

Project KEA

# Domestic Wastewater Discharge to Land - Assessment of Effects



Job No: 64308

Version: Rev D

Date of Issue: 21/11/2022

Author: Paul Duder

## DOCUMENT APPROVAL AND REVISION HISTORY

<b>Document title</b>	Project KEA
	Domestic Wastewater Discharge to Land - Assessment of Effects
<b>Prepared for</b>	South Island Resource Recovery Ltd
<b>Version</b>	Rev D
<b>Date</b>	21 November 2022
<b>Filename</b>	Domestic Wastewater Assessment Of Effects - Relodgement.Docx

<b>Author(s)</b>		
	Paul Duder	Lucy Cramp
	Principal – Project Director	Environmental Scientist
<b>Reviewer(s)</b>		
	Sukhi Singh	
	Technical Director - Planning	

Rev. No	Date	Version	Author(s)	Reviewer
A	8/07/2022	1	PD	SS
B	17/08/2022	1	PD	SS
C	01/11/2022	1	PD	SS
D	18/11/2022	1	PD & LC	

**Reference:** Babbage 2022. Project KEA Domestic Wastewater Discharge to Land - Assessment of Effects. A report prepared for South Island Resource Recovery Ltd by Babbage Consultants Limited. November 2022.

**Cover photo:** Project KEA's official logo, retrieved from <https://www.projectkea.co.nz/>

## 1 EXECUTIVE SUMMARY

Babbage Consultants Limited (“**Babbage**”) has been engaged by South Island Resource Recovery Limited (“**SIRRL**”) to prepare a resource consenting application for the establishment of an Energy from Waste (“**EfW**”) facility, known as Project KEA.

The EfW facility will nominally operate 24hrs per day, 365 days per year converting Municipal Solid Waste (“**MSW**”) and Construction Waste (“**CW**”) that would otherwise be sent to landfill, into electrical energy through the process of combustion.

The facility will have up to 90 people on site daily and therefore will require a domestic wastewater treatment system (“**DWTS**”) to treat and dispose of the wastewater coming from amenities buildings.

The installation and operation of the DWTS is a Restricted Discretionary Activity and requires resource consent under Rule 5.9 of the Canterbury Land and Water Regional Plan (“**CLWRP**”).

This report supports the consent application for the installation and operation of a DWTS comprising primary treatment, secondary treatment and discharge through an on-site shallow drip irrigation field.

## 2 INTRODUCTION – BACKGROUND INFORMATION

The EfW facility is a green field industrial development. As part of its operation, it will have up to 74 staff on site daily to operate the facility 24/7. The site may also periodically host visitors and a daily allowance of 16 has been included for the purposes of sizing the DWTS.

This report covers only the treatment and disposal of domestic waste water through a dedicated DWTS plant and drip field.

### 2.1 Site Description

The property is currently a vacant piece of farmland with a total area of around 14.85ha (Lot 2 of RS22268 RT CB27B/314 as shown in **Appendix A**). The current owners of the land are Murphy Farms Limited.

### 2.2 Certificate of Title Consent Notice

There are no known consent notices for the Lot that impact on the wastewater design.

### 2.3 Site conditions

The site is located in the corner of Morven Glenavy Road and is not serviced by a reticulated wastewater network.

The land is generally flat and has been assessed as being in a low flood risk area. Refer separate report *Project KEA – Flood Plain Assessment: Babbage 2022*.

There is a creek (Whitneys Creek) running along the northern boundary of the site. The creek is not located within the application site.

**Appendix B** shows the topography of the site.

### 2.4 Relationship to Factory Waste water

For the purposes of providing a wider understanding, the domestic wastewater is the only liquid waste water stream requiring disposal to land. The EfW facility main process does not create any 'factory wastewater' that needs to be disposed of to land.

Wastewater generated within the factory process is treated via a dedicated treatment process separate to the DWTS. The contaminates removed are fed back into the main furnace which results in such contaminants eventually ending up in the ash by-product streams. The cleaned water is recycled for re-use within the main EfW facility.

The daily consumed factory water is discharged as water vapour (i.e., evaporation) as opposed to discharge as a liquid stream. [*Refer Technical Report 1 – Section 14 for further details*].





## 2.5 Relationship to Site Drinking Water Supply

A separate water take and use consent will be applied for in due course. This will involve two bores placed on site and some of the water extracted will be used for domestic purposes, following necessary treatment to meet the required drinking water standards.

The bores will be placed towards the southern end of the site, which is the opposite end of site from the proposed drip field for the disposal of the treated domestic wastewater. This results in the bores being approximately 400 m from the drip field area.

Refer Appendix C showing location of drip field relative to proposed bores.

### 3 ASSESSMENT OF ALTERNATIVES

Identified alternative solutions for treating and disposing of domestic wastewater from site are:

1. Piped connection to an existing municipal wastewater system

Due to the distance from the KEA site to the nearest potential municipal system being in the order of 20km (Waimate) and considering the significant infrastructural challenges involved in piping the wastewater this distance, it is considered that this is not a viable option.

2. Storage tanks and daily removal from site by tanker

Treated wastewater could be stored on site in a 30,000lt underground tank and then transferred by truck to a municipal treatment facility when the tank approaches full (approximately every 5 days).

However, given the transport component, and the fact that the Waimate treatment plant also disposes to land, it is considered that this option does not provide any environmental benefit over local treatment and disposal on site.

## 4 RECEIVING ENVIRONMENT

### 4.1 Current management

The Site was originally part of a much larger farm (257.2 ha) owned by Murphy Farms Limited. The property is used as a dairy support farm, providing grazing for dairy replacements, bulls and winter grazing for dairy cows.

The property, which is completely flat, is fully irrigated by a mix of Border Dykes, Guns and K-Lines.

The entire farm was receiving fertiliser at a rate of 440 kg N/ha/year and 37 kg P/ha/year on permanent pasture, and 333 kg N/year and 72 kg P/ha/year on new grass.

The N loss from the root zone and P loss to second order streams for the year-end 2020-21 period<sup>1</sup> are outlined in Table 1.

**Table 1. Nutrient leaching results for Murphy Farms Ltd, adapted from Ravensdown 2021.**

Parameter	Nutrient leaching 2020-21
Area (ha)	257.2
Nitrogen leaching loss to water (total kg N)	14,234
Nitrogen leaching loss to water (kg N/ha)	55
Phosphorus leaching loss to water (total kg P)	243
Phosphorus leaching loss to water (kg P/ha)	0.9

### 4.2 Soils

S-Map<sup>2</sup> classes soils at the Site area predominantly as Darnley soils. Darnley soils are Typic Argillic Pallic Soils, and are low in iron and clay, causing the subsoil to have a weak structure and therefore high density. These soils become very gravelly at depths ranging from approximately 45 cm to 100 cm. Refer separate report *Project KEA Land Use Capability (LUC) Assessment: Babbage 2022*.

The two dominant soil siblings present at the Site (Darnley\_7a.2 and Darnley\_1a.2 are the) cover approximately 77% of the area. These soil types are both considered moderately well drained soils, although the permeability of the slowest horizon is slow (<4 mm/hour).

A site investigation was carried out on 2 November 2022 to determine the soil characteristics.

<sup>1</sup> Ravensdown 2021. Nutrient Budget Report, 2020-2021 Year End. Report prepared for Murphy Farms Ltd, October 2021.

<sup>2</sup> <https://smap.landcareresearch.co.nz/>

The soil profile at the location of the drip field was described to 60 cm and consisted predominantly of silt loam with a moderate to strong structure in the topsoil and a weakly structured to structureless subsoil (>30 cm). Below 20 cm the soil was hard to penetrate with the auger, typical for pallic soils, and showed mottling, which is an indication of imperfect drainage.

The soils are generally Loamy to a depth of 500mm where it transitions to sandy gravels (refer **Appendix D** – Soil type assessment). The drip field will be constructed with materials and soils of similar characteristics.

#### 4.2.1 Hydraulic conductivity

Saturated infiltration rates ( $k_{sat}$ ) were also determined during the site investigation, using a double ring infiltrometer. Two locations were sampled (HA2 and HA5 in Figure 1), and the results are given in Table 2. It can conservatively be assumed that infiltration rates for the discharge area are similar to those at HA2 (average of 96 mm/hour).

**Table 2. Field measurement hydraulic conductivity results**

Hand Auger Location	Saturation (mm/hour)
2	84-96
5	96-108
<b>Average</b>	<b>96</b>

Crites and Tchobanoglous (1998)<sup>3</sup> recommend a design irrigation rate (DIR) of 10 to 30 % of the  $K_{sat}$ . Determination of the DIR is presented in Table 3.

**Table 3. Design irrigation rate**

Measurement	Saturated ( $k_{sat}$ )
Field measurement (mm/hour)	96
Adjustment (%)	10
DIR (mm/hour)	9.6
Design daily rate (DDR) (mm/day)	230

The maximum daily rate could be up to 230 mm/day, at a rate of 9 mm/hour. This is considerably higher than the Design Loading Rate (“DLR”) recommended in AS/NZS 1547:2012 (On-site domestic wastewater management). The drip field soils can be classified as Soil Category 3 with a DLR of 3.5mm/day in accordance with AS/NZS 1547:2012 Table M1 “*Recommended Design Irrigation Rate for Irrigation Systems*” contained in **Appendix E**.

<sup>3</sup> Crites and Tchobanoglous 1998. Small and Decentralized Wastewater Management Systems. WCB/McGraw-Hill. Boston.

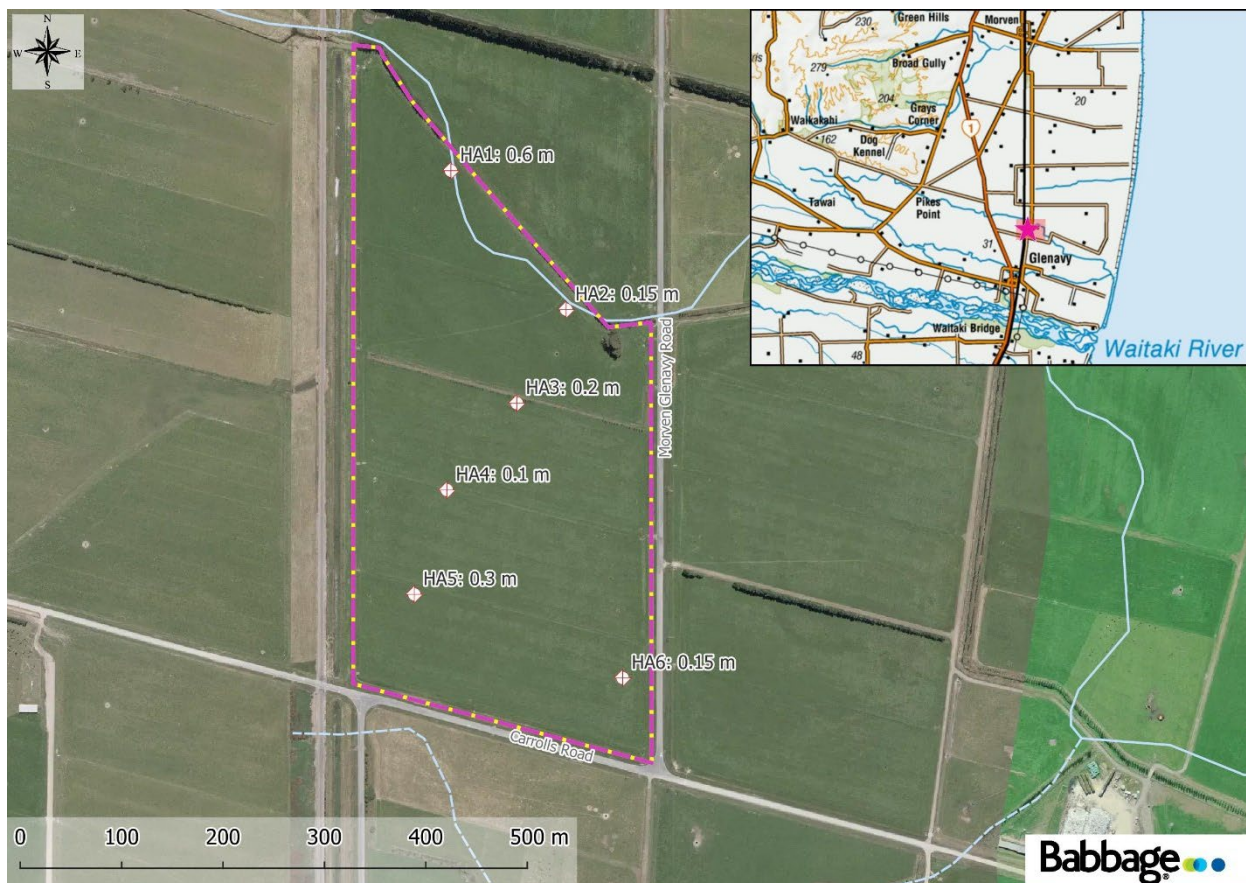


Figure 1. Soil investigation locations and depths to limiting factors.

### 4.3 Groundwater

Groundwater levels have been measured and found to vary through the year from 2 mbgl to 8 mbgl. Refer separate report *Project KEA – Groundwater Level Assessment: Babbage 2022*.

According to the ECan Well Search database, there are three active abstraction wells within a 1 km radius of the Site. These are used for dairy use and stock supply, and all screen below 20 mbgl. There are no bores used for domestic use within a 1 km radius of the Site.

ECAN has groundwater quality from two bores in the vicinity of the Site, J41/0036<sup>4</sup> upgradient, and J41/0035<sup>5</sup> downgradient. There are no available bore logs for these bores in the ECAN database, and depths are not recorded. The summary of the available data is provided in Table 4.

<sup>4</sup> <https://www.ecan.govt.nz/data/well-search/welldetails/?WellNo=J41/0035>

<sup>5</sup> <https://www.ecan.govt.nz/data/well-search/welldetails/?WellNo=J41/0036>

**Table 4. Summary of groundwater quality for nearest bores.**

Measurement		J41/0036 (upgradient)		J41/0035 (downgradient)	
		14/02/1996	06/05/1996	23/02/1996	23/05/1996
Alkalinity, Total	g/m <sup>3</sup> as CaCO <sub>3</sub>	106	113	179	69
Ammoniacal Nitrogen	mg/L	0.042	0.027	<0.005	0.005
Calcium	mg/L	33	31	19	20
Chloride	mg/L	11	16	10	3
Conductivity	mS/m	30.1	29.7	20.8	21.5
Difference in Ion Balance	%	7.7	2.1	28.5	9.8
Faecal Coliforms	cfu/100mL	>400	80	<1	<1
Free Carbon Dioxide	g/m <sup>3</sup> at 25°C	28	47	47	28
Hardness, Total	g/m <sup>3</sup> as CaCO <sub>3</sub>	43	100	66	68
Iron, Total	mg/L	0.4	0.05	<0.120	<0.050
Magnesium, Dissolved	mg/L	5.7	6.1	4.4	4.4
Manganese, Total	mg/L	0.16	0.13	<0.04000	<0.01000
Nitrate Nitrogen	mg/L	0.97	2.6	3.1	3.2
Nitrite Nitrogen	mg/L	0.028	0.027	<0.006	<0.004
pH		6.8	6.6	6.8	6.6
Potassium, Dissolved	mg/L	2.3	2.6	1.4	1.5
Sodium, Dissolved	mg/L	18	19	17	17
Sulphate	mg/L	20	16	15	15
Sum of anions	meq/L	2.53	2.82	3.75	1.76
Sum of cations	meq/L	2.96	2.94	2.09	2.14
Total Coliforms	cfu/100mL	>400	150	20	17
Total Phosphorus	g/m <sup>3</sup>	0.075	0.079	<0.008	<0.008
Total Dissolved Solids	mg/L	180	-	140	-
Total BOD	g O <sub>2</sub> /m <sup>3</sup>	3	-	<2.000	-

**Note:** <[value]: below detection limit.

#### 4.4 Surface Water

The Site is bordered by an irrigation race on the west boundary, running north to south along the rail line, and by Whitneys Creek, which abuts the northern boundary of the site flowing west to east. Refer separate report *Project KEA – Groundwater Level Assessment: Babbage 2022*.

