

## SUBMISSION ON AN APPLICATION FOR RESOURCE CONSENT UNDER SECTION 95 (a) OF THE RESOURCE MANAGEMENT ACT 1991

To: Environment Southland  
Cnr North Rd and Price St  
Waikiwi  
Invercargill 9810

Submitters name: Public Health South on behalf of Southern District Health Board

1. The application is by Woldwide One Limited for a resource consent to discharge dairy shed and wintering barn effluent from up to 800 cows by travelling irrigator for a period of 10 years. Up to 91,000 litres of ground water will be taken per day from a bore in the Waimatuku Groundwater Zone. The proposal is a discretionary activity under Rule 35[c] of the proposed Southland Water and Land plan.
2. This submission relates to the permit to discharge dairy shed and wintering barn effluent to land from up to 800 cows by travelling irrigator.
3. Public Health South notes the application proposes a 32% increase in cow numbers from 540 to 800 in a catchment where the adverse effects of intensification are clearly indicated by nitrate levels in groundwater.
4. The proposed Southland Water and Land plan (pSWLP)

*"..... has been developed by Environment Southland under the Resource Management Act 1991 (RMA). This Plan is intended to provide direction and guidance regarding the sustainable use, development and protection of water and land resources in the Southland region. This Plan fits within, and is influenced by an RMA framework of national, regional and local policy documents".*

There are 18 objectives outlined in the pSWLP and attention is drawn to objectives 1 and 6 outlined here for ease of reference:

### **Objective 1**

*Land and water and associated ecosystems are managed as integrated natural resources, recognising the connectivity between surface water and groundwater, and between freshwater, land and the coast.*

### **Objective 6**

*There is no reduction in the quality of freshwater, and water in estuaries and coastal lagoons, by:*

- (a) maintaining the quality of water in waterbodies, estuaries and coastal lagoons, where the water quality is not degraded; and*
- (b) improving the quality of water in waterbodies, estuaries and coastal lagoons, that have been degraded by human activities.*

### **Water Quality**

5. Setting limits for water quality and quantity is one of the requirements for all regional councils under the Government's National Policy Statement for Freshwater Management. Limits include restricting the amount of contaminants that can be discharged into waterways and how much water can be removed (extracted). The limit setting process is the third main component of your Water and Land 2020 and Beyond project<sup>1</sup>. Public Health South suggests that strong

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<sup>1</sup> Environment Southland 2015 Water and Land and Beyond 2020. At <http://waterandland.es.govt.nz/setting-limits>

consideration be given to not granting this application until proposed catchment limit setting processes are completed to ensure achievement of the objectives.

6. Levels of nitrate in groundwater used for drinking have been monitored for many years with an increasing trend noted across many parts of Southland including the locality of the applicant as shown in the attached risk map (Appendix 1). Objective 6 of the pSLWP is for no reduction in freshwater quality but this will only be achieved through the reduction of nitrogen inputs. High nitrate levels in drinking water have been known to cause Methaemoglobinaemia or Blue Baby Syndrome in infants less than six months of age and the unborn foetus of pregnant women through exposure to high nitrate levels.<sup>2</sup> An analysis of monitoring of consented bores within a 2.5km radius of the applicant's property has indicated an average nitrate concentration of 9.5g/m<sup>3</sup> since sampling began in 1996. This is well in excess (and we understand the highest<sup>1</sup>) against the background nitrate levels in Southland of 0.4-1.0g/l that are seen appropriate for modern day background levels showing only diffuse inputs of NO<sub>3</sub>-N from human activity<sup>3</sup>. While the applicant has provided commentary as to how this proposal relates to the water from Heddon Bush School, they have not considered their operation in relation to any other domestic drinking water takes or its contribution to the total nitrogen loading of the catchment.
7. The Assessment of Environment Effects noted the natural watercourse the Bog Burn originates from the property. It is also noted there is a hydraulic connection between groundwater on the property and the Bog Burn. The Bog Burn is a tributary to the Oreti River. It is noted the Oreti River in the vicinity of the Bog Burn is categorised as being in the worst 25% of rivers of its category for total nitrogen, total oxidised nitrogen, dissolved reactive phosphorous, total phosphorous and E.coli. We also note the trend for these parameters is ongoing meaningful degradation. This clearly does not align with Objective 6 of the pSWLP.
8. The Ministry for the Environment recently commissioned an assessment of the quality of coastal waters across New Zealand. A key finding of the report for Southland was that due to the current magnitude of land use across the region, seawater off Oreti beach is now no longer nitrogen limited and as such the risk of Harmful Algal Blooms (HAB) has increased markedly. Aalgal blooms have been reported from Oreti Beach<sup>4</sup>. Internationally, there is a strong correlation between eutrophication of coastal waterways and the incidence of paralytic shellfish poisoning, neurotoxic shellfish poisoning, amnesic shellfish poisoning, ciguatera fish poisoning and various other HAB phenomena such as fish kills, loss of submerged vegetation, shellfish mortalities, and widespread marine mammal mortalities. Given Oreti is the only site with long term monitoring, it is hard to know if the near coastal environments associated with the discharges from the Maitai and Aparima River are also no longer limited with regard to nitrogen. If nitrogen is no longer limited at other beaches impacted by these rivers, we have now greatly increased the risk of HAB.

