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91532



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NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

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SUPERVISOR'S USE ONLY

Level 3 Agricultural and Horticultural Science, 2015

91532 Analyse a New Zealand primary production environmental issue

9.30 a.m. Monday 30 November 2015
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 BOTH 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 2–12 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

3

ASSESSOR'S USE ONLY

INSTRUCTIONS

This paper consists of ONE task, in TWO parts (A and B), which requires you to analyse water storage and irrigation as a New Zealand primary production environmental issue.

PART A

RESOURCE FOR PART A

The Blue Springs



New Zealand's natural freshwater resources underpin the Kiwi outdoor lifestyle and our "clean and green" brand.

The adverse effects of agricultural intensification are well understood, and are unambiguously evident in the ongoing deterioration of water quality and quantity in an increasing number of waterways.

The irrigation industry wants to see the estimated 650,000 hectares of irrigated land increased to in excess of a million hectares within the next two decades.

Image source: <http://www.gottalovenz.com/experience/the-blue-springs/>

Discuss the economic, environmental, and social impacts arising from the **use of irrigation** in agricultural and horticultural production systems.

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The economic impacts for the use of irrigation: The cost of purchasing and maintaining irrigation systems is very costly. Although the use of irrigation also helps with more growth and production on the farm. Environmental impacts are that the irrigation can leach through the soil, in turn making its way to water ways and polluting them. Social impacts could be that if the slope of land and water table goes towards ~~neighbouring~~ neighbouring farms, they could get buildups of the farms irrigation, ~~as~~ (where they do not want it) therefore the original farm will have an impact socially on their neighbours.

(Environmental, economic and social)

When irrigation is entered into the waterways ~~it~~ it can cause build ups of nutrients in the water causing unwanted weeds and algae to grow ~~and~~ being harmful ~~to~~ to aquatic life in the waterways. ~~It can~~ The irrigation can also smother the beds of the waterways destroying the habitat for a lot of our species (aqua)

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

occupying our streams, creeks and rivers. Not only does it have an effect on this but also makes the waterways unsafe for people to swim in and gather food from. If one farm is ~~polluting~~ polluting waterways it will have an effect on all of their downstream neighbours as well. Effects could be water is no longer suitable for stock drinking water which could cause major social and economic problems as neighbours will be very ~~and~~ annoyed and could be forced into spending money on water for the stock and themselves. Another economic impact of the farmer could be getting fines for pollution and carelessness of how they handle their waste and irrigation. Effects on the waterways are very long term and if pollution has had major effects of the waterways it will take a lot of time and money to bring it back to the way it was.

This examination continues
on the following page.

PART B

RESOURCE FOR PART B

Opuha dam in normal conditions



Opuha dam in drought conditions



The Opuha Dam was planned to drought-proof a large area of South Canterbury for many years. However, the recent 2014 / 2015 summer drought was severe enough to halt all access to water into and out of the dam for a period of time.

Opuha has been lauded by politicians. It provides water for farms, an environment for aquatic life, a place for recreation, and minimum flows to the formerly summer-dry Opihi River.

Federated Farmers President Bruce Wills has said that New Zealand is on track to double primary exports to NZ\$64 billion by 2025 "so long as we stick to a sensible and sustainable mix of policies."

"Between now and 2025, NZ\$18 billion of this future growth is expected to come from water storage, irrigation, and aquaculture. New Zealand does not lack water as in Australia – just the means to store it in times of plenty, to use it in times of shortage," Wills said.

Source of text (adapted) and images: <http://www.interest.co.nz/rural-news/63700/bruce-wills-says-it-vital-we-store-water-irrigation-and-use-dry-periods-stored-water> (accessed 9 October, 2014)

"If water storage schemes are to provide for greater agricultural intensification, it must be at no further harm to the natural environment, which has already suffered too much damage."

"Therefore, Fish & Game supports water storage for agricultural use, provided both the direct and indirect freshwater environmental effects are benign."

Source (adapted): <http://www.fishandgame.org.nz/water-storage-irrigation>

A key issue for discussion during the 2014 General Election was the availability and quality of water associated with increasing agricultural intensification in New Zealand.

ASSESSOR'S
USE ONLY

Justify the use of water storage schemes, like the Opuha Dam, over other water extraction options, such as bore water and pumping directly from rivers and tributary streams.

In your answer, evaluate various stakeholder viewpoints and the environmental impacts.

Water storage schemes such as Opuha Dam are a very successful system to use. Having such a large plain of water allows for a clean and harder to pollute system. Having a large area like this ~~not~~ means there is less ~~of~~ flow and current than a normal river or stream which means there is a lot less bank erosion which in turn can pollute water if there is a lot of bank erosion. This is a lot more effective than other water extraction options such as bore water, as bore water can be very susceptible to contain pollution and a lot of nutrients and bacteria. Whatever harmful chemicals, nutrients and faecal matter your farm is putting into the ground and water table, it can be found in your bore water system.

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

supply. Especially if irrigation, fertiliser or just grazing stock are on an uphill slope from your water supply. Also pumping water directly from rivers and tributary streams can have an effect on the water levels and flow. If there is less water there will be less habitat and environment for aquatic species. When chemicals and other harmful things are leached into the water systems, the more water the water ways are holding, the more dilute the concentrations will be which could be the matter of life or death for ~~any~~ aquatic species. Rivers and streams are usually natural and are not made for ~~any~~ large amounts of water to be pumped from them. Some can't handle it and get completely wrecked for all uses ~~in~~ it previously had. Where ~~any~~ schemes like the Opuha Dam are made to handle large amounts of water to be extracted whilst still maintaining a livable habitat for aquatic species. This ~~is~~ allows the dam to be used for all sorts of purposes (recreation, agricultural and horticultural).

All of the topsoil erosion and leaching can have a major impact on the purity of the water in ~~the~~ streams and rivers which is another reason why the dam can be the safer and ~~best~~ friendlier option.

Achievement exemplar for 91532 – 2015		Total score: 3
Grade score	Annotation	
A3	The candidate explained positive and negative environmental, social, and economic impacts that irrigation schemes contribute to. There was a reference to other storage options, but the detail was brief. No figures used to back up statements. The candidate provided enough information for Achievement, but a more detailed explanation of the water storage scheme was needed for a Merit grade.	