Environment Canterbury (ECAN) monitors the water quality in Whitneys Creek at two locations of interest, upstream of the Site at State Highway 1 (Site ID SQ21288), and at downstream of the Site at Carrols Road (Site ID SQ21289). A summary of the available water quality data is shown in Table 5.

**Table 5. Summary of water quality for Whitneys Creek.**

Measurement		Upstream at SH 1 <sup>6</sup>			Downstream at Carrols Road <sup>7</sup>		
		Max	Average	Min	Max	Average	Min
Ammoniacal Nitrogen	mg/L	0.17	0.0	0.009	0.74	0.1	0.01
Dissolved Oxygen	mg/L	18.6	12.7	5.33	16.74	9.0	2.1
Dissolved Oxygen Saturation	%	170	116.3	63.1	152	80.2	14.1
Dissolved Reactive Phosphorus	mg/L	1.2	0.1	0.004	1.5	0.2	0.001
E. coli	MPN/100mL	-	-	-	2,420	500.7	2
Faecal Coliforms	Cfu/100mL	17,000	1,608.2	8	-	-	-
Nitrate-N Nitrite-N	g/m <sup>3</sup>	2.1	0.4	0.01	4.5	1.5	0.003
pH		9.1	8.3	7.1	9	7.6	6.6
Total Nitrogen	g/m <sup>3</sup>	3	1.1	0.37	5.2	2.2	0.43
Total Phosphorus	g/m <sup>3</sup>	1.4	0.2	0.015	1.9	0.2	0.018
Total Suspended Solids	mg/L	205	18.3	0.8	220	8.8	0.4
Turbidity	NTU	120	7.3	0.7	150	4.6	0.2
Water Temperature (Field)	C	21.3	12.7	5.6	19.1	11.5	1.6

**Note:** Data from ECAN website accessed on 16/11/2022, as per footnote 1 and 2.

<sup>6</sup> <https://www.ecan.govt.nz/data/water-quality-data/wqdetails/?SiteID=SQ21288>

<sup>7</sup> <https://www.ecan.govt.nz/data/water-quality-data/wqdetails/?SiteID=SQ21289>

## 5 ON-SITE EFFLUENT DISPOSAL DESIGN

As there are no council wastewater lines in the area, a new onsite wastewater disposal system and effluent field is required to service the facility.

It is proposed to install an Aerated Wastewater Treatment System providing biological and UV treatment of the wastewater prior to disposal to land via a dedicated drip field.

The location of the proposed wastewater treatment plant and drip field is shown in **Appendix C**. The drip field will be no closer than 20 m to Whitneys creek in compliance with Rule 5.8.3(e).

The drip field will be built up in height so that it is no less than 150 mm above the 500 year flood plain level.

### 5.1 Proposed Treatment System

The treatment system will comprise:

- **Primary Treatment**, including anaerobic digestion and aerobic treatment
- **Secondary Treatment**, including filtration and UV treatment
- **Irrigation field**, including disposal through shallow subsurface drip irrigation field

### 5.2 Design Parameters

The system will be designed in accordance with the provisions of AS/NZS 1547:2012. The details are summarised in Table 6.

**Table 6. Drip field design parameters**

Effluent Volume	
Water consumption per person per day	50 litres/day per person (AS/NZS 1547:2012 Table H4: <b>Appendix F</b> )
Total people per day	74 staff + 16 visitors = 90
Apply capacity safety factor	25%
Peak total wastewater volume	<b>5,625 litres/day (5.6 m<sup>3</sup>/day)</b>
Drip Field Area	
Design Loading Rate	3.5 mm/day
Area of drip field required	5,625 litres / 3.5 = 1,607 m <sup>2</sup>
Apply area safety factor	25%
Total drip field	<b>2,000 m<sup>2</sup></b>

### 5.3 Wastewater Characteristics

Typical nutrient values in raw household wastewater (based on AS/NZS 1547:2012, Table S1) are summarised in Table 7.



**Table 7. Typical nutrient contributions for residential dwellings, adapted from AS/NZS 1547:2012.**

Parameter	Concentration (g/person/day)	Untreated domestic effluent concentration * (g/m <sup>3</sup> )	Treated domestic effluent concentration * (g/m <sup>3</sup> )	Estimated treated effluent concentration for the Site # (g/m <sup>3</sup> )
Total nitrogen (TN)	6-17	30-85	15-75	1,050
Ammonia (NH <sub>3</sub> )	1-3	4-13	Negligible	Negligible
Nitrates and nitrites (NO <sub>2</sub> -N, NO <sub>3</sub> -N)	<1	<1	15-45	630
Total phosphorus (TP)	1-2	4-15	4-10	140

**Notes:** \* assumes a household of 5 people; # calculated for the equivalent of 90 people.

Conservatively assuming a maximum of 90 people per day, as well as the highest effluent concentrations; the expected treated wastewater concentrations would be 1,050 g TN/m<sup>3</sup> and 140 g TP/m<sup>3</sup>.

In addition, the treatment system will discharge treated wastewater in accordance with shallow subsurface drip irrigation effluent requirements as per AS/NZS 1547:2012 Appendix M. These limits are outlined in Table 8.

**Table 8. Effluent quality requirements, adapted from AS/NZS 1547:2012.**

Parameter	90% samples (g/m <sup>3</sup> )	Maximum (g/m <sup>3</sup> )
BOD <sub>5</sub>	<20	30
TSS	<30	45

## 5.4 Nutrient Loading Rates

The yearly wastewater nutrient loads following treatment are summarised in Table 9. These are based on a peak daily volume of 5.6 m<sup>3</sup> (Table 6). It should be noted that the modelled nutrient loads are taken into account with the remainder of the Site (i.e., total area of 14.85 ha), given that the land is being retired from its current management practices i.e., fertiliser applications, dairying, and irrigation.

Assuming 80% occupancy i.e., 72 people; the expected nutrient loads would be 26 kg TN/ha/year and 4 kg TP/ha/year.

**Table 9. Estimated effluent wastewater nutrient loads for the Site**

Parameter	Daily load (kg/day)	Yearly load (kg/year)	Load per ha (kg/ha/year) #
Total nitrogen (TN)	1.1	394	26
Ammonia (NH <sub>3</sub> )	Negligible	Negligible	Negligible
Nitrates and nitrites (NO <sub>2</sub> -N, NO <sub>3</sub> -N)	0.6	237	16
Total phosphorus (TP)	0.1	53	4
BOD5 *	0.2	61	4
TSS *	0.3	92	6

**Notes:** Assumes 80% occupancy i.e., 72 people; \* assumes maximum concentration values; # calculated over the entire Site i.e., 14.85 ha.

### 5.5 Drip Field Construction

The irrigation field will be capped by no less than 200 mm of good quality topsoil.

Pressure compensating irrigation lines will be placed at 1m apart and be nominally 100mm below ground level.

The irrigation field will be seeded in grass and maintained by mowing. The irrigation field will not be used or accessed for any other purpose other than mowing, inspection, and maintenance.

### 5.6 Maintenance of Disposal Field

The disposal field is contained within the site. The owner will inspect and maintain the field in accordance with the supplier's recommendations.

## 6 EFFECTS OF PROPOSED ACTIVITY

The disposal of domestic wastewater to land has the potential to affect the following:

- Soil status – if there is excessive loading and/or the discharge chemistry affects soil chemistry
- Groundwater quality – if there are high contaminants loads
- Surface water quality – if overland flows occur

The likely actual effects of the proposed discharge to the irrigation field at the Site are discussed in turn below.

### 6.1 Effects on Soil Quality

#### 6.1.1 Overview

Soil quality can be adversely affected by domestic wastewater in two ways: by waterlogging (over-saturation of soils) if there is excessive application, and if the chemistry of the wastewater is such that it affects the soil itself.

#### 6.1.2 Waterlogging

Over-saturation of soils could occur if the irrigation field is too small (i.e. too much wastewater is applied to too small an area), or if the irrigation rate is too high. Over-saturation could lead to ponding, and potential odour generation, as well as subsequent surface run-off. In addition, over-saturated soils are more susceptible to compaction, which would affect the soil's drainage capacity, effectively exacerbating the problem.

The proposed hydraulic loading rate of 3.5 mm/day is significantly less than the topsoil assimilative (absorption) capacity and below the calculated design irrigation rate of 230 mm/day, based on field measurements (refer Section 4.2.1). The low application rate will allow the topsoil to assimilate the irrigation demand via plant (grass) uptake and transpiration without exceeding saturation.

Ponding is not expected to be a concern given the low application rate in comparison to the soils saturated hydraulic conductivity capacity and that the irrigation lines will be buried 200 mm below the surface to prevent overland flow during periods of high rainfall (i.e., when rain falls at rates faster than the receiving soils can drain).

### 6.1.3 Nutrients

If not sustainably managed, wastewater irrigation has the potential to initiate soil health degradation due to relatively high loads of nutrients. Potential adverse effects of high nitrogen loading on soil and plants can include an oversupply of nitrogen in excess of plant requirements, leading to leaching to groundwater drainage, as well as plant damage due to high concentrations of ammonia.

Under the proposed regime, the Site would receive a total irrigated nutrient load of 394 kg N/year (26 kg N/ha/year) and 53 kg P/year (4 kg P/ha/year). It should be noted that the modelled nutrient loads are taken into account with the remainder of the Site (i.e., total area of 14.85 ha), given that it is being retired from dairying. For comparison, when under Murphy Farms Ltd, the Site was receiving fertiliser at a rate of 440 kg N/ha/year and 37 kg P/ha/year on permanent pasture, and 333 kg N/year and 72 kg P/ha/year on new grass.

Fertiliser applications, stock effluent, and irrigation all contribute to the nutrient loads to soil. These practices will be retired on the Site however, meaning that the proposed irrigation will contribute to an overall reduction in nutrient loads.

### 6.1.4 Other Contaminants

A healthy soil environment can assimilate up to 600 kg BOD<sub>5</sub>/ha/day (NZLTC 2000)<sup>8</sup>. The proposed irrigated area (0.2 ha) is, therefore, capable of assimilating up to 120 kg BOD<sub>5</sub>/day. With a maximum concentration of 30 g BOD<sub>5</sub>/m<sup>3</sup>, the treated effluent is expected to result in 0.2 kg BOD<sub>5</sub>/day, which is significantly less than the potential for soil assimilation.

BOD, TSS and any microbes that enter the soil will be treated within the soil profile through the mechanisms of filtration, adsorption and natural attrition. Auckland Regional Council (2003)<sup>9</sup> identify the following soil attenuation rates:

- A BOD<sub>5</sub> attenuation rate of 80%
- TSS removal of 90%
- Bacteria removal of 90% was considered appropriate for the attenuation of faecal coliform in the land application system

---

<sup>8</sup> NZLTC. 2000. New Zealand Guidelines for Utilisation of Sewage Effluent on Land. Part 2: Issues for Design and Management. (Edited by LJ Whitehouse, H Wang and M Tomer). Joint publication of the New Zealand Land Treatment Collective and Forest Research. Rotorua, New Zealand.

<sup>9</sup> Auckland Regional Council 2003. Infiltration design, construction and maintenance. In TP010 Stormwater management devices: Design guidelines manual. Auckland, Auckland Council. pp.1-4.

Several studies also show that the passage of treated wastewater through the soil at a low rate and intermittently will enhance the natural pathogen die-off and reduce the number eventually transported into ground/surface water. The main mechanisms that operate within the soil matrix to ensure pathogen removal are filtration, adsorption and natural attrition. Results from various studies<sup>10,11</sup> show virus reductions of 99.99 % through 0.6 m of 0.12 mm diameter sand and bacteria reductions of 99.998 % through 0.9 m of 0.15 mm diameter dune sand, with 92 to 97 % reduction occurring in the top 1 cm. Therefore, the soils have the required capacity to treat and assimilate the loads of pathogens, BOD<sub>5</sub>, and TSS resulting from the proposed activity, and the effects from the discharge on the soil will be very low.

### 6.1.5 Conclusion

Overall, it is considered that with an appropriate drainage system in place, the proposed activity will have no discernible adverse effect on soil quality.

## 6.2 Effects on Groundwater Quality

### 6.2.1 Overview

Potential effects of effluent wastewater irrigation to groundwater vary with factors such as soils and depth to groundwater. Some potential contaminants (such as nitrogen) are very mobile in soils and can end up accumulating in groundwater above recommended levels for human consumption. Furthermore, such contaminants can also migrate through groundwater and contaminate surface water bodies that receive contributions from groundwater flow. However, the proposed activity includes a set of measures to protect the receiving environment, and as such the effects on groundwater are expected to be less than minor as further discussed below.

### 6.2.2 Nutrients

Due to its mobility through soil, nitrate is the primary nutrient of concern in groundwater. Nutrient loads can leach into the groundwater and contribute to surface water environments further down the catchment. If present in high concentrations in drinking water, nitrate has the potential to adversely affect human health. The DWSNZ specifies an MAV of 11.3 g nitrate nitrogen/m<sup>3</sup>.

There are three consented groundwater abstractions within a 1 km radius of the Site, further to the proposed bores at the Site, that could be affected by the proposed activities. However, the consented bores

---

<sup>10</sup> Crane SR and Moore JA 1984. Bacterial Pollution of Groundwater: A Review. Water Air and Soil Pollution 22: 67-83.

<sup>11</sup> Gunn I 1997. On-site wastewater systems and bacterial reduction in sub-soil disposal areas: A review. On Site NewZ Special Report 97/2.

are deep (over 20 m deep), and groundwater abstraction at these bores is for agricultural purposes and not domestic use.

Under current management practices, the entire farm leaches around 55 kg N/ha/year and 0.9 kg P/ha/year. Fertiliser applications, stock effluent, and irrigation all contribute to the leaching losses to groundwater. These practices will be retired on the Site however, meaning that the proposed irrigation will contribute to an overall reduction in nutrient leaching to the wider catchment.

### 6.2.3 Other Contaminants

The use of UV treatment should ensure that *E. coli* levels in the discharge remain low. There are no community water supply wells within 1 km of the factory, and no abstraction bores within 50 m of the proposed drip field. Therefore, the risks associated with *E. coli* from the discharge migrating and persisting in groundwater are considered very low.

Furthermore, as described in Section 6.2.3, BOD, TSS, and any microbes that enter the soil, will be treated within the soil profile through the mechanisms of filtration, adsorption and natural attrition.

### 6.2.4 Mitigation Measures

Effects on groundwater will be significantly mitigated by adopting an appropriate irrigation regime that avoids field capacity being exceeded following irrigation and the adoption of an application rate (3.5 mm/day) that avoids preferential or bypass flow through large soil pores and cracks.

In extremely wet years, drainage to groundwater, and as such nutrient losses, could increase. As long as the DIR does not exceed soil hydraulic conductivity however, the effects under such conditions are not expected to be significant.

### 6.2.5 Conclusion

The proposed activity will have no discernible adverse effect on receiving groundwater quality. The potential discharge will be in accordance with Schedule 5 of the Canterbury Land and Water Regional Plan, in particular to relevant receiving water standards Table S5A and S5C. In addition, the potential discharge is unlikely to result in non-compliance of the receiving freshwater environments with the relevant values of Schedule 8 – Region Wide Water Quality Limits.

## 6.3 Effects on Surface Water Quality

### 6.3.1 Overview

No ponding is expected to occur, so there will be no direct discharges to surface water. As discussed in Section 6.2, no discernible adverse effects on groundwater are predicted, so the quality of base-flows to far-field surface water bodies will not be affected.