### ***Disease Risk***

9. More cattle will produce more effluent and higher loads of micro-organisms including pathogenic organisms such as Campylobacter, Cryptosporidium, Giardia, and Salmonella. These leach into the ground with irrigation and move into the aquifers. Drinking water from ground bores can no longer be considered secure as evidenced by the campylobacter outbreak in Havelock North in August 2015. Findings from the stage 2 inquiry were that '...the vast majority of New Zealand's waterborne disease burden arises not from significant outbreak events... but from underlying sporadic waterborne illness that is never linked to a particular

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<sup>2</sup> Canterbury District Health Board (2013). Nitrate in Drinking Water "Blue Baby" Syndrome.

<sup>3</sup> Rissmann 2012 The Extent of Nitrate in Southland Groundwaters Regional 5 Year Median (2007-2012 (June)) Technical Report

<sup>4</sup> Environment Southland: Nick Ward, Coastal/Marine Scientists pers. communication

outbreak. It is estimated that some 18,000 to 100,000 people become ill in this way from consuming drinking water every year...<sup>5</sup>

10. Local notifiable disease surveillance data shows high rates of these infections in Southern region compared to NZ as a whole (Appendix 2). This is an undercount as many cases go undetected for a variety of reasons. Public Health submits that an increase in cows in this catchment will add pathogens to the ecosystem that in turn will add to the increasing burden of illness and that the applicant has not taken this sufficiently into consideration in the proposed mitigations.
11. The issue of antibiotic resistance has been raised as one of six new environmental issues of 2017 by the United Nations. According to the World Health Organization, we may be entering a post-antibiotic era when previously treatable bacterial infections can kill and routine medical procedures that rely on antibiotic preventative treatment will no longer be possible. Once consumed, most antibiotic drugs are excreted unmetabolized, along with resistant bacteria. They can then pass either through sewage systems or more directly into water and soils, and mix with environmental bacteria in the presence of other pollutants that may add further pressure to help select for antibiotic resistance. This principle applies in agriculture as it does in human settings. Although the use of antibiotics as a livestock growth promoter has not been practiced in New Zealand, antibiotics are still used to treat animal health conditions and there is a high probability there will be bacteria in the environment relating to this application that have developed resistance to antimicrobial residues<sup>6</sup>.

### ***Soil Characteristics***

12. The shrinking and cracking characteristics associated with the high permeability Braxton soil types are the same as those that impacted the Havelock North Community<sup>7</sup>. These soils are prone to shrinking and cracking during drier months allowing nitrates and other contaminants to leach directly to underlying groundwater<sup>8</sup>. We understand this application is based on the use of Overseer<sup>®</sup> that does not apply well to the soil types applicable to this application<sup>9</sup>.
13. This submitter is neutral and neither supports or opposes this application. We are only concerned that adequate conditions are accepted to protect public health.
14. The decision sought in the event that consents are granted, is the imposition of adequate conditions related to the mitigation of potential human health risks as described:
  - (i) Efforts need to be undertaken to remove E.coli and pathogens from effluent. We understand Ozone is used in similar applications in other jurisdictions. This or similar mechanisms should be used as a way of removing pathogens from the effluent.
  - (ii) Specific compliance monitoring bores are established on the property that represent an adequate reflection of groundwater quality that is impacted by the operation. As such these bores need to be shallow and at a depth that reflect water from an unconfined aquifer.
  - (iii) Bores need to be sampled at the beginning, middle and end of the recharge period. Analytes need to include nitrate, nitrogen and E-coli as a minimum.
  - (iv) The consenting authority (ES) should review Waimutuku Catchment early in the coming Catchment Limit Setting process and consider withholding consent for this application until it has been completed.

