impacts by farm type in the Mackenzie and Timaru Districts, in FTEs, per annum, 2030.**

	Dairy Farming	Dairy Support	Sheep, Beef and Grain Farming	Total
<b>Mackenzie</b>	7.7	0.0	2.6	10.3
<b>Timaru</b>	0.0	0.3	0.4	0.7

8.22 Table 8.16 shows the loss of FTEs associated with the total impact from the water restrictions that apply from 2030 (Scenario 2030). It is estimated that the total contribution to employment from the plan change is an annual drop of 13 FTEs in the Mackenzie District, with the largest total impact on the dairy farming sector (10 FTEs) and 3 FTE in sheep, beef and grain farming sectors. In Timaru District, total employment is estimated to fall by 1.2 FTEs. For Canterbury and New Zealand, the total employment impacts are estimated to fall by 18 FTEs and 24 FTEs, respectively.

**Table 8.16: Total employment impacts by farm type in the Mackenzie and Timaru Districts, Canterbury and New Zealand, in FTEs, per annum, 2030.**

	Dairy Farming	Dairy Support	Sheep, Beef and Grain Farming	Total
<b>Mackenzie</b>	10	0	3	13
<b>Timaru</b>	0	0.5	0.7	1.2
<b>Canterbury</b>	14	0	4	18
<b>New Zealand</b>	18	1	5	24

## 9. IMPLICATIONS OF THE SECTION 42A REPORT RECOMMENDATIONS

9.1 I understand that the Section 42A Report<sup>7</sup> recommends changes to the timeframes for implementation of Scenario 2025 and Scenario 2030. This would have the effect of bringing forward the assessed economic impacts reported in the previous section of my evidence such that:

<sup>7</sup> As set out in the 26 June 2020 version of Appendix E.1 of the Section 42A Report.  
GH-148305-1-4147-V1

- (a) For South Opuha, the economic impacts under Scenario 2030 would be experienced at 2025;
- (b) For Upper Opihi, the assessed economic impacts under Scenario 2025 would be experienced at the time PC7 becomes operative and the assessed economic impacts under Scenario 2030 would be experienced at 2025;
- (c) For Te Ana Wai, the economic impacts under Scenario 2030 would be experienced at the time PC7 becomes operative.

## **10. HARRIS REPORT**

10.1 In this section, I provide some general comments on the Harris report.

10.2 The results reported in the Harris report with respect to estimated economic impacts on OWL shareholders in the four sub-catchments I have also modelled differ from those presented in my evidence. I agree with the view Mr Porter has expressed in his evidence that this is mainly due to the different impact on farm revenue, and related assumptions used in Mr Harris' modelling. This includes use of the multipliers for the Waimakariri District, whereas my modelling relies on multipliers calculated for the actual districts in the report. I also agree with Mr Porter's comment that the results presented in the Harris report are likely to be affected by these factors, in combination, and understate the economic impacts.

10.3 The results presented in the Harris report with respect to regional economic impacts also differ to those presented in my evidence as they are reported as contributions to GDP, whereas my modelling looks at the impact on output. Therefore, they are likely to be lower as GDP is value added not the full impact on output. The Harris results are therefore unable to be directly compared with mine, however, with respect to the other results, I note that:

- (a) There are considerable differences between the direct economic impacts for the 2030 Scenario (referred to as "on-farm operating profit" in the Harris Report), and on the basis of the above comments, I consider that the Harris results are likely to underestimate these impacts.

(b) The Harris results with respect to employment impacts are similar to those reported in my evidence. However, as I have noted earlier in my evidence, the modelling is unable to account for landowner choices with respect to employment on farm, so the figures presented in both the Harris report and my evidence may underestimate the actual impact.

10.4 Finally, the Harris report (at page 6) records that the “*regional IO modelling tends to overestimate the total impact of land use change because it does not include feedback effects, but is computationally simpler and less reliance on estimated functions in the absence of reliable data*”. I agree with this statement, however it is not possible due to data limitations to undertake a full general equilibrium model of small regions. The accuracy of input- output models is expected to be lower for smaller regions but reasonable reliable for the larger regions such as Canterbury. The New Zealand table is compiled by Statistics NZ and therefore is fairly robust.