### 6.3.2 Runoff

Notwithstanding the above, in the event of potential surface runoff resulting from either poor management of the application area, infrastructure failure, or excessive rainfall, runoff would need to travel over a minimum distance of 20 m prior to reaching Whitney's Creek.

Should this occur, the overland flow path would incorporate some soil infiltration and provide vegetative treatment. Phosphorus has an overland preferential pathway, however numerous studies have shown that grass buffers are effective at intercepting sediments and sediment bound pollutants, including phosphorus. A study in the Bay of Plenty for example, reported grass filters of three metres can reduce phosphorus loads by 87 % (and nitrogen loads by 35 %) (McKergow, Costley and Timpany 2009)<sup>12</sup>. Similarly, a technical report prepared for WRC states that "*Where grassy riparian filters intercept low to moderate sheet-flow, sediment removal efficiency may reach 70-90%*" (Ritchie 2011)<sup>13</sup>. Nitrogen does not readily runoff during high rainfall events, and has a preferential pathway through the soil instead.

Overall, it is considered that in the worst-case scenario, resulting in potential run-off from the drip field, the treatment outcome will still be of high quality and will not adversely affect the water quality in Whitney's Creek.

### 6.3.3 Conclusion

The proposed activity will have no discernible adverse effect on surface water quality. The potential discharge will be in accordance with Schedule 5 of the Canterbury Land and Water Regional Plan, in particular to relevant receiving water standards Table S5A and S5C. In addition, the potential discharge is unlikely to result in non-compliance of the receiving freshwater environments with the relevant values of Schedule 8 – Region Wide Water Quality Limits.

## 6.4 Cumulative Effects

Current fertiliser applications, stock effluent, and irrigation all contribute to the nutrient loads, and as such, leaching losses to groundwater. These practices will be retired on the Site however, meaning that the proposed activity will contribute to an overall reduction in nutrient loads to the wider catchment.

As such, the cumulative effects of the proposed activity are expected to be less than minor.

---

<sup>12</sup> McKergow L, Costley K, and Timpany G 2009. Contour grass filter strips: hydrology and water quality. National Institute of Water and Atmospheric Research.

<sup>13</sup> Ritchie 2011. Diffuse sediment in Waikato waterways – sources, practices for reduction, and policy options. Report written for Waikato Regional Council, December 2011.

## 7 STATUTORY ASSESSMENT

### 7.1 Assessment of CLWRP Objectives

OBJECTIVE	COMMENT
3.1 – Land and water are managed as integrated natural resources to recognise and enable Ngāi Tahu culture, traditions, customary uses and relationships with land and water.	This assessment demonstrates that the proposal will have an adverse effect on the receiving environment that is less than minor. Therefore, it is considered that the cultural values of Ngāi Tahu and their relationship with land and water is maintained.
3.13 – Groundwater resources remain a sustainable source of high-quality water which is available for abstraction while supporting base flows or levels in surface water bodies, springs and wetlands and avoiding salt-water intrusion.	The proposed discharge system will not have an adverse effect on water supplies nearby due to the treatment proposed and adequate separation distances from established water takes. There are no abstraction bores within 50 m of the proposed irrigation field.
3.23 – Soils are healthy and productive, and human-induced erosion and contamination are minimised.	The proposed treatment will ensure that any contamination is minimised.

### 7.2 Assessment of CLWRP Policies

POLICY	COMMENT
<p>4.14 – Any discharge of a contaminant into or onto land where it may enter groundwater (excluding those passive discharges to which Policy 4.26 applies):</p> <ol style="list-style-type: none"> <li>a. will not exceed the natural capacity of the soil to treat or remove the contaminant; and</li> <li>b. will not exceed available water storage capacity of the soil; and</li> <li>c. where meeting (a) and (b) is not practicable, the discharge will: <ol style="list-style-type: none"> <li>i. meet any nutrient limits in Schedule 8 or Sections 6 to 15 of this Plan; and</li> <li>ii. utilise the best practicable option to ensure the size of any contaminant plume is as small as is reasonably practicable; and</li> </ol> </li> </ol>	Treatment system performance and drip field loading rates are designed and selected in accordance with AS/NZS 1547:2012.



<ul style="list-style-type: none"> <li>iii. ensure there is sufficient distance between the point of discharge, any other discharge and drinking-water supplies to allow for the natural decay or attenuation of pathogenic micro-organisms in the contaminant plume; and</li> <li>iv. not result in the accumulation of pathogens, or a persistent or toxic contaminant that would render the land unsuitable for agriculture, commercial, domestic, cultural or recreational use or water unsuitable as a source of potable water or for agriculture; and</li> <li>v. not raise groundwater levels so that land drainage is impeded.</li> </ul>	
<p>4.14A – The disposal of domestic effluent and wastewater shall be managed so as to avoid any adverse effect that is more than minimal on surface and ground waters. Where residential density exceeds 1.5 dwellings per hectare and the total population is greater than 1000 persons, community reticulated systems should be promoted. Alternatively, other measures should be promoted to reduce adverse effects on water bodies from effluent disposal systems, including secondary treatment systems and septic tank warrants of fitness.</p>	<p>The proposed treatment and disposal system has been designed to ensure that adverse effects are less than minor on surface and ground waters.</p> <p>The proposed wastewater system will not accommodate more than 1000 person.</p>

### 7.3 Assessment of CLWRP Rules

The discharge of treated domestic wastewater from the proposed system has the potential to enter groundwater and therefore falls under Rule 5.8 of the LWRP. An assessment of the proposed activity against the relevant rules in the CLWRP are:

RULE	COMMENT
<b>Rule 5.8.1</b> – The discharge volume does not exceed 2 m <sup>3</sup> per day	<b>Does not comply.</b> Discharge volume will exceed 2m <sup>3</sup> per day
<b>Rule 5.8.2</b> – The discharge is onto or into a site that is equal to or greater than 4 hectares in area	<b>Complies.</b> Site is circa 15ha
<b>Rule 5.8.2a</b> – The discharge is not located within an area where residential density exceeds 1.5 dwellings per hectare and the total population is greater than 1000 persons	<b>Complies.</b> The site is in a rural area where the residential density is less than 1.5 dwellings per ha.
<p><b>Rule 5.8.3</b> – The discharge is not onto or into land:</p> <p>(a) where there is an available sewerage network; or</p> <p>(b) that is contaminated or potentially contaminated; or</p> <p>(c) that is listed as an archaeological site; or</p> <p>(d) in circumstances where the discharge would enter any surface waterbody; or</p> <p>(e) within 20 m of any surface waterbody or the Coastal Marine Area; or</p> <p>(f) within 50 m of a bore used for water abstraction; or</p> <p>(g) within a Community Drinking-water Protection Zone as set out in Schedule 1; or</p> <p>(h) where there is, at any time, less than 1 m of vertical separation between the discharge point and groundwater</p>	<p><b>Complies.</b> There is no available sewerage network</p> <p><b>Complies.</b> Site is deemed unlikely to be contaminated (refer PSI Report)</p> <p><b>Complies.</b> Site is not listed as archaeological site</p> <p><b>Complies.</b> Discharge will not enter surface waterbody</p> <p><b>Complies.</b> Drip field is greater than 20m from Whitneys Creek</p> <p><b>Complies.</b> Drip field is greater than 50m from any bore</p> <p><b>Complies.</b> Site is not designated a Drinking Water Protection Zone</p> <p><b>Complies.</b> High groundwater has been measured at 2mbgl. Drip field will also be built up to be 150mm above 500yr flood level.</p>
<b>Rule 5.8.4</b> – The treatment and disposal system is designed and installed in accordance with Sections 5 and 6 of New Zealand Standard AS/NZS 1547:2012 – On-site Domestic Wastewater Management	<b>Complies.</b>
<b>Rule 5.8.5</b> – The treatment and disposal system is operated and maintained in accordance with the system's design specification for maintenance or, if there is no design specification for maintenance,	<b>Complies.</b> Owner will operate and maintain the system in accordance with suppliers recommended procedures.

Section 6.3 of New Zealand Standard AS/NZS 1547:2012 – On-site Domestic Wastewater Management	
<b>Rule 5.8.6</b> – The discharge does not result in wastewater being visible on the ground surface	<b>Complies.</b> Drip field area and DLR selected to ensure that ponding will not occur.
<b>Rule 5.8.7</b> – The discharge does not contain any hazardous substance	<b>Complies.</b> Treatment system will only treat domestic wastewater. No hazardous waste is to be disposed of through system.
<b>Rule 5.9</b> – The discharge of wastewater from:  (a) an existing on-site wastewater treatment system onto or into land in circumstances where a contaminant may enter water that does not meet one or more of the conditions of Rule 5.7; or  (b) a new, modified or upgraded on-site wastewater treatment system onto or into land in circumstances where a contaminant may enter water that does not meet one or more of the conditions of Rule 5.8; is a restricted discretionary activity.	Not Applicable  Applicable. <b>Restricted Discretionary Activity</b>
<b>Rule 11.5.1</b> – The discharge of wastewater from a new on-site domestic wastewater treatment system is not within the Cultural Landscape/Values Management Area	<b>Complies.</b> The discharge will not be located within the cultural Landscape / Values Management Area as identified in the CLWRP.

In accordance with Rule 5.9 the discharge of wastewater from the proposed on-site wastewater treatment system is a **RESTRICTED DISCRETIONARY ACTIVITY**.

#### 7.4 ECan CON070 Planning Assessment

Completed application form CON070: *Planning Assessment* is contained in **Appendix G**.

#### 7.5 ECan CON070 Application to Discharge

Completed application form CON070: *To Discharge On-Site Wastewater* is contained in **Appendix H**.

## 8 CONCLUSIONS AND RECOMMENDATIONS

### 8.1 Wastewater Treatment and Disposal System

The applicant requests consent to install a domestic wastewater treatment system comprising both primary and secondary treatment.

The treatment capacity of the system shall be 5,650 litres per day to service up to 90 people.

The treated wastewater will be discharged through a shallow drip irrigation field constructed on-site with an area of 2,000 m<sup>2</sup>.

### 8.2 Environmental Effects

The environmental effects of installing and operating the proposed wastewater treatment system, when done in accordance with the suppliers operational and maintenance instructions is expected to be less than minor.

The potential discharge will be in accordance with Schedule 5 of the Canterbury Land and Water Regional Plan, in particular to relevant receiving water standards Table S5A and S5C. In addition, the potential discharge is unlikely to result in non-compliance of the receiving freshwater environments with the relevant values of Schedule 8 – Region Wide Water Quality Limits.

### 8.3 Recommendation and Proposed Consent Conditions

It is recommended the consent application be granted with the inclusion of the following consent conditions:

1. The contaminants discharged shall originate only from domestic wastewater generated from toilets, showers and kitchen facilities
2. The treatment system shall incorporate both Primary, Secondary and UV treatment
3. The volume of treated wastewater discharged shall not exceed 5,650 litres per day
4. The treated wastewater shall not exceed the following limits:
  - a. BOD5            90% samples < 20g/m<sup>3</sup>: MAX 30g/m<sup>3</sup>
  - b. TSS             90% samples < 30g/m<sup>3</sup>: MAX 45g/m<sup>3</sup>
5. The treated wastewater shall be discharged to an on-site shallow drip irrigation field of no less than 2,000m<sup>2</sup>
6. Drip lines shall be installed nominally 1m apart and at a depth of nominally 100mm
7. The drip field shall be constructed to be no less than 150mm above the 500yr flood event level and shall be capped with no less than 200mm of quality topsoil
8. The drip field shall be greater than 20m from any surface water body and 50m from any bore used for the abstraction of water
9. The drip field shall be grassed and mown and shall not be used for stock grazing purposes.



## **9 LIST OF APPENDICES**

**9.1 Appendix A – Title Plan**

**9.2 Appendix B – Site Photos**

**9.3 Appendix C – Site Layout and Drip Field Location**

**9.4 Appendix D – Soil Type Assessment**

**9.5 Appendix E – AS/NZS 1547:2012 Table M1 – Design Loading Rates**

**9.6 Appendix F – AS/NZS 1547:2012 Table H4 – Design Flow Allowances: Commercial Premises**

**9.7 Appendix G – CON070 Planning Assessment**

**9.8 Appendix H – CON070 Application for Consent to Discharge**



## Appendix A Title Plan





Issue	Date	Reason	Approved
A	10/21	For Consent	DS

Notes:

Owners: Murphy Farms Limited  
 Address: Cnr Carrolls Road & Morven Glenavy Road  
 Appellation: RS 22268  
 RT Reference: RT CB278/314  
 Total Area: 78.4406 ha

- All dimensions in metres unless shown otherwise;
- Existing boundaries adopted from LINZ online database;
- Aerial Photography: Sourced from LINZ Database <https://data.linz.govt.nz/layer/99197-centbury-03m-rural-aerial-photos-2017-2018/> under Creative Commons Attribution 4.0 International;
- This plan is in terms of NZGD2000 Timaru Circuit;
- This plan has been prepared for the sole purpose of obtaining subdivision consent pursuant to Section 88 of the Resource Management Act 1991;
- Use of this plan for other purposes or its reproduction in part or full is not permitted without the prior consent of Davis Ogilvie (Aoraki) Ltd;
- A full assessment of easements will be undertaken prior to final survey and subsequent to proposed servicing and engineering requirements being confirmed;
- All dimensions and areas are subject to final legal survey;
- Services are sourced from Canterbury Maps and are indicative only;

Key:

- Water Supply
- Electricity (Overhead)
- Fence
- Whitney's Creek
- Existing Easement



Location Diagram  
Scale @A1: 1:40,000

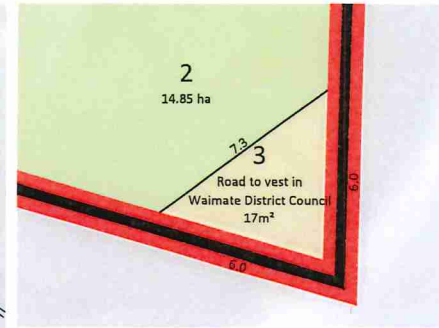
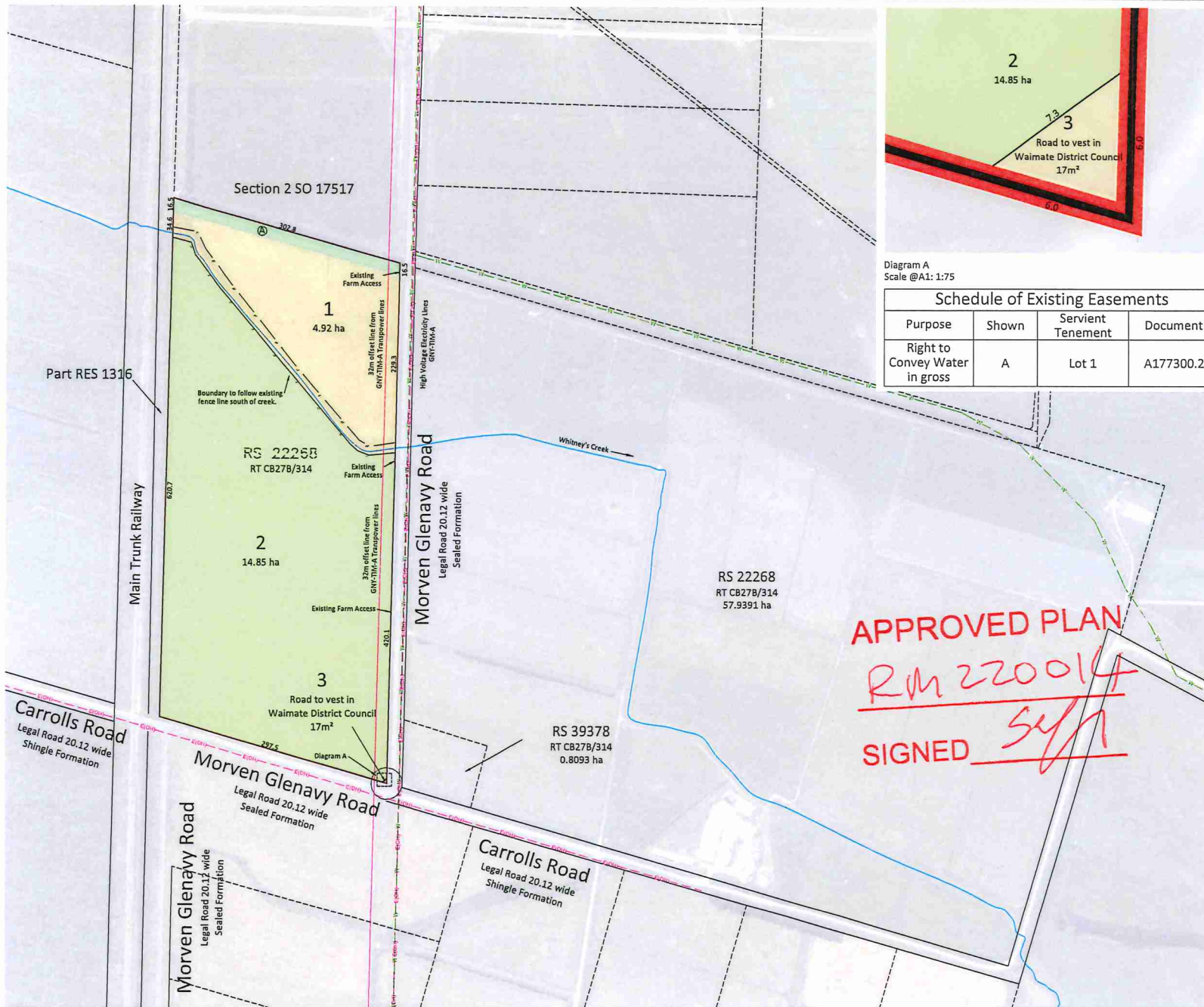