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<sup>5</sup> Havelock North enquiry proceedings 2017 paragraph 82 at [https://www.dia.govt.nz/diawebsite.nsf/Files/Report-Havelock-North-Water-Inquiry-Stage-2/\\$file/Report-Havelock-North-Water-Inquiry-Stage-2.pdf](https://www.dia.govt.nz/diawebsite.nsf/Files/Report-Havelock-North-Water-Inquiry-Stage-2/$file/Report-Havelock-North-Water-Inquiry-Stage-2.pdf)

<sup>6</sup> UN Environment 2017. Frontiers 2017 Emerging Issues of Environmental Concern

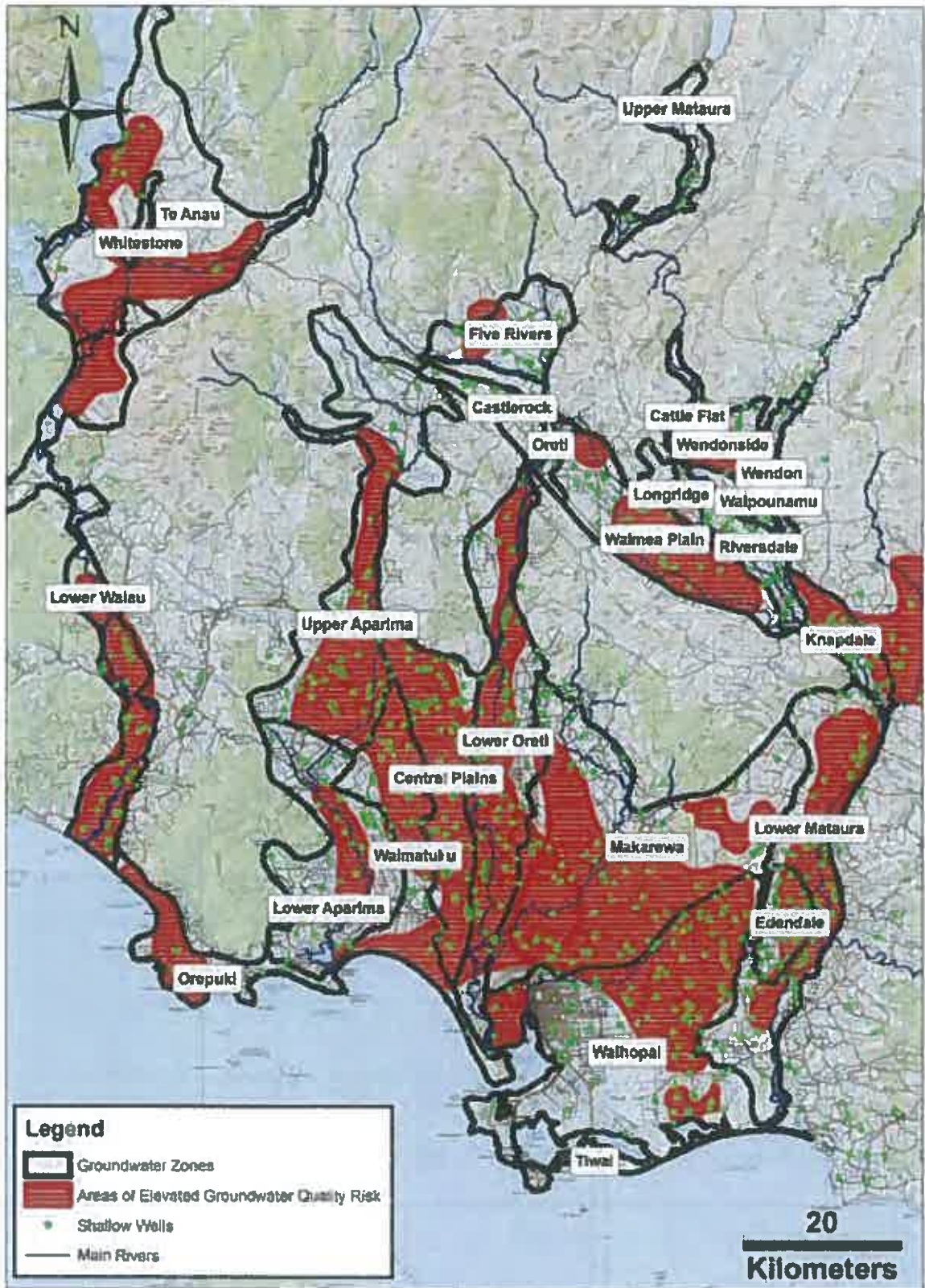
<sup>7</sup> Rissmann pers. communication Jan 2018

