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# Level 3 Agricultural and Horticultural Science, 2018

## 91532 Analyse a New Zealand primary production environmental issue

2.00 p.m. Tuesday 27 November 2018  
Credits: Five

Achievement	Achievement with Merit	Achievement with Excellence
Analyse a New Zealand primary production environmental issue.	Critically analyse a New Zealand primary production environmental issue.	Comprehensively analyse a New Zealand primary production environmental issue.

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

**You should attempt ALL parts of the task in this booklet.**

If you need more room for any answer, use the extra space provided at the back of this booklet.

Check that this booklet has pages 2–8 in the correct order and that none of these pages is blank.

**YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.**

**Achievement**

**TOTAL**

**04**

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## INSTRUCTIONS

This assessment consists of ONE task, in TWO parts, which requires you to discuss the impact of the production of a specified agricultural or horticultural product on freshwater. Your answer should include the management practices that a producer of the selected product could implement to mitigate any negative impacts on freshwater.

Name of your selected agricultural/horticultural product:

milk (dairy)

## RESOURCE A

### Fixing freshwater issues is an "enormous challenge"

A report by New Zealand's top scientist has urged politicians to address freshwater issues, which he says are clearly linked to intensive farming and urbanisation. Professor Sir Peter Gluckman, Chief Science Advisor to the Prime Minister, has released a report analysing the health of New Zealand's freshwater based on existing science and data. It found clear evidence the freshwater estate was under pressure in terms of both water quality and quantity. There was a link between farming and declining water quality in pastoral areas, and contamination of urban waterways by expanding cities.

"New ways of utilising our land for economic gain that also have lower environmental footprints need to be found and adopted if we are to meet the vision New Zealanders have for their freshwaters," said Gluckman.



Text source (adapted): <http://www.stuff.co.nz/environment/91418638/Top-scientist-Fixing-freshwater-issues-an-enormous-challenge>.

Image source: <https://pxhere.com/en/photo/1026654>.

## PART A

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Explain the negative social and environmental impacts on New Zealand's freshwater that might result from producing your selected product.

Environmental <sup>negative</sup> impacts from dairy farming include increase in Nitrogen leaching through the ground into watertables and finally into rivers + streams. This is caused by urination patches from cows where their urine contains 850N/kg which is equivalent to <sup>close</sup> 1,500 kg Urea in that patch. Because it is so concentrated and well over the amount needed by pastures, it is then ~~carried~~ seeped through the ground where it causes algal bloom and nitrification in our waterways and in extreme cases can cause "Blue babies". Another way it is caused is through fertiliser overuse in wet conditions, where fertiliser is applied when pastures are waterlogged and cannot use up the fertiliser and so it is carried through into waterways. These impacts then cause waterways to become dirtier and less clear which prevents plants growing deeper and so affecting and limiting the food available for our fresh water species such as trout, eel and freshwater crayfish.

More space for this answer  
is available on the next page.



Social impacts are caused through the environmental impacts like algal bloom where e.coli is in NZ's freshwaterways and so the people cannot enjoy recreational activities such as skiing and boating because it is either unsafe or too dirty. Also because of the decline in food for fresh water species means less food is able to be caught by like trout, whitebait and eel. Also because of the strong Maori heritage and significance of water to them, means more social conflict in communities between farmers and local iwi as Maori and my matai believe "the river is us and we are the river"

## RESOURCE B

ASSESSOR'S  
USE ONLY**Farming leaders pledge to make all New Zealand rivers swimmable**

Farming leaders representing 80 per cent of the industry have pledged to make all New Zealand rivers swimmable. Confessing that not all rivers were in the condition they wanted them to be, and that farming had not always been right, the group said the vow was "simply the right thing to do".



Image: Michael Spaans, Bruce Wills, Federated Farmers president Katie Milne, Mike Petersen, Carolyn Mortland (Fonterra), John Loughlin, and James Parsons at the Ngaruroro River in Hawke's Bay.

Text source (adapted): <https://www.stuff.co.nz/business/farming/96026220/farming-leaders-pledge-to-make-all-nz-rivers-swimmable>.

Image source: <http://www.shersonwillis.com/wp-content/uploads/2017/08/Farming-leaders-have-pledged-to-help-make-New-Zealand%E2%80%99s-rivers-swimmable-for-future-generations.jpg>.

plantain/chicory crop  
wetlands

**PART B**

Evaluate at least TWO courses of action that a primary producer of your selected product could implement to minimise negative effects on water quality, and justify which course of action you believe would be the most viable towards the pledge to make all New Zealand rivers swimmable.

In your answer:

- discuss the conflicts or challenges that may currently exist between increasing production and the commitment to make all New Zealand rivers swimmable in the future (*Note: conflicts or challenges could be economic, cultural, social, technological, or environmental*)
- use data and evidence to support your claim.

~~Write~~ one course of action that a producer could implement would be the use of a better water utilisation crop instead of grass pastures in some paddocks. Crops like a plantain/chicory



Mix would largely <sup>decrease</sup> ~~benefit~~ the environmental issue associated with water as it better utilises the water because it has deeper roots in which means less irrigation is needed in the so dry period. Although these crops can be productive, the conflict around this is that farmers can use a cheaper crop that <sup>increase</sup> ~~decrease~~ will increase the farms production more but ~~decrease~~ the environmental impact.

another course of action is that a producer could fence off and plant wetlands in the most waterlogged parts. This largely decreases the environmental impact as denitrifying bacteria and plants stop harmful unwanted nutrients from entering our water ways, however this has a negative impact on production as less land and thus less pasture is available to stock which is where the challenge comes from. ~~as~~ I think that planting better crops and replacing old pastures is a more suitable management practise than retiring land for wetlands as this has no economic gain for farmers and so they are ~~are~~ less likely to do it.

The conflict arises as farmers are thinking about some practises where they help the environment but get ~~no~~ no production ~~the~~ <sup>gains</sup> sometimes less and so they cannot afford some management practises.

## Achievement Exemplar 2018

Subject	Level 3 Agricultural and Horticultural Science		Standard	91532	Total score	04
Q	Grade score	Annotation				
1	A4	<p>Both negative social and environmental impacts are discussed, but very broadly and without a great deal of depth. Some references to a quote from a speaker is included, but no detail is given.</p> <p>Two valid courses of action are suggested and described, but there are no comparisons between the two directly. There are descriptions of how the practice might assist in reducing effects on waterways, but no data or figures to back it up. A brief mention of conflict.</p>				