Diagram A  
Scale @A1: 1:75

Schedule of Existing Easements

Purpose	Shown	Servient Tenement	Document
Right to Convey Water in gross	A	Lot 1	A177300.2



**APPROVED PLAN**  
*RM 220014*  
**SIGNED** *SJA*

CAD ref.: C:\12\5\data\DO-TIMARU\30462-TM - Cnr Carrolls Road Morven Glenavy Road, Waimate, New Zealand\_874\08\CADD\Draw\DOA-30462-SubmPlan-PL01A.dwg

**do** DAVIS OGILVIE  
 Davis Ogilvie (Aoraki) & Partners Ltd  
 Engineers - Surveyors - Planners  
 14 The Terrace, Timaru 7940  
 P.O. Box 359 Timaru, NZ  
 Ph. 03 688 8350 / 0800 888 350  
 Also - Nelson, Christchurch, Greymouth

**LOTS 1 - 3 BEING A PROPOSED SUBDIVISION  
 OF RS 22268**

**MURPHY FARMS LTD.**  
 'R CARROLLS ROAD & MORVEN GLENAVY ROAD

Design	Drawn	QA check	dwg	Issue
DS	TH	DS	PL01 A	
Scale @ A1	Date	File		
1:2500	10/21	30462		

## Appendix B Site Photos





Appendix B Site Photo - View NNE across Site








Appendix B Site Photo - View SE along Whitneys Creek on Site Northern Boundary





## **Appendix C     Site Layout and Drip Field Location**



-  Deciduous Planting (eg. Chinese Poplar) to establish early screening that may only be employed in the short to medium term
-  Evergreen Planting (eg. Kahikatea) for longer term, permanent screening & mitigation
-  Wetland Underplanting (eg. flxa, cabbage trees, oioi)



## Appendix D    Soil Type Assessment

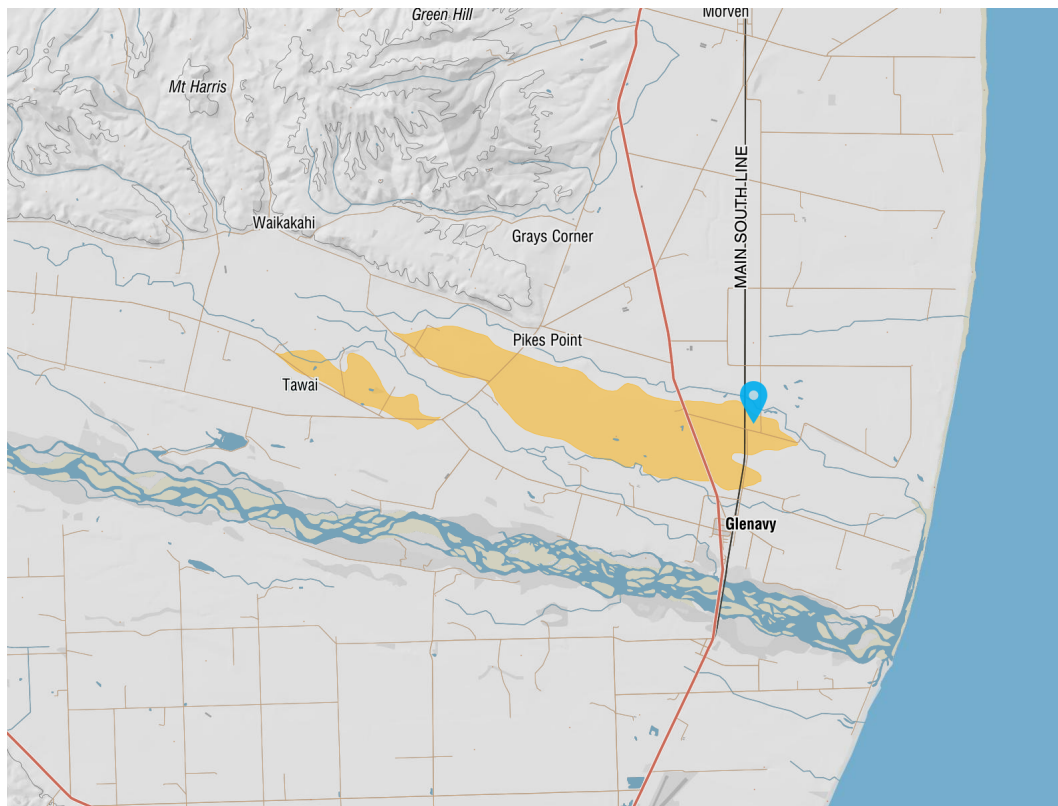




# Soil map unit factsheet

Report generated: 28/06/2022 from <https://smap.landcareresearch.co.nz/maps-and-tools/app/?gislayers=PandD&soilmapuc=scp216&factsheetType=undefined&siblingNumber=undefined&objectId=undefined&pinCoordinate=1450794.1430093008%2C5026900>

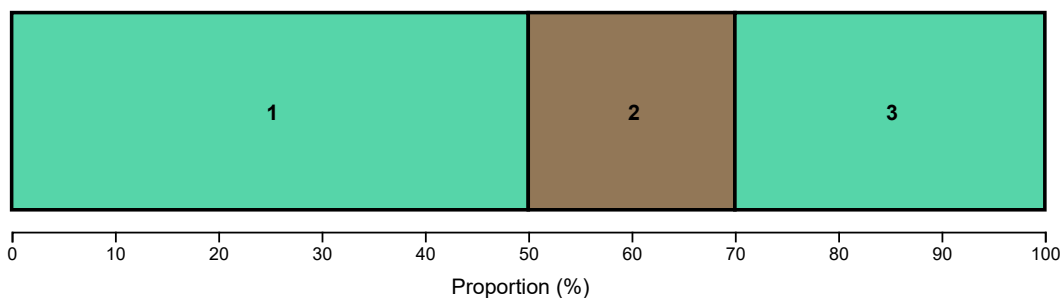
Areas with PandD\scp216 map unit code are shown on the map below. A soil map unit is a collection of areas that have the same soils (i.e. siblings) in the same proportion.



Map contains data sourced from LINZ. Crown Copyright Reserved

## Proportion of siblings in this map unit

Graph is coloured according to the NZSC soil order of each sibling within this map unit.



**Sibling**  
 1: Darnley\_7a.2 (50%)  
 2: Morven\_5a.1 (20%)  
 3: Darnley\_1a.2 (30%)

**Soil Order**  
 Brown  
 Pallic

## Soil properties of the siblings within the soil map unit

This table shows the details of the soil siblings within the map unit. The profile available water (PAW) is a measure of the capacity of the soil sibling to store water to a depth of 1 metre. Click the links below to find out more about each item:

[Soil Order](#), [Drainage Class](#), [Depth Class](#)

No.	Smap name	Proportion (%)	Depth	Texture	Drainage class	PAW (mm)	Order
1	Darnley_7a.2	50	Shallow	silt	Moderately well drained	78.8	Pallic
2	Morven_5a.1	20	Shallow	silt	Well drained	99.5	Brown
3	Darnley_1a.2	30	Shallow	silt	Moderately well drained	103.9	Pallic

## Soil Survey

This soil mapunit was mapped within the following soil survey:

**Survey Title:** South Canterbury

**Survey Scale:** 50000

**Survey Date:** 2003-2014

**Origin:** legacy update major

**Map Unit Delineation Method:** Hand-drawn

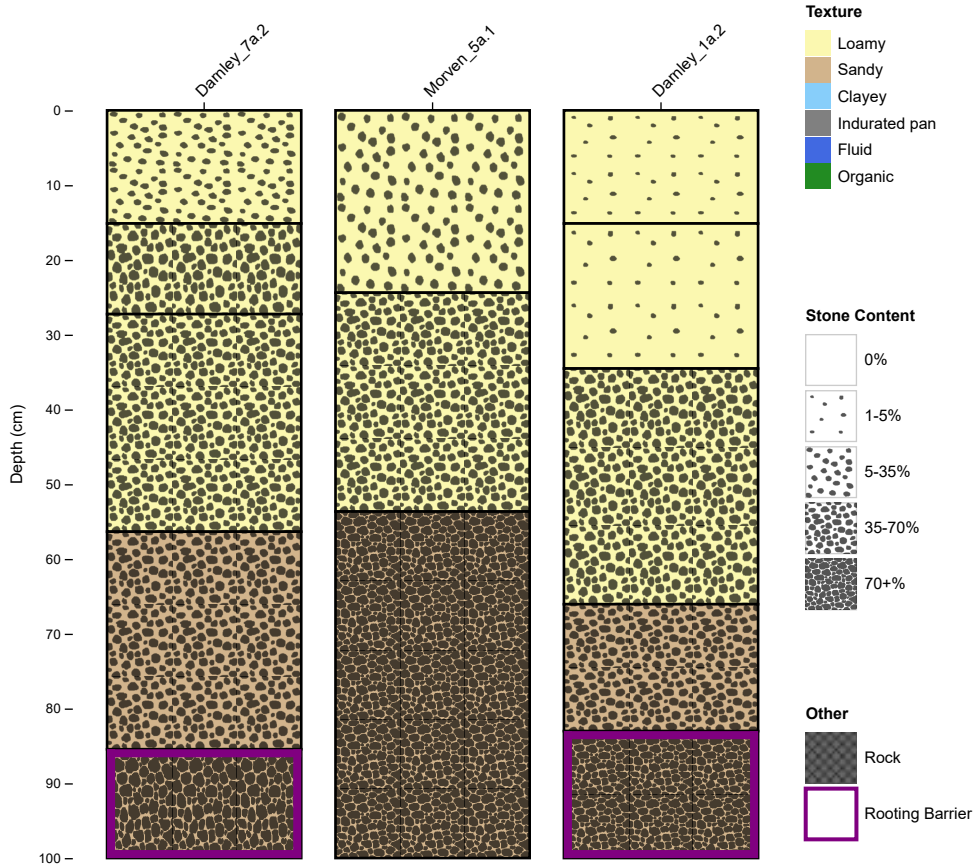
**Map Unit Labelling Method:** Observations

**Sibling Base Property Classification Method:** Observations

**Description:** Average quality for a 1:50,000 soil map. Most of S-map

# Texture graph

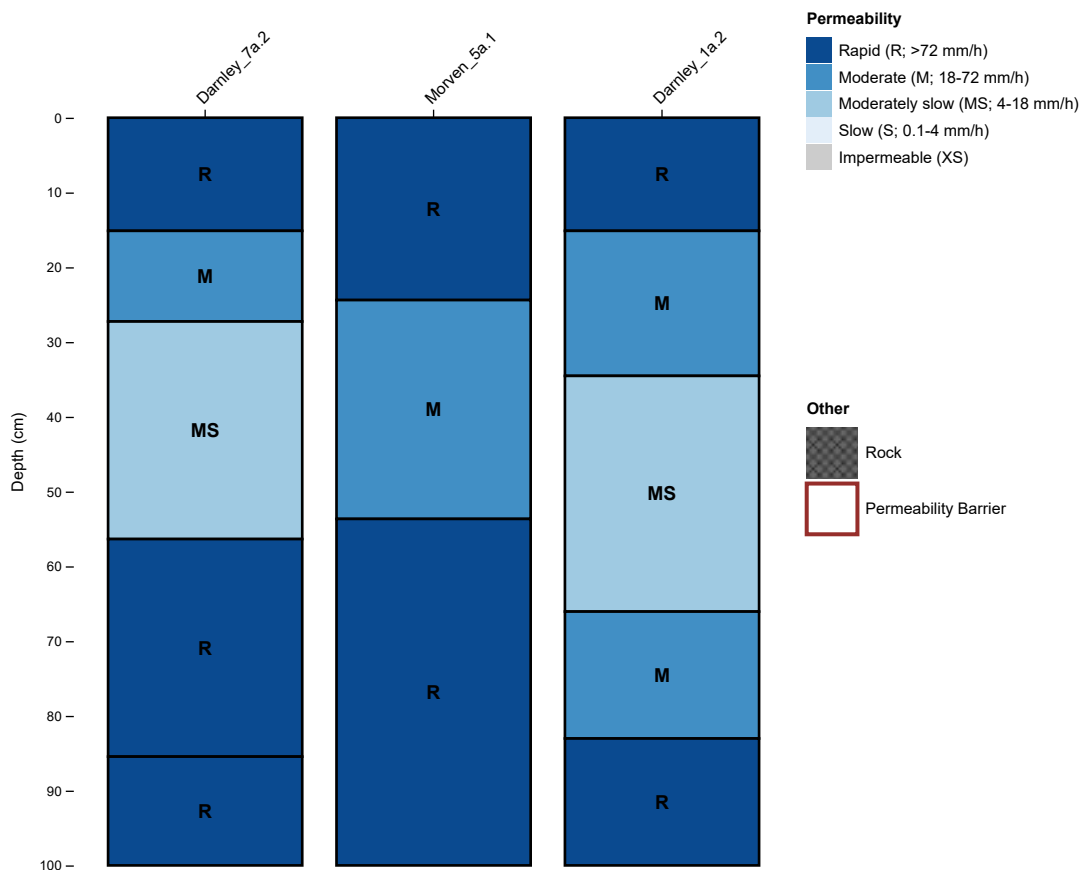
This graph shows the texture profile of the siblings found in the map unit. Each horizon is coloured according to its texture.