<sup>8</sup> Environment Southland. Central Plains Technical Information. *Water and Land 2020 & Beyond*

<sup>9</sup> Aqualink (2017) Assessment of Environmental Effects prepared for Woldwide One Ltd



Appendix 1  
Nitrate Affected Groundwater in Southland



## Appendix 2 Disease Notifications 2015 - 17

### Number of Cases for each Territorial Authority

Reporting Period: 1/01/2015 - 31/12/2015  
Public Health Service: Public Health South  
Office Selected: All

Disease Name	Territorial Authority								Total
	Waikato District	Central Otago District	Queenstown-Lakes District	Dunedin City	Clutha District	Southland District	Gore District	Invercargill City	
Campylobacteriosis	41	38	53	149	44	83	30	74	512
Chikungunya fever	1			1			1		3
Cryptosporidiosis	8		3	10	3	20	6	11	61
Dengue fever	1		1	2					4
Gastroenteritis - unknown cause			1	9				1	11
Gastroenteritis / foodborne intoxication				1					1
Giardiasis	2	11	39	11	1	5		3	72
Hepatitis A				1	1			1	3
Hepatitis C				3					3
Hepatitis NOS								1	1
Invasive pneumococcal disease	3	1	1	12	5	3		6	31
Legionellosis	1	1		9				1	12
Leprosy								1	1
Leptospirosis				1	1	4		2	8
Listeriosis				1					1
Malaria				1					1
Meningococcal disease			2	1		1			4
Paratyphoid fever			1	1					2
Pertussis	11	21	101	28	1	2		5	169
Ross River virus infection						1			1
Salmonellosis	9	19	13	59	2	14	5	15	136
Shigellosis	3		1	3					7
Tuberculosis disease - new case				2				4	6
Tuberculosis infection - on preventive treatment				1					1
Typhoid fever			1	1				1	3
VTEC/STEC infection	1	3	2	5	1	3		1	16
Yersiniosis	3	1	6	14	4	3		7	38
<b>Total:</b>	<b>84</b>	<b>95</b>	<b>225</b>	<b>326</b>	<b>63</b>	<b>139</b>	<b>42</b>	<b>134</b>	<b>1108</b>

EpiSurv data as at 19/01/2016 11:00:29 a.m. Generated by rccalaghan

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## Number of Cases for each Territorial Authority

Reporting Period: 1/01/2016 - 31/12/2016  
 Public Health Service: Public Health South  
 Office Selected: All

### Territorial Authority

Disease Name	Waikato District	Central Otago District	Queenstown-Lakes District	Dunedin City	Clutha District	Southland District	Gore District	Invercargill City	Total
Campylobacteriosis	54	42	63	164	53	81	28	82	567
Chikungunya fever		1							1
Cryptosporidiosis	10	5	7	19	4	8		6	59
Dengue fever	1	1	3	5					10
Gastroenteritis - unknown cause	1		2	10	1				14
Gastroenteritis / foodborne intoxication				2					2
Giardiasis	6	3	29	35	5	5	2	5	90
Hepatitis A		1	1	1					3
Hepatitis B			1	1					2
Hepatitis C				3					3
Invasive pneumococcal disease	2	2	3	7	1	4		6	25
Latent tuberculosis infection				3				1	4
Legionellosis			1	8		2		3	14
Leptospirosis				2		3		1	6
Listeriosis	1								1
Listeriosis - perinatal								1	1
Measles			1						1
Meningococcal disease	1		7	9		2			19
Mumps		1							1
Paratyphoid fever			1	2					3
Pertussis	2	1	9	35	5	3		7	62
Rheumatic fever - initial attack					1				1
Salmonellosis	10	9	23	32	6	9	5	14	108
Shigellosis		2	1	4					7
Tuberculosis disease - new case		1			1		4	1	7
Typhoid fever				1					1
VTEC/STEC infection	1	2	4	6	3	6	3	6	31
Yersiniosis	6		7	30	3	1		9	56