## **11. CONCLUSION**

11.1 This analysis assesses the economic impacts of changes to minimum flow and partial restriction regimes on three farming systems within four catchment zones (i.e., North Opuha, South Opuha, Upper Opihi and Te Ana Wai) on district, region and national levels. Two different scenarios were modelled: minimum flow and partial restriction regimes that apply from 2025 (Scenario 2025); and minimum flow and partial restriction regimes that apply from 2030 (Scenario 2030).

11.2 Results from the modelling show that the proposed changes are estimated to decrease contribution to output and employment in the Mackenzie and Timaru Districts, Canterbury and New Zealand under both scenarios.

11.3 The economic analysis of the Mackenzie District shows that the impact on direct output which is the aggregated farm gross income is estimated as a loss of \$1,779,417 and the negative impact on total contribution to output is \$2,290,485 annually under Scenario 2025. In Scenario 2030, the drop in aggregated farm gross income in the Mackenzie District totals \$2,084,058 annually and the total contribution to output is a drop of \$3,185,951 per annum. The largest impact is in South Opuha.

- 11.4 With regards to the direct economic impact by farming type, the analysis shows that dairy farming is affected the most in both, Scenario 2025 and Scenario 2030 with the largest negative impact on contribution to output.
- 11.5 For Timaru District, the fall in farm gross income is estimated to be \$76,234 per annum and the negative impact on total contribution to output is \$143,321 under Scenario 2025. In Scenario 2030, the direct economic impact Timaru District is \$121,125 and the impact on total contribution to output is a drop of \$227,715 annually.
- 11.6 The total impact on output in Canterbury and New Zealand is estimated to be \$3,537,284 and \$4,310,169 per annum respectively in Scenario 2025. In Scenario 2030, the total impact on output for Canterbury and New Zealand is estimated to be \$4,959,155 and \$6,039,607 respectively.
- 11.7 The impact on employment in the Mackenzie District is estimated to drop annually by 7 FTEs (direct impact) and 9 FTEs (total impact) in Scenario 2025. In Scenario 2030, the direct employment impact for Mackenzie District is predicted to be a fall of 7 FTEs per annum and total employment impact is a fall of 9 FTEs per annum. In both scenarios, the districts' dairy farming sector is affected the most by the fall in employment. In Timaru, the total employment effects are much smaller, as expected, at 0.8 FTE annually in Scenario 2025 and 1.2 FTE annually in Scenario 2030.
- 11.8 The total employment impact for Canterbury and New Zealand is estimated to be an annual drop of 13 FTEs and 17 FTEs, respectively (Scenario 2025) and at 18 FTEs and 24 FTEs, respectively (Scenario 2030).
- 11.9 The results presented in my evidence in terms of overall economic and employment impacts may underestimate the actual effect of the proposed changes to minimum flow and partial restriction regimes. This is because the model I have used is unable to account for effects associated with changes in farming type/land use due to current farm types becoming unviable (as discussed in Mr Porter's evidence) as a result of the regime changes, and landowner decisions about employment on farm due to their own financial circumstances.

- 11.10 Section 42A Report recommends changes to the timeframes within which the proposed increases in minimum flows and partial restriction regimes under PC7 would be implemented. If such changes were confirmed, the economic impacts reported would likewise occur sooner.
- 11.11 Covid 19 has and is having a seriously detrimental impact on the New Zealand and world economy. The agricultural sector has been the underpinning of the economy since the commencement of lockdown, with exports being maintained and ensuring the economic impacts of Covid 19 are reduced. Thus, the impact of reducing agricultural output at this time with limited other opportunities to earn foreign exchange is a very important consideration for PC7.

**CAROLINE MARY SAUNDERS**

17 July 2020