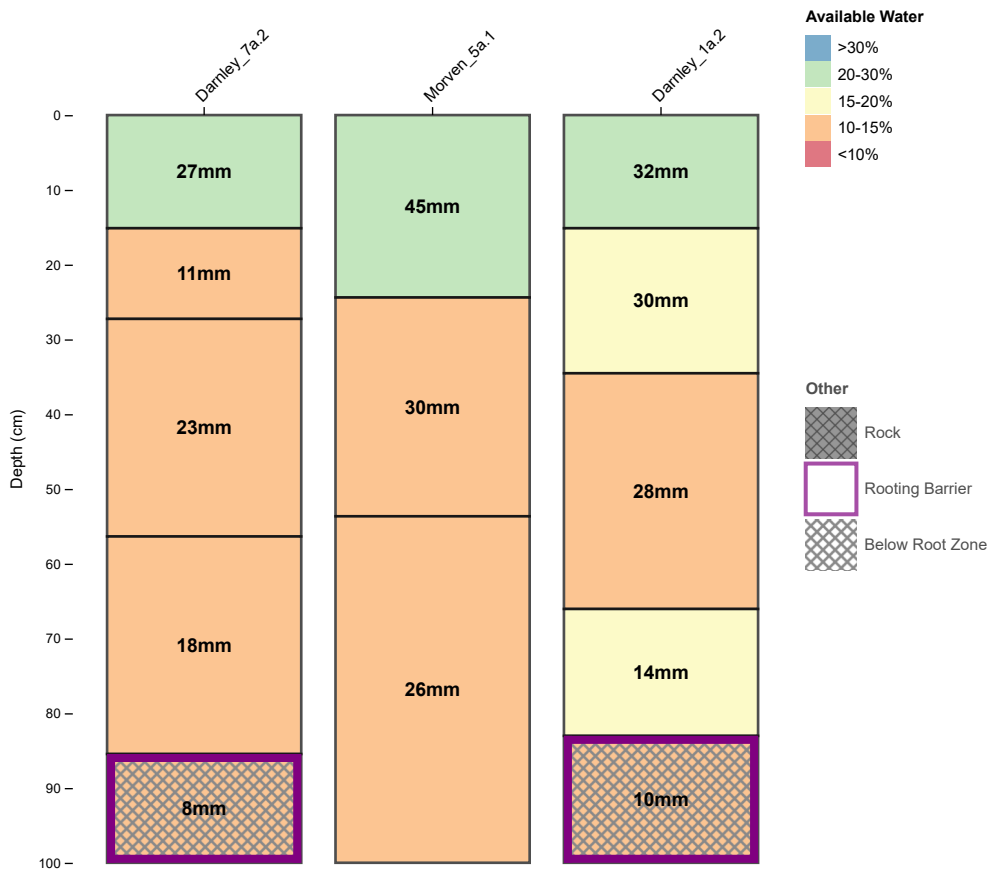
# Permeability graph

This graph shows the permeability profile of the siblings found in the map unit. Each horizon is coloured according to its permeability. Click [here](#) for more information on permeability.



## Available Water Graph

This graph shows the available water profile of the siblings found in the map unit. This is capacity of the soil to hold water that is available to plants. Each horizon is coloured according to its percent available water content. Click [here](#) for more information on available water.



### About this publication

- This information sheet describes the typical average properties of the specified soil map unit.
- For further information on individual soils, contact [Landcare Research New Zealand Ltd](#)
- Advice should be sought from soil and land use experts before making decisions on individual farms and paddocks.
- The information has been derived from numerous sources. It may not be complete, correct or up to date.
- This information sheet is licensed by Landcare Research on an "as is" and "as available" basis and without any warranty of any kind, either express or implied.
- Landcare Research shall not be liable on any legal basis (including without limitation negligence) and expressly excludes all liability for loss or damage howsoever and whenever caused to a user of this factsheet.



**Manaaki Whenua**  
Landcare Research

© Landcare Research New Zealand Limited 2022.  
Licensed under Creative Commons Attribution - NonCommercial - No  
Derivative Works 3.0 New Zealand License (BY-NC-ND)

## **Appendix E AS/NZS 1547:2012 Table M1 – Design Loading Rates**



**TABLE M1**  
**RECOMMENDED DESIGN IRRIGATION RATE (DIR) FOR IRRIGATION SYSTEMS**

Soil Category (see Note 1)	Soil texture	Structure	Indicative permeability ( $K_{sat}$ ) (m/d)	Design irrigation rate (DIR) (mm/day)		
				Drip irrigation	Spray irrigation	LPED irrigation
1	Gravels and sands	Structureless (massive)	> 3.0	5 (see Note 2)	5	(see Note 3)
2	Sandy loams	Weakly structured massive	> 3.0 1.4 – 3.0			4
3	Loams	High/ moderate structured	1.5 – 3.0	4 (see Note 1)	4	3.5
		Weakly structured or massive	0.5 – 1.5			
4	Clay loams	High/ moderate structured	0.5 – 1.5	3.5 (see Note 1)	3.5	3
		Weakly structured	0.12 – 0.5			
		Massive	0.06 – 0.12			
5	Light clays	Strongly structured	0.12 – 0.5	3 (see Note 1)	3	2.5 (see Note 4)
		Moderately structured	0.06 – 0.12			
		Weakly structured or massive	< 0.06			
6	Medium to heavy clays	Strongly structured	0.06 – 0.5	2 (see Note 2)	2	(see Note 3)
		Moderately structured	< 0.06			
		Weakly structured or massive	< 0.06			

## NOTES:

- For Category 3 to 5 soils (loams to light clays), the drip irrigation system needs to be installed in an adequate depth of topsoil (in the order of 150 – 250 mm of *in situ* or imported good quality topsoil) to slow the soakage and assist with nutrient reduction.
- For Category 1, 2, and 6 soils, the drip irrigation system has a depth of 100 – 150 mm in good quality topsoil (see CM1 and M3.1).
- LPED irrigation is not advised for Category 1 or Category 6 soils – drip irrigation of secondary effluent is the preferred irrigation method.
- LPED irrigation for Category 5 soils needs a minimum depth of 250 mm of good quality topsoil (see M5 and CM7.1).

## **Appendix F AS/NZS 1547:2012 Table H4 – Design Flow Allowances: Commercial Premises**



**TABLE H4**  
**TYPICAL DOMESTIC WASTEWATER DESIGN FLOW ALLOWANCES**  
**– DOMESTIC WASTEWATER FROM COMMERCIAL PREMISES – NEW ZEALAND**

Source	Typical wastewater design flows (L/person/day)	
	On-site roof water tank supply	Reticulated community or a bore-water supply
Motels/hotels		
– guests, resident staff		220
– non-resident staff		30
– reception rooms		20 – 30
– bar trade (per customer)		20
– restaurant (per diner)		25 – 30
Tearooms/lunch bars (per customer)		
– without restroom facilities	10	15
– with restroom facilities	15	25
Community halls		
– banqueting	20	30
– meetings	10	15
School (pupils plus staff)		15 – 30
Rural factories, shopping centres	30	50
Camping grounds		
– fully serviced	100	130
– recreation areas	50	65
NOTE: These flows should be used for design purposes unless past experience demonstrates lower actual flows. Design flows should be based on the maximum figure in the range unless justification for lower values can be provided by way of actual water use data. Although guidance is provided for flow allowances for non-household activities, this Standard does not provide specific requirements for commercial loads, for example in commercial kitchens and laundries (see 1.9 definition of domestic wastewater).		

## **Appendix G    CON070 Planning Assessment**





# PLANNING ASSESSMENT SHEET

## APRIL 2021

OFFICE USE ONLY

Please complete the following and attach it to the back of the main consent application.

**This information is now required for all consent applications.**

*If you need help in filling out this form please contact our Customer Services staff on (03) 353-9007 or toll free 0800 EC INFO (0800 324 636). They will be able to provide some general assistance. Please note that depending on the scale and nature of the activity, a more detailed assessment may be asked for by the Consent Planner on any of the following.*

Accepted: YES / NO

**Please send this to:**  
 Environment Canterbury, PO Box 345, Christchurch 8140  
 or email to [ecinfo@ecan.govt.nz](mailto:ecinfo@ecan.govt.nz).

Please assess the proposed activity against the rules the proposed Land and Water Regional Plan (Decisions version) (Rule 5.8). Please provide an explanation where relevant.

### Canterbury Land and Water Regional Plan

**Rule 5.8 – The discharge of wastewater from a new, modified or upgraded on-site domestic wastewater treatment system onto or into land in circumstances where a contaminant may enter water**

Condition	Does your activity comply with this condition?	Explanation where relevant
1. The discharge volume does not exceed 2 m <sup>3</sup> per day; and	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	Discharge will be up to 5.65m <sup>3</sup> /day
2. The discharge is onto or into a site that is equal to or greater than 4 hectares in area; and	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
2a. The discharge is not located within an area where residential density exceeds 1.5 dwellings per hectare and the total population is greater than 1000 persons; and	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
3. The discharge is not onto or into land:		
(a) where there is an available sewerage network; or	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
(b) that is contaminated or potentially contaminated; or	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
(c) that is listed as an archaeological site; or	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
(d) in circumstances where the discharge would enter any surface water body; or	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
(e) within 20 m of any surface water body or the Coastal Marine Area; or	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
(f) within 50 m of a bore used for water abstraction; or	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
(g) within a Group or Community Drinking-water supply Protection Zone area as set out in Schedule 1; or	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
(h) where there is, at any time, less than 1 m of vertical separation between the discharge point and groundwater; and	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
5. The treatment and disposal system is designed and installed in accordance with Sections 5 and 6 of New Zealand Standard AS/NZS 1547:2012 – On-site Domestic Wastewater Management; and	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
6. The discharge does not result in wastewater being visible on the ground surface; and	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
7. The discharge does not contain any hazardous substance.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	

### Plan Change 1 to the Canterbury Land and Water Regional Plan

Regional Rules 5.7, 5.8 and 5.9 apply in the Selwyn Waihora catchment. Rules 11.5.1 and 11.5.2 apply as additions to Regional Rules 5.8 and 5.9.

**Rule 11.5.1 – Within the Selwyn Waihora catchment Regional Rule 5.8 shall include the following additional condition:**

1.	The discharge of wastewater from a new on-site domestic wastewater treatment system is not within the Cultural Landscape/Values Management Area.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
----	--	--	--

**Other Plans**

Please note that if the activity is covered by the [Opihi River Regional Plan](#) or [Waimakariri River Regional Plan](#), you will need to assess the activity against the rules in these plans below.

**Objectives and Policies**

Please indicate which regulations, objectives and policies are relevant to your proposal and provide brief comments (where relevant) to demonstrate why it is relevant and whether your proposal is consistent with it.

**NATIONAL ENVIRONMENTAL STANDARD FOR SOURCES OF HUMAN DRINKING WATER**

*The National Environmental Standard for Sources of Human Drinking Water is intended to reduce the risk of contaminating drinking water sources such as rivers and groundwater. It does this by requiring regional councils to consider the effects of activities on drinking water sources in their decision making.*

*Regulations 7 and 8 apply to water and discharge permits issued by regional councils. The resource consent requirements under these regulations apply only to water permits and discharge permits that have the potential to affect registered drinking water supplies that provide 501 or more people with drinking water for 60 or more calendar days each year.*

*Regulation 12 is relevant to activities that have the potential to affect a registered drinking-water supply that provides no fewer than 25 people with drinking water for not less than 60 days each calendar year.*

**Please indicate whether your proposal is consistent with the regulation, objective or policy and provide comments where relevant.**

Y	N	N/A	Regulation, objective or policy	Comment where relevant
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<a href="#">Regulation 7</a> – A Regional Council must not grant a water permit or discharge permit for an activity upstream of abstraction point where drinking water meets health quality criteria if the activity is likely to introduce or increase determinands in the drinking water so that it no longer meets the health quality criteria or aesthetic guideline values	No discernable adverse effects on down-gradient groundwater are predicted.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<a href="#">Regulation 8</a> – A Regional Council must not grant a water permit or discharge permit for an activity upstream of abstraction point where drinking water has not been tested or already does not meet health quality criteria if the activity is likely to introduce or increase determinands in the drinking water by more than a minor amount or so that it no longer meets the health quality criteria or aesthetic guideline values	No discernable adverse effects on down-gradient groundwater are predicted.
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<a href="#">Regulation 12</a> – Requires conditions on resource consent if activity may significantly adversely affect registered drinking-water supply	

**Regional Policy Statement 2013 – Revised 2017**

Y	N	N/A	Objective or Policy	Comment where relevant
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Objective 7.2.1 – (Sustainable management of fresh water) – ensure water resources are sustainably managed, while safeguarding the life-supporting capacity of ecosystems and the mauri of fresh water; the natural character of surface water bodies	No effects on surface water bodies are predicted
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Policy 7.3.6 – (Fresh water quality) – establish minimum water quality standards, manage activities which may affect water quality singularly and cumulatively to maintain water quality, and where water quality is below the minimum standard to avoid any additional discharge of contaminants	No discernable adverse effects on down-gradient groundwater are predicted. No effects on surface water.
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Policy 7.3.7 – (Water quality and land uses) - to avoid remedy or mitigate	

adverse effects of changes land uses on the quality of freshwater

No discernable adverse effects on down-gradient groundwater are predicted.  
No effects on surface water.

**Canterbury Land and Water Regional Plan**

**Objectives**

**Y N N/A**

Objective 3.1 – Recognise and enable Ngāi Tahu culture, traditions, customary uses and relationships with land and water

Kaitiakitanga of Ngai Tahu recognised

Objective 3.2 – Ki uta ki tai – recognising the connectivity between surface water, groundwater, fresh water, land and the coast

Potential effects of discharge from land, through soil to ground water and effect on surface water considered.

Objective 3.5 – Land uses develop and change in response to socio-economic and community demand

Proposal is in response to the wider needs of society regarding energy recovery

Objective 3.6 – Water is recognised as essential to all life and is respected for its intrinsic values

Objective 3.7 – Fresh water is managed prudently as a shared resource with many in-stream and out-of-stream values

Objective 3.8 – Safeguard the life-supporting capacity of ecosystems

Objective 3.8A – High quality fresh water is available to meet actual and reasonable foreseeable needs for community drinking water supplies

Objective 3.12 – When setting and managing within limits, regard is had to community outcomes for water quality and quantity

Objective 3.14 – High quality fresh water is available for community drinking water supplies

Objective 3.15 – Valued parts of rivers/lakes are suitable for contact recreation

Objective 3.16 – Freshwater bodies and their catchments are maintained in a healthy state, including through hydrological and geomorphic processes such as flushing and opening hāpua, flushing algal and weed

Objective 3.17 – Significant indigenous biodiversity values of rivers, wetlands.

Objective 3.18 – Maintain Wetlands that contribute to cultural/ community values, biodiversity, water quality, mahinga kai, water cleansing & flood mitigation

Objective 3.23 – Soils are healthy and productive, and human induced erosion and contamination are minimised

No adverse effects on soil quality are predicted

Objective 3.24 – Activities operate at good environmental practice or better to optimise efficient resource use and protect freshwater resources

Proposal not predicted to have any discernable adverse effect on fresh water quantity or quality

**Policies**

**Y N N/A**

Policy 4.1 – Lakes, rivers, wetlands and aquifers should meet freshwater outcomes

No predicted adverse effect to underlying aquifer.

- Policy 4.2 – The management of freshwater will take account of the fresh water outcomes, water quantity limits and the individual and cumulative effects of land uses, discharges...
- Policy 4.4 – Groundwater is managed so that (e) overall water quality in aquifers does not decline
- Policy 4.5 – Water is managed through the setting of limits to safeguard the life-supporting capacity of ecosystems, support customary uses, and provide for group of community drinking water...
- Policy 4.7 – Resource consents not granted where quality limit breaches or will be breached

Proposal not predicted to have any discernable adverse effect on ground water quality

No predicted adverse effect to quality of groundwater.