Episurvey data as at 19/01/2018 11:00:29 a.m. Generated by mcallaghan  
 \* Excludes 'Not a case'

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## Number of Cases for each Territorial Authority

Disease Name	Waikato District	Central Otago District	Queensland Lakes District	Dunedin City	Clutha District	Southland District	Gore District	Invercargill City	Total
Zika virus		1		1					2
<b>Total:</b>	<b>95</b>	<b>72</b>	<b>163</b>	<b>380</b>	<b>83</b>	<b>124</b>	<b>42</b>	<b>142</b>	<b>1101</b>

## Number of Cases for each Territorial Authority

Reporting Period: 1/01/2017 - 31/12/2017  
 Public Health Service: Public Health South  
 Office Selected: All

### Territorial Authority

Disease Name	Waikato District	Central Otago District	Queenstown-Lakes District	Dunedin City	Clutha District	Southland District	Gore District	Invercargill City	Total
Campylobacteriosis	61	55	103	227	72	104	39	83	744
Cryptosporidiosis	30	9	11	42	27	18	3	7	147
Dengue fever			1				1		2
Gastroenteritis - unknown cause				4			3		7
Gastroenteritis / foodborne intoxication				3		1		1	5
Giardiasis	6	3	39	23	5	9	4	4	93
Haemophilus influenzae type b								1	1
Hepatitis A				1				1	2
Hepatitis B				3					3
Hepatitis C	1			1	1				3
Hydatid disease						1			1
Invasive pneumococcal disease	2	2	2	12		3	1	10	32
Legionellosis	1	2		7	2	1		5	18
Leprosy	1								1
Leptospirosis				1		4		2	7
Malaria				2					2
Meningococcal disease	1		3	2				1	7
Mumps	7	6	1	33				1	48
Pertussis	4	32	45	81	5	10	3	55	235
Rheumatic fever - initial attack	2								2
Ross River virus infection			1						1
Salmonellosis	10	4	9	29	10	17	6	15	100
Shigellosis			7	8	1	1			17
Taeniasis				1					1
Tuberculosis disease - new case	1		2	3	1	1		1	9
Typhoid fever			1	1		2			4
VTEC/STEC infection	12	17	17	49	22	9	5	8	139
Yersiniosis	6	3	13	18	5	5	2	2	54

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\* Excludes 'Not a case'

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### Number of Cases for each Territorial Authority

Disease Name	Waikato District	Central Otago District	Queensown-Lakes District	Dunedin City	Clutha District	Southland District	Gore District	Invercargill City	Total
Zika virus			2						2
<b>Total:</b>	145	133	257	551	151	186	67	197	1687

- (v) We support conditions relating to the Farm Management Plan including the use of hard stand for wintering and wet weather, cut and carry proposals and that effluent (subject to condition (i) above) discharge shall not be at times of saturated soil or dry conditions where there are obvious cracks.

15. The reasons for this submission are to promote the reduction of adverse environmental effects on the health of people and communities, and to improve, promote and protect their health pursuant to the New Zealand Public Health and Disability Act 2000 and the Health Act 1956. These statutory obligations are the responsibility of the Ministry of Health and in the Southland District the obligations are carried out under contract by Public Health South (under Crown funding agreements, on behalf of the Southern District Health Board). The Ministry of Health requires Public Health South to reduce any potential health risks by means including submissions, on resource consents to ensure the public health significance of effluent discharge and the effect on ground water is adequately considered by consent authorities. This application has the potential to create adverse effects from contamination of ground water on the health of people and communities.

16. This submitter is not a trade competitor of the Applicant for the purposes of s.308 of the Act.

17. This submitter will wish to be heard in support of this submission.

Dated at Dunedin 22nd day of January 2018

Signed



Tom Scott

**For and on behalf of** Public Health South, Southern District Health Board

**Address for service**

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