**Activity and resource policies**

**Y N N/A**

- Policy 4.12 – There are no direct discharges to surface water bodies or groundwater of:
  - (a) untreated sewage, wastewater (except as a result of extreme weather related overflows or system failures) or bio-solids;
  - (b) solid or hazardous waste or solid animal waste;
  - (c) animal effluent from an effluent storage facility or a stock holding area;
  - (d) organic waste or leachate from storage of organic material; and
  - (e) untreated industrial or trade waste
- Policy 4.13 – For other discharges of contaminants into or onto land where it may enter water or to surface water bodies or groundwater (excluding those passive discharges to which Policy 4.26 applies), the effects of any discharge are minimised by the use of measures that:
  - (a) first, avoids the production of the contaminant;
  - (b) secondly, reuses, recovers or recycles the contaminant;
  - (c) thirdly, reduce minimise the volume or amount of the discharge; or
  - (d) finally, wherever practical utilise land-based treatment, a wetland constructed to treat contaminants or a designed treatment system prior to discharge; and
  - (e) in the case of surface water, results in a discharge that after reasonable mixing meets the receiving water standards in Schedule 5
- Policy 4.14 – Any discharge of a contaminant into or onto land where it may enter groundwater (excluding those passive discharges to which Policy 4.26 applies):
  - (a) will not exceed the natural capacity of the soil to treat or remove the contaminant; and
  - (b) will not exceed available water storage capacity of the soil; and
  - (c) where meeting (a) and (b) this is not practicable, the discharge will:
    - i. meet any nutrient limits allowance in Schedule 8 or Sections 6 to 15 of this Plan; and
    - ii. utilise the best practicable option to ensure the size of any contaminant plume is as small as is reasonably practicable; and
    - iii. ensure there is sufficient distance between the point of discharge, any other discharge and drinking-water supplies to allow for the natural decay or attenuation of pathogenic micro-organisms in the contaminant

All wastewater is treated prior to discharge.

Drip field design and loading rate conservatively designed in accordance with AS/NZS 1547:2012 to minimise risk of over saturation.

- plume; and
- iv. not result in the accumulation of pathogens, or a persistent or toxic contaminant that would render the land unsuitable for agriculture, commercial, domestic, cultural or recreational use or water unsuitable as a source of potable water or for agriculture; and
- v. not raise groundwater levels so that land drainage is impeded

- Policy 4.14A – The disposal of domestic effluent and wastewater shall be managed so as to avoid any adverse effect that is more than minimal on surface and ground waters. Where residential density exceeds 1.5 dwellings per hectare and the total population is greater than 1000 persons, community reticulated systems should be promoted. Alternatively, other measures should be promoted to reduce adverse effects on water bodies from effluent disposal systems, including secondary treatment systems and septic tank warrants of fitness
- Policy 4.23 – Any water source used for drinking-water supply is protected from any discharge of contaminants that may have any actual or potential adverse effect on the quality of the drinking-water supply including its taste, clarity and smell and group and community drinking water supplies are protected so that they align with the CWMS drinking-water targets and meet the drinking-water standards for New Zealand
- Policy 4.81 – (Discharge does not adversely affect the significant values of wetlands, hapua, coastal lakes and lagoons)
- Policy 9.4.1 – (Protect the high quality, untreated groundwater sources available to Christchurch City as a potable water supply in the area shown on Planning Maps)

Rural location with population less than 1000.

**Other plans: The following plans, if relevant should be included in your overall planning assessment**

**The following sub-regional plans may apply to your activity**

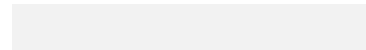
- Hurunui and Waiau River Regional Plan
- Waitaki Catchment Water Allocation Regional Plan
- Waimakariri River Regional Plan
- Waipara Catchment Environmental Flow and Allocation Regional Plan
- Pareora Catchment Environmental Flow and Water Allocation Regional Plan
- Opihi River Regional Plan
- Selwyn – Te Waihora Plan Change (Plan Change 1)
- Hinds Plan Change (Plan Change 2)
- South Canterbury Plan Change (Plan Change 3)
- Wairewa Plan Change (Plan Change 6)

**The following Regional Plan may apply to your activity**

- Omnibus Plan Change (Plan Change 4)

**Y N N/A**

- Policy of Regional Plan
- Policy of Regional Plan
- Policy of Regional Plan
- Policy of Regional Plan
- Policy of Regional Plan
- Policy of Regional Plan



**Other Matters**

**Section 105 – Matters relevant to certain applications**

Please provide an assessment of:

- (a) the nature of the discharge and the sensitivity of the receiving environment to adverse effects; and
- (b) the applicant's reasons for the proposed choice; and
- (c) any possible alternative methods of discharge including discharge into any other environment

If this has been discussed in the Consideration of alternatives section in the application form, please indicate below. Otherwise, please provide an assessment below.

Refer Assessment of Effects Report

**2. ASSESSMENT OF INVESTMENT VALUES (RENEWAL OF EXISTING CONSENTS ONLY)**

Please complete this section only if your application is to renew an existing consent.

Important: you must complete this question if your application is intended to replace a current resource consent, and this application will be lodged with Environment Canterbury at least 3 months before that consent expires.

- Provide an assessment of the value of your investment. You need to:

Specify the value of investment of the activities/infrastructure that are reliant on the resource consent/s you are applying for here. This must be the 'book value' of the investment (not the replacement value).

- < \$10,000
- \$10,000 to \$50,000
- \$50,000 to \$250,000
- \$250,000 to \$1,000,000
- \$1 Million to \$5 Million
- \$5 Million to \$50 Million
- > \$50 Million

- Include evidence that supports the assessment.

**Applicant/Consultant contact details:**

Surname (in full) DUDER First names (in full) PAUL  
 Postal address PO Box 2027, Shortland St, Auckland 1140.  
 Site address / Legal description Corner of Morven-Glanavy Rd, Glenavy, New Zealand.



Signature of applicant/person authorised to sign on behalf of applicant

26 July 2022

Date

## **Appendix H    CON070 Application for Consent to Discharge**







- Written approvals and a map that indicates the properties of people who have provided their written approval to your proposal (if applicable)
- Photographs of the soil profile
- A flood hazard assessment (If applicable)

### When you have completed this form

To submit your application and the relevant fixed charge or deposit, you need to either email it to [ecinfo@ecan.govt.nz](mailto:ecinfo@ecan.govt.nz), or send it to: **Environment Canterbury, PO Box 345, Christchurch 8140.**

**1 APPLICATION DETAILS**

Please complete all questions and sign and date the form.

**1.1 Applicant(s) details**

Surname:		First names (in full):	Mr
Surname:		First names (in full):	Mr
OR Registered Company name and number:	South Island Resource Recovery Ltd		
Postal address:	Level 1, 149 Victoria St, Christchurch	Postcode:	8013
Billing address (if different):		Postcode:	
Phone (home):		Phone (work):	
Cell phone:	027 494 3565	Email address:	kevin@sirrl.co.nz
Contact person:	Kevin Stratful		

Are you an Environment Canterbury staff member, an Environment Canterbury Commissioner, or a family member of either?  Yes  No

**1.2 Consultant/Agents details (if applicable)**

Contact person:	Paul Duder	Company:	Babbage Consultants Ltd
Postal address:	68 Beach Road, Auckland	Postcode:	1010
Phone (work):		Cell phone:	021 774 109
Email address:	pduder@babbage.co.nz		

1.2.1 During the processing of your application who will be the contact person for making decisions?  Applicant  Consultant / Agent

*Note: All correspondence during the consent application process will be directed to this contact person, unless instructed otherwise. Final decision documents will be sent to the applicant.*

1.2.2 Who will be the contact person for compliance monitoring matters?  Applicant  Consultant / Agent

**1.3 Names and addresses of the owner and occupier of the site to which this application relates**

(You only need to include this information if it is **different** to that of the applicant(s). If you do not own the land to which this application relates to, you will need to provide written approval from the land owner.)

Owner:		Phone:	
Postal address:		Postcode:	
Occupier:		Phone:	
Postal address:		Postcode:	

**1.4 Location of the proposed activity**

Site address:	Cnr Morven-Glenavy Road		
Locality (City/District):	Waimate	Map reference NZTopo50:	
Area of property (ha):	14.85ha	Legal description:	Lot 2 of RS22268 RT CB27B/314

*Note: The legal description can be found on the certificate of title, valuation notice, subdivision plan or rate demand for the site. Please include a copy of one of these with your application.*

**1.5 Consents from local authorities**

1.5.1 Under which territorial authority is the land situated:

Ashburton DC

Kaikōura DC

Timaru DC

Waitaki DC

Christchurch CC

Mackenzie DC

Waimakariri DC

Hurunui DC

Selwyn DC

Waimate DC

1.5.2 Do you require consent from the local authority for this proposal?

*Note: You may need to consult with the relevant local authority to determine this.*

Yes  No

1.5.3 **If yes**, please list: Land-use

1.5.4 If a consent is required from the District or City Council, have you applied for it?

Yes  No

1.5.5 **If yes**, what is the consent number and status? Applied for at same time as this application.

1.5.6 Please list any permitted activities under the District or City Plan that are part of the proposal to which the application relates:

**1.6 Current or previous consents**

**1.7**

1.6.1 Do you hold or have you held any previous consents at this site for this activity or any related activities?

Yes  No

*If yes, please provide details of the existing consents:  
(e.g. CRC111000, discharge of dairy effluent etc.)*

1.6.2 List any other consents required from the Canterbury Regional Council and indicate whether they have been applied for:  
Application being made as part of a broader set of consent applications to construct and operate an Energy from Waste Facility.

1.6.3 Is this application for a:  
 New activity  Existing Activity

Change of conditions for an existing consent  
*Advice note: If you have an existing discharge consent and you are proposing to increase the amount of contaminants to be discharged, i.e. increasing the number of cows to be milked, this will be processed as a new application.*

**2 PRE-APPLICATION ADVICE**

2.1 Have you received any advice from Environment Canterbury prior to lodging this application?  Yes  No

2.2 If yes, please list the pre-application number if known:  
*E.g. RMA165897. This number should be provided to you by the Consents Planner or Customer Services.*

Please list any pre-application meetings or advice (verbal and/or written) you have had with Environment Canterbury below:

Type of advice	Brief details, including who provided the advice and the date
<input type="checkbox"/> Meeting(s)	
<input type="checkbox"/> Verbal advice	
<input type="checkbox"/> Written advice	
<input type="checkbox"/> Other (e.g. submitted draft application / AEE)	

**3 BACKGROUND INFORMATION**

**3.1 Other consents at this property**

3.1.1 Is there an existing wastewater discharge at the property?  Yes  No

3.1.2 **If yes**, will the wastewater treatment and land application system proposed in this application replace the existing system?

3.1.3 Please provide details of the existing treatment and land application system and why it is being replaced (e.g. soakhole, sand trench).

*Note: If there is an existing wastewater discharge on the property, please provide a plan showing the location of the existing discharge*

3.1.4 If you are applying for resource consent due to the failure of your current system, please explain why the existing system has failed, and how wastewater is currently being dealt with at the site.

*(e.g. there is a blockage in the distribution pipe and wastewater is ponding on the land surface, wastewater is currently being tankered off-site for disposal.)*

**4 DESCRIPTION OF THE PROPOSED ACTIVITY**

**4.1 Single Lots and Subdivisions**

4.1.1 Does this application relate to a discharge from a single lot or multiple lots?  Single Lot  Multiple Lots (Subdivision)

*If the application is for a single lot, please proceed to section 4.2.  
If the application is for multiple lots within a subdivision, please complete the following questions:*

4.1.2 Has resource consent for the subdivision been granted?  Yes  No

4.1.3 **If yes**, please state the subdivision consent number if known.

4.1.4 How many lots are in the subdivision?

*Note: Resource consents are generally granted with a five year lapse date. If the consent is not given effect to prior to this date, the resource consent will lapse, and is no longer valid. If you consider construction of the subdivision may take more than 5 years, you may wish to request an extended lapse date for your resource consent.*

4.1.5 Do you require a longer lapse date for your resource consent?  Yes  No

Requested length:

4.1.6 Do you require a resource consent for each lot?  Yes  No

4.1.7 **If no**, will the wastewater be **treated** in a decentralised treatment system, or will treatment occur via individual onsite systems?  Onsite Treatment Systems; or  Decentralised Treatment System

4.1.8 Who will be legally responsible for maintenance of the treatment and land application system(s)?

1.1.1 Has a body corporate or similar been established to ensure legal responsibility for the maintenance of the treatment and land application system?  Yes  No

**If yes**, please attach a copy of the body corporate agreement to this consent application.

4.1.9 **If no**, please state how you will ensure that the system will be maintained for the duration of the resource consent.

**Please attach a map showing the subdivision layout and the location of the treatment and discharge systems to this application form**

**4.2 Discharges from domestic dwellings**

4.2.1 Is the discharge only **domestic** wastewater from a dwelling?  Yes  No

**If yes**, please complete this section of the application form and then proceed to Section 4.4.

**If no**, please complete this section (if relevant) and then proceed to Section 4.4.

4.2.2 How many dwellings will you discharge from?	N/A
4.2.3 How many bedrooms in each dwelling?	N/A
4.2.4 How much wastewater will be produced per day per dwelling?	5,625 Litres per day (maximum)

*Note: The table below may assist you in determining how much wastewater will be produced per day per dwelling.*

Number of bedrooms	Daily flow (Litres)
1-3	1000
4	1400
5	1600
6	2000

4.2.5 If the volume of wastewater discharged is not consistent with the volumes listed in the above table please state why, citing any references to support your estimates. refer attached Technical Report 14

4.2.6 Are you proposing any specific measures to ensure the volume of wastewater discharged does not exceed your estimate?  Yes  No

4.2.7 **If yes**, please list them below (e.g. flow monitoring, water restriction devices) flow monitoring

4.2.8 Are seasonal fluctuations in the volume of wastewater discharged likely?  Yes  No

4.2.9 **If yes**, please state how these fluctuations will affect the performance of your treatment system:

**4.3 Discharges from other sources**

- 4.3.1 Will there be a discharge from any sources other than domestic dwellings?  Yes  No
- 4.3.2 **If yes**, what other sources? Please provide a description of the facility:  
(e.g. school, residential care facility, restaurant etc).
- 4.3.3 What contaminants other than domestic wastewater will be discharged? (e.g. hairdressing chemicals, photography chemicals, butchery etc)
- 4.3.4 Will these contaminants be treated and discharged via your wastewater treatment and land application system?  Yes  No
- 4.3.5 **If no**, please state how these contaminants will be disposed of:
- 4.3.6 **If yes**, please state what specific treatment devices you are proposing to treat these contaminants (e.g. grease traps for kitchens, etc):
- 4.3.7 What is the total number of visitors/customers and/or staff at the site per day?
- 4.3.8 What is the total volume of wastewater that will be discharged per day?
- 4.3.9 How have you determined how much wastewater will be discharged?

*Note: guidance on discharge volumes for a range of operations can be found in the Australian / New Zealand Guidelines for Onsite Domestic Wastewater Management (AS/NZS 1547:2012).*

**4.4 Design of treatment system**

- 4.4.1 What type of wastewater treatment system is proposed?  
 Septic tank                       Aerated treatment system                       Packed bed reactor  
 Other, please specify: Refer attached Technical Report 14

4.4.2 If septic tank, how many chambers does the system have?

*Note: If your treatment system is not one of the systems listed above, please attach to this application form information on how the system will treat the wastewater and what level of treatment the system will provide. If you don't provide this information there may be significant delays and costs while this information is obtained.*

- 4.4.3 What model of system is proposed?
- 4.4.4 What is the operating capacity of the treatment system?
- 4.4.5 What is the total capacity of the treatment system?
- 4.4.6 Will the proposed system have a grease trap?  Yes  No
- 4.4.7 **If yes**, what is the type and capacity of the grease trap?
- 4.4.8 Will the wastewater pass through a proprietary filter prior to discharge to land?  Yes  No
- 4.4.9 How will the wastewater be distributed to the land application system?  
 Pump  Siphon  
 Other, please specify:

*Note: Environment Canterbury discourages the use of gravity-fed systems*



**4.5 Treatment Quality**

4.5.1 Will the discharge be UV treated?  Yes  No

4.5.2 Will the discharge be chlorinated?  Yes  No

*Note: If you are proposing a treatment system which includes chlorination, a detailed assessment of the effects of chlorine on the environment will be required in section 7 of this application form.*

4.5.3 What is the expected quality of treated wastewater being discharged from the treatment system?

Biochemical Oxygen Demand (BOD5)	<30 mg/L
Total Suspended Solids (TSS)	<45 mg/L
Faecal coliforms (FC)	<1,000 cfu/100mL
Total Nitrogen (TN)	25-100 mg/L
Nitrate nitrogen (NO <sub>3</sub> -N)	25-100 mg/L

4.5.4 Please give details of the performance data that is the basis for the above expected quality claims:

AS/NZS 1547:2012

**Please attach a map to this application form which shows the following:**

- **The location of the dwelling;**
- **The location of your test pits;**
- **The location of the land application system and the distance to all property boundaries, wells, watercourses, stormwater swales, drains, springs;**
- **An arrow indicating north; and**
- **A statement as to whether the map is to scale.**

**Please ensure the map is of sufficient quality to be attached to the consent document if required.**

**4.6 Design of land application system**

4.6.1 What type of land application system is proposed?

Dripline Irrigation System  Sand Trench System  Other - please Specify:

*Note: If you are **not** proposing a dripline irrigation system, or sand trench system, please provide full details of the design of your land application system, a plan showing a cross section of the land application system and details and supporting evidence demonstrating how it treats contaminants in the discharge.*

4.6.2 Will the perimeter of the land application system be fenced to prevent vehicle stock and public access?  Yes  No

4.6.3 **If no**, please state how you will clearly demarcate the area of the land application system (e.g. signage):

*Note: It may be a requirement of your District or City Council to fence the land application system. We advise you to check this with the appropriate council.*

Please complete section 4.6.4 if you are proposing a drip irrigation system, and section 4.6.5 if you are proposing a sand trench system.

4.6.4 Dripline irrigation systems

- What type of irrigation lines are proposed?
  - Pressure compensating drip irrigation lines
  - Low pressure effluent lines
- Total length of irrigation lines: 

2,000metres	Approx
-------------	--------
- Distance between irrigation lines: 

1	metres
---	--------
- Spacing between drip emitters: 

600	millimetres
-----	-------------
- Area of land application system: 

2,000square metres
--------------------

  
*(i.e. length of irrigation lines (m) multiplied by distance between the lines).*
- If you intend to install your irrigation lines more than one metre apart, please state how you will ensure even distribution of wastewater across the land application system: 

--
- Application rate: 

3.5	millimetres / day
-----	-------------------

  
*(equals the maximum wastewater flow in L/day ÷ the effective area of land of the application system in m<sup>2</sup>)*
- Where will the irrigation lines be installed?
  - mm above ground level
  - 100 mm below ground level
  - On the ground surface
- Will the irrigation lines be covered with between 100 and 150 millimetres of soil?  Yes  No

Note: Environment Canterbury discourages the use of drip irrigation tubing that is not covered with soil.

- Will the soil above the drip irrigation tubing be permanently grassed or vegetated?  Yes  No
- What vegetation will be provided within the disposal area? 

Grass (likely Ryegrass)
-------------------------
- If the soil above the drip irrigation tubing will not be grassed or planted, please explain why: 

--

Note: It may be a requirement of your District or City Council to plant the land application system with certain plants. They may have a list of plants for this purpose. We advise you to check this with the appropriate council.

4.6.5 Sand trench systems

- Trench length: 

	metres
--	--------
- Trench width: 

	metres
--	--------
- Spacing of holes on the distribution pipe(s) 

	millimetres
--	-------------
- Area of land application system: 

	square metres
--	---------------

  
*(i.e. trench width (m) x trench length (m))*
- If you are proposing a trench with multiple distribution lines spaced more than 600 millimetres apart, please provide evidence to demonstrate that even distribution of wastewater will be achieved across the width of the trench: 

--
- Application rate: 

	millimetres / day
--	-------------------

  
*(maximum wastewater flow L/day ÷ effective area of land application system in m<sup>2</sup>)*
- What is the treatment material?
  - 2A sand
  - Other, please specify:

Note: If you are not proposing to install 600 mm of 2A sand, please attach evidence (i.e. scientific publications and/or experimental field data) which clearly demonstrates the expected concentration of bacteria and/or viruses

at the base of the treatment material.

- What is the depth (thickness) of treatment material?
- What depth below ground level will the base of the treatment system be installed?  
*(i.e. the base of the 2A sand or other treatment material)*
- Will free draining material be installed at the base of the treatment material?
- **If no**, how will you ensure drainage of wastewater at the base of your land application system?

millimetres	
<input type="checkbox"/>	mm above ground level
<input type="checkbox"/>	mm below ground level
<input type="checkbox"/>	On the ground surface
<input type="checkbox"/>	Yes <input type="checkbox"/> No

**4.7 Maintenance**

- 4.7.1 Will you submit a letter signed by the person responsible for designing the system or another person experienced in the design of on-site wastewater systems to Environment Canterbury within one month of construction, to certify that the system is constructed and installed in accordance with the design plans?
- 4.7.2 What is the manufacturer’s recommended service frequency for the proposed treatment and land application system?
- 4.7.3 Will your proposed treatment and land application system be serviced at the above frequency by a person experienced in the servicing of on-site wastewater systems?
- 4.7.4 If you are proposing a drip irrigation land application system with a service frequency of less than two services per year, or a sand trench land application system with a service frequency of less than one service per year, please provide details as to why your system does not need to be maintained at these frequencies:

<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No
<input type="checkbox"/>	Yearly servicing		
<input type="checkbox"/>	Two times a year		
<input checked="" type="checkbox"/>	Other (please specify) TBC		
<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/>	No
N/A			

4.7.5 Please indicate if regular servicing will include the following:

- (i) Ensuring all access points on the treatment system are readily accessible for maintenance purposes  Yes  No
- (ii) Measuring the depth of solids and scum in the treatment tank(s)  Yes  No
- (iii) Pumping out the wastewater system if the solids and scum layers combined are greater than one half of the depth of the treatment tank  Yes  No
- (iv) Checking the outlet filter and cleaning it if necessary  Yes  No
- (v) Checking that the pump or siphon and/or float switches are working  Yes  No
- (vi) Checking and flushing distribution lines until water runs clear  Yes  No
- (vii) Pressure testing at the end of the distribution pipe(s)  Yes  No
- (viii) Maintenance of the vegetative cover  Yes  No

4.7.6 If you have ticked no to any of the maintenance procedures listed in (i) to (vii) above, please explain why this maintenance is not required:

4.7.7 Please specify any other servicing requirements for your proposed system and why this servicing is required:

4.7.8 Will you retain records of any servicing carried out on your system and make these available to Environment Canterbury on request?  Yes  No

## 5 LEGAL AND PLANNING MATTERS

### 5.1 Please classify the proposed activity against the relevant rule(s) in the relevant regional plan

5.1.1 Which regional plan does this activity fall under?

LAND AND WATER

5.1.2 Please list the relevant rule(s) of this plan:

5.8 AND 5.9

5.1.3 What is the status of this activity?

Controlled  Restricted discretionary  Discretionary  Non-complying

In the table below, please provide a full assessment of the proposed activity against the above rule(s), including an assessment against each condition of each relevant rule.

Provide an explanation where relevant to demonstrate how your activity complies with the condition of the rule, or why it doesn't comply

### 5.2 Land and Water Regional Plan

Rule 5.8 - The discharge of wastewater from a new, modified or upgraded on-site domestic wastewater treatment system onto or into land in circumstances where a contaminant may enter water

Condition	Can you comply with this condition?	Explanation where relevant
1. The discharge volume does not exceed 2 m <sup>3</sup> per day; and	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	
2. The discharge is onto or into a site that is equal to or greater than 4 hectares in area; and	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
2a. The discharge is not located within an area where residential density exceeds 1.5 dwellings per hectare and the total population is greater than 1000 persons; and	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
3. The discharge is not onto or into land:	<b>Can you comply?</b>	
(a) where there is an available sewerage network; or	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
(b) that is contaminated or potentially contaminated; or	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
(c) that is listed as an archaeological site; or	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
(d) in circumstances where the discharge would enter any surface water body; or	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
(e) within 20 m of any surface water body or the Coastal Marine Area; or	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
(f) within 50 m of a bore used for water abstraction; or	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
(g) within a Group or Community Drinking-water supply Protection Zone area as set out in Schedule 1; or	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
(h) where there is, at any time, less than 1 m of vertical separation between the discharge point and groundwater; and	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
4. The treatment and disposal system is designed and installed in accordance with Sections 5 and 6 of New Zealand Standard AS/NZS 1547:2012 – On-site Domestic Wastewater Management; and	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
5. The treatment and disposal system is operated and maintained in accordance with the system's design specification for maintenance or, if there is no design specification for maintenance, Section 6.3 of New Zealand Standard AS/NZS 1547:2012 – On-site Domestic Wastewater Management; and	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	

6.	The discharge does not result in wastewater being visible on the ground surface; and	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	
7.	The discharge does not contain any hazardous substance.	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	

**5.3 Proposed Variation 1 to the Proposed Canterbury Land and Water Regional Plan**

Regional Rules 5.7, 5.8 and 5.9 apply in the Selwyn Waihora catchment. Rules 11.5.1 and 11.5.2 apply as additions to Regional Rules 5.8 and 5.9.

Rule 11.5.1 - Within the Selwyn Waihora catchment Regional Rule 5.8 shall include the following additional condition:

Condition	Can you comply with this condition?	Explanation where relevant
1. The discharge of wastewater from a new on-site domestic wastewater treatment system is not within the Cultural Landscape/Values Management Area.	<input type="checkbox"/> Y <input type="checkbox"/> N	N/A

**5.4 Other Plans**

The [Opihi River Regional Plan](#) and [Waimakariri River Regional Plans](#) also contain rules which relate to discharges of wastewater onto or into land. If your site is located in an area covered by either of the above plans, and your discharge is either within 20m of a surface waterbody, or may result in the discharge entering surface water, you will need to assess your activity against the relevant plan in the box below:

N/A

*If you are unsure please contact Customer Services who may be able to help you answer this question.*

**5.5 Please provide an assessment of the proposed activity against any relevant objectives, policies or other provisions of any National Policy Statements, Coastal Policy Statements, National Environmental Standards, the Canterbury Regional Policy Statement, and any other relevant plan or proposed plan. A list of policies and objectives relevant to this proposal may be found in the planning assessment which accompanies this form.**

Refer attached Technical Report 14 and AEE

**5.6 The purpose of the Resource Management Act (1991) is to promote the sustainable management of natural and physical resources. Does your proposal meet the requirements of Part 2, Section 5 (view here)?**  Y  N

PRINCIPLES

**5.7 Matters of National Importance (section 6 - view here))**

5.7.1 Do you consider your proposed activity takes into account the Matters of National Importance?  Y  N

**5.8 Other Matters (section 7 - view here)**

5.8.1 Do you consider your proposed activity takes into account Other Matters?  Y  N

## 5.9 Treaty of Waitangi (section 8 - view here)

5.9.1 Do you consider your proposed activity take into account the principles of the Treaty of Waitangi?

Y  N

## 6 CONSULTATION AND WRITTEN APPROVAL OF AFFECTED PERSONS

Consultation with all persons potentially affected by your activity prior to lodging your application may result in considerable time and cost savings.

### Ngāi Tahu in Canterbury

Te Rūnanga o Ngāi Tahu is the statutory authority representing iwi members and includes ten local rūnanga within Canterbury, known as Papatipu Rūnanga. 'Papatipu' refers to ancestral land. Local rūnanga have the status of mana whenua with kaitiaki status (guardianship) over land and water within their takiwā (territory).

Depending on where the activity is to occur within Canterbury, the values of one or more Papatipu Rūnanga may be affected. Iwi interests as a whole may also be affected where an activity is to occur within, adjacent to, or affecting an area recognised in the Ngāi Tahu Claims Settlement Act 1998 as a Statutory Acknowledgement area. In those circumstances, Te Rūnanga o Ngāi Tahu will be involved in management of the area.

For more detail on Ngāi Tahu and assistance with answering the question below, please refer to the booklet titled [Ngai Tahu in the Resource Consent Process](#), which is also available from our Customer Services Section. You may also find our webpage [Engaging with Ngai Tahu](#) useful.

Have you consulted with the Papatipu Rūnanga and/or Te Rūnanga o Ngāi Tahu?  Yes  No

If 'Yes', please state who you have consulted with and attach any evidence of your consultation, including any written approvals for this application:

**Note:** Ngāi Tahu as an iwi, and specifically Papatipu Rūnanga representing mana whenua, are considered an affected party where effects on cultural values are minor or more than minor, in accordance with Section 95E of the RMA. Environment Canterbury MUST notify an application if the adverse effects of your proposed activity on cultural values are determined to be minor or more than minor unless you have obtained the written approval of Papatipu Rūnanga and/or Ngai Tahu for your proposal. Consultation before lodging your application is one of the best ways of identifying adverse effects.

### Non-notified applications

Non-notified consents are for activities which have minor adverse effects on the environment. For your activity to be considered on a non-notified basis you must determine whether there are any persons potentially affected by your proposed activity and if there are, you must consult them and obtain their written approval (e.g., Iwi, Fish and Game Council, Department of Conservation, Land Information New Zealand, Owners of nearby structures/infrastructure (e.g. NZTA), Other consent holders, Neighbouring land owners and occupiers, Environment Canterbury River Engineering). If you are unsure who may be an affected party, please call us. Non-notified consents are significantly cheaper and quicker to process.

### Limited notified and fully notified applications

Notified consents (either limited notified or fully notified consents) are for activities which do not meet requirements in the RMA for processing on a non-notified basis.

If your assessment of effects has shown that adverse effects on the environment are likely to be more than minor and/or there are people who may be adversely affected from whom you are unable to obtain written approval, you may wish to request that your application be publicly notified. This will avoid possible delays in the processing of your application.

The final decision to notify or not notify an application will still be made by Environment Canterbury.

Please note that an application cannot be notified unless there is sufficient information for the notice that makes it clear what is being applied for, and how it might affect the environment (including people).

I request that my application is notified.  (check box)

Please provide any consultation details and written approvals obtained in the space provided below.

**6.1 Consultation details**

6.1.1 Have you consulted with iwi?  Yes  No

6.1.2 **If yes**, who did you consult?

6.1.3 Have you consulted with any neighbours or other parties who may be affected by your proposal?

6.1.4 **If yes**, please state who you have consulted with, and provide any evidence of your consultation:

6.1.5 How have you addressed any concerns they may have had?


**6.2 Written approval of affected parties**

6.2.1 Have you obtained any written approvals from any persons for your proposed activity?  Yes  No

**If yes**, please give their details below. Please note that for us to accept the approvals they must each complete and sign form CON510.

Name	Address	Contact details (phone, email etc.)

**7 DESCRIPTION OF THE AFFECTED ENVIRONMENT AND ASSESSMENT OF ACTUAL & POTENTIAL EFFECTS OF THE ACTIVITY ON THE ENVIRONMENT**

You must include an assessment of the effects of your proposal on the environment in this part of your application.

[Section 88](#) of the Resource Management Act 1991 requires that each application includes an assessment of the actual and potential effects of the activity on the environment. This assessment must be prepared in accordance with the [Fourth Schedule](#) of the Resource Management Act. A copy of this schedule is available [online](#) or from Customer Services.

The assessment of effects will differ for each application depending on the type and scale of the activity. Consultation is one of the best ways of identifying adverse effects. Please contact Customer Services with any questions on [ecinfo@ecan.govt.nz](mailto:ecinfo@ecan.govt.nz) or via phone on (03) 353 9007 or 0800 324 636 (0800 EC INFO).

For further assistance in preparing this assessment, you may find the Ministry for the Environment Publication "[A guide to preparing a basic assessment of environmental effects](#)" useful.

*Note: If the section below is not fully completed, your application may be returned as incomplete. Please ensure all questions are answered in full.*



You can obtain most of the following information from our GIS mapping programme Canterbury Maps which you can access on the Environment Canterbury website:: <http://ecan.govt.nz/services/online-services/gis-mapping/pages/enter-gis.aspx>

Alternatively you can contact Customer Services who may be able to help you obtain some of the following information.

**7.1 Topography**

- 7.1.1 What is the gradient of the slope at the site of your land application system?
  - <10 degrees
  - 11 – 15 degrees
  - More than 15 degrees
- 7.1.2 How was this determined?
 

Land to be contoured
Field will be elevated
- 7.1.3 If the land application system will be located on land with a steep gradient (15o or greater), what measures will you use to prevent run-off of wastewater?
- 7.1.4 What measures will you use to prevent surface water or stormwater entering the land application system? (e.g. cut-off drains etc).

**7.2 Soil**

To determine the soil profile at your site, a test pit should be dug on or close to the location of your land application system.

- 7.2.1 In the box below, please specify the soil and subsoil types at the location of the land application system (e.g. gravels, sands, sandy loams, loams, clay loams, light clay, medium to heavy clay etc) and the thicknesses of each of these soil layers.

**Note: the soil must be profiled to a depth of at least 600 millimetres below the discharge point (e.g. 600 mm below the drip irrigation lines or 600 mm below the base of the 2A sand layer in the sand trench).**

Soil Type and category	Thickness of layer
refer attached Technical Report 14	mm
	mm
	mm
	mm
	mm

- 7.2.2 How was the soil profile determined? ( e.g. via a test pit).
 

Refer attached Technical Report 14
------------------------------------
- 7.2.3 How many test pits were excavated and where?

**Please indicate the location of the test pit(s) on your location map**

- 7.2.4 What were the depths of these holes?
- 7.2.5 What date were these holes excavated?
- 7.2.6 What is the least permeable soil type and category observed in the test pit? (Please use Table E.1 of the AS/NZS 1547:2012 standards for the assessment of soil textures and types).
- 7.2.7 Is your proposed application rate appropriate for the least permeable soil type observed and consistent with Table M1 of the AS/NZS 1547:2012 standards?
  - Yes  No

- 7.2.8 **If no**, please explain how you will ensure the infiltration capacity of the soil is not exceeded:

**Please attach colour photographs of your test pit(s) to your application.**



**7.3 Groundwater**

**7.3.1 Groundwater Direction**

- In what direction does groundwater flow beneath your property, e.g. northwest to south east?
- How have you determined the groundwater flow direction?

Generally West to East

Ground water level monitoring

**7.3.2 Aquifer Type**

- What type of aquifer is your discharge located over?

Coastal confined

Semi-confined/unconfined

Neither

*Note: If your discharge will occur within the Christchurch Groundwater Protection Zones 1, 1A, 1B, 1C, 1D or 2, a detailed assessment of the effects of the discharge on groundwater quality will be required in section 7.4 of this form*

**7.3.3 Depth to Groundwater**

- Was groundwater observed in the test holes?  Yes  No
- **If yes**, at what depth below ground level? millimetres
- Were any iron stains or signs of mottling observed in the test holes?  Yes  No
- **If yes**, at what depth below ground level? millimetres
- Have you taken groundwater readings from your on-site well or a neighbouring well that might indicate the water table level below your property?  Yes  No
- **If yes**, please state the well number, the distance from your land application system, and the observed groundwater level recorded and the date the reading(s) were taken:
- Does Environment Canterbury have groundwater level data for wells located within one kilometre of your property? (You can find groundwater level data on our online GIS system)  Yes  No
- **If yes**, please complete the following table:

Well Number	Well depth (metres)	Distance (in metres) and direction from land application system	Highest groundwater reading (metres below ground level) (please ensure you subtract the measuring point)	Number of readings	Years readings were taken
Example: L35/0241	8.9	180m NW	2.6	87	1973 to 1989
J41/0050	9.8	350m SE		143	1951 to 1999

- If any of these groundwater readings are not relevant to your property, please explain why (e.g. your property is on a higher terrace than these wells, the groundwater below your property is artesian, etc.)
- Based on the above analysis, what is your assessment of the highest potential seasonal groundwater level at the site?

metres below ground level

**7.4 Groundwater Quality**

7.4.1 Does Environment Canterbury have groundwater quality data for wells located within one kilometre of your property?  Yes  No

7.4.2 **If yes**, please complete the following table:

Well number	Well depth (metres)	Distance (in metres) and direction from land application system	Number of samples taken	Highest concentration of bacteria in all samples taken	Highest concentration of nitrate nitrogen in all samples taken	Years readings were taken
Example: L35/0241	8.9	180 m NW	5	18 cfu/100 ml	4.5 mg/100 ml NO <sub>3</sub> -N	Between 1999 & 2006

7.4.3 If any of these readings are not relevant to your property, please explain why:

7.4.4 Based on the above analysis, what is the likely maximum concentration of nitrate nitrogen in the groundwater surrounding your site?

7.4.5 How was this determined?

7.4.6 What is the likely concentration of faecal coliform bacteria or *E. coli* in the groundwater surrounding your site?

7.4.7 How was this determined?

7.4.8 Are there any discharges to land (including any other wastewater discharges) within 500 metres of your property? (e.g. dairy shed effluent discharges, meat works discharges, wastewater discharges etc.)

mg/L nitrate nitrogen
cfu/100 mL MPN/100mL

Yes  No

7.4.9 **If yes**, please specify details and consent numbers if known:

7.4.10 Is the property listed on Environment Canterbury's Listed Land Use Register (LLUR) or is being/has been used for any HAIL activity?

--

Yes  No

7.4.11 **If yes**, please provide details:

--

Note: To find out if the property is listed on the LLUR please see <http://llur.ecan.govt.nz/>  
 HAIL activities are listed on the Ministry for Environment's Hazardous Activities and Industries List. More information on HAIL activities can be found at [www.mfe.govt.nz/issues/hazardous/contaminated/hazardous-activities-industries-list.html](http://www.mfe.govt.nz/issues/hazardous/contaminated/hazardous-activities-industries-list.html).

**7.5 Adverse effects of the discharge on groundwater quality**

**7.5.1 Nitrate-nitrogen**

- What is the expected concentration of nitrogen in the wastewater exiting the treatment system (e.g. exiting the septic tank or aerated treatment system)?
- What testing have you undertaken and/or what data have you used to determine

25-100mg/L of nitrate nitrogen 25-100mg/L of total nitrogen
Performance requirement for system

this?

Please attach test results to demonstrate treatment capability for the proposed system.

- Will your land application system provide any additional removal of nitrate nitrogen?
- **If yes**, please state the expected nitrate-nitrogen concentration at the point the discharge enters groundwater, **and** state how your land application system provides additional removal:
- What evidence have you relied on to determine this?
- Please provide a detailed assessment of the effect the discharge of nitrate-nitrogen will have on groundwater quality, including evidence to support your assessment.

Yes  No

Additional removal through uptake of nitrogen in root zone of grass

**7.5.2 Pathogens**

- What is the expected concentration of faecal coliform bacteria exiting your wastewater treatment system (e.g. exiting the septic tank or aerated treatment system)?
- What testing have you undertaken and/or what data have you used to determine this?
- Please attach test results to demonstrate the treatment capability.
- What is the distance between the base of your land application system and highest groundwater level?

<1,000fu/100 mL
System performance requirement
metres

*Note: the base of the land application system is defined as the discharge point, which is the level of the drip irrigation lines, or the base of the 2A sand in a sand trench.*

- Will your land application system provide any additional removal of pathogens from the discharge?
- **If yes**, please state the expected pathogen concentration at the point the discharge enters groundwater, describe how this has been calculated, **and** state how your land application system provides additional removal:
- What evidence have you relied on to determine this?
- Please provide a detailed assessment of the effect the discharge of pathogens will have on groundwater quality, including evidence to support your assessment.

Yes  No

**7.5.3 Cumulative Effects**

*Where several discharges exist in close proximity to one another, adverse cumulative effects on groundwater quality may occur. This occurs as a result of insufficient separation between discharges to allow dilution of nitrate nitrogen in groundwater.*

- What is the distance between your proposed land application system and the nearest discharge?
- Please provide an assessment of the cumulative effects this discharge in combination with other discharges (or existing water quality) will have on groundwater quality.

Approx 1,200m; single dwelling

**7.6 Drinking Water Supplies**

7.6.1	Where is the drinking water for the property sourced? (E.g. public supply, private well, rainwater tank)	Likely private well
7.6.2	<b>If provided by a well</b> , please state the well number and the distance and direction from the land application system:	Yet to be applied for
7.6.3	Where do your neighbours obtain their drinking water supplies from?	Rain water
7.6.4	<b>If provided by a well</b> , please state the well number and the distance and direction from the land application system:	
7.6.5	Are there any community drinking water supply wells or intakes, group drinking water supply wells, or National Environmental Standard registered drinking water abstraction points within a 2,000 m radius of your land application system?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
7.6.6	<b>If yes</b> , please state the location of these wells (relative to your land application system):	
7.6.7	Is your land application system within the water supply protection zone of a private, group or community drinking water supply well?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
7.6.8	<b>If yes</b> , please provide a detailed explanation as to why your discharge will not adversely affect the owner of this bore from abstracting a potable drinking water supply:	
7.6.9	Where is the closest groundwater bore (not used for community supply) to your land application system? <i>(Please state the well number, distance and direction from your land application system)</i>	

*Note: All well locations shown in Environment Canterbury's GIS database are indicative only. All locations should be confirmed via consultation with well owners or by site visits.*

**7.7 Flood Potential**

7.7.1	Has a flood hazard assessment ever been undertaken on your property?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<i>Note: To find out about flood hazard assessments on your property, please contact Customer Services.</i>		
7.7.2	<b>If yes</b> , please provide details, and attach a copy of the flood hazard assessment to the application form:	Refer separate Flood Assessment
7.7.3	Has the site of your land application system ever experienced flooding from either rainfall events or river overflows?	<input type="checkbox"/> Yes <input type="checkbox"/> No
7.7.4	<b>If yes</b> , how often does your property experience flooding?	
7.7.5	Has the site of the proposed land application system ever been covered with water from a river in flood or from rainfall?	<input type="checkbox"/> Yes <input type="checkbox"/> No
7.7.6	<b>If yes</b> , please explain state what measures you are proposing to prevent flooding of the land application system:	

**7.8 Adverse effects of the discharge on human and stock health**

**7.8.1 Drinking water supplies**

<ul style="list-style-type: none"> <li>• What effect will your discharge have on the drinking water supplies of neighbouring properties? Please explain your answer.</li> </ul>	None as neighbouring residential properties use rainwater
---	---

**7.8.2 Contact with pathogens**

<ul style="list-style-type: none"> <li>• What is the distance between your land application system and the closest property boundary?</li> </ul>	20 metres
--	-----------

- How will you prevent emergence of wastewater at the land surface and adverse effects on public health?

Contingency applied to both people number and area calculation provides significant contingency against saturation.

*Note: If you are in an area with poor drainage (e.g. over the coastal confined aquifer system) during periods of heavy rainfall the soils at your site are likely to become saturated. When soils become saturated, the ability of the soils to remove pathogens is reduced, and drainage of wastewater may not occur.*

*When designing your land application system you will need to consider how you will ensure that the discharge always occurs into unsaturated soil, particularly where you are close to neighbouring property boundaries. You may wish to consider options such as mounding your land application system to ensure the treatment material remains unsaturated and greater separation between your land application system and property boundaries.*

**7.9 Surface Water**

7.9.1 Please state the location, including distance and direction of the nearest surface waterbodies to your land application system:

20m North

Note: the term surface waterbody includes rivers, streams, springs, drains, artificial watercourses, wetlands and stockwater races)

7.9.2 Name of surface water body:

Whitneys Creek

**7.10 Adverse effects of the discharge on surface water quality**

7.10.1 Please provide an assessment of the effect the discharge of wastewater will have on surface water quality, including evidence to support your assessment:

No closer than 20m to waterway, drip field contoured to direct any surface flow away from waterway, drip field area conservatively calculated to mitigate against saturation

**7.11 Adverse effects on Ngāi Tahu Values and historic values**

For assistance with answering the below questions, please refer to the booklet titled [Ngāi Tahu in the Resource Consent Process](#) which is also available from our Customer Services Section, further information is available [here](#). [Iwi Management Plans](#) are available to help applicants identify matters of importance to iwi. These plans also provide direction on how best to avoid, remedy or mitigate effects on cultural values.

7.11.1 Which Papatipu Rūnanga cover(s) the site where the proposed activity is to occur?

Te Runanga o Waihao

7.11.2 Is the proposed activity occurring within, adjacent to, or likely to affect a Statutory Acknowledgement Area?

Yes  No

7.11.3 Is the proposed activity within a silent file area?

Yes  No

7.3.12 Please provide an assessment of the effects of the proposed activity on Ngāi Tahu values. To do this you will need to reference the relevant policies in the [Iwi Management Plans](#). Where appropriate, this assessment may include detail on the effects of the proposed activity on: sites of historic or cultural significance, surface water and groundwater quality, flora and fauna of cultural significance, areas of historical or spiritual importance, areas of significant landscape value, and waterways and wetlands.

No discharges to surface water or direct to ground water.

7.3.13 Please provide details on the steps that you will take to ensure effects on Ngāi Tahu values are avoided, mitigated or remedied Appropriate treatment system installed.

**Other**

7.11.14 Will you provide a copy of the resource consent to any person exercising your consent and explain to them how to comply with the conditions of the consent?  Yes  No

7.11.15 Will you notify Environment Canterbury at least two days before starting works?  Yes  No

7.11.16 If you answered "No" to any of the questions above, please explain why.

7.11.17 Is the site an historical site?  Yes  No

*If yes, please contact Heritage New Zealand Pouhere Taonga.*

*Please note that under the Historic Places Act 1993 an archaeological site is defined as any place associated with pre-1900 human activity, where there is material evidence relating to the history of New Zealand. For sites solely of Māori origin, this evidence may be in the form of accumulations of shell, bone, charcoal, burnt stones, etc. In later sites, artefacts such as bottles or broken glass, ceramics, metals, etc, may be found or evidence of old foundations, wells, drains, tailings, races or other structures. Human remains/koiwi may date to any historic period.*

*It is unlawful for any person to destroy, damage, or modify the whole or any part of an archaeological site without the prior authority of the Heritage New Zealand. This is the case regardless of the legal status of the land on which the site is located, whether the activity is permitted under the District or Regional Plan or whether a resource or building consent has been granted. The Historic Places Act provides for substantial penalties for unauthorised damage or destruction.*

**7.12 Adverse effects of the discharge on amenity values**

7.12.1 Are there any dwellings (except your own dwelling) or any places where people gather within 30 metres of the vents of your land application system?  Yes  No

7.12.2 **If yes**, please specify the distance from the closest dwelling to any vents:

7.12.3 What effect will your discharge have on amenity values? Why?

**7.13 Other effects applicable to this site**

7.13.1 Please provide an assessment of any other effects that may be relevant:  
*(e.g. this may include an assessment on the effects of chlorine on the environment if you have proposed to treat the wastewater with chlorine)*

**8 ADDITIONAL MITIGATION MEASURES**

**8.1 Please provide details of any mitigation measures proposed that have not been included elsewhere in this application:**

**9 CONSIDERATION OF ALTERNATIVES**

**9.1 Please provide an assessment of:**

- (a) the nature of the discharge and the sensitivity of the receiving environment to adverse effects; and
- (b) the applicant’s reasons for the proposed choice; and
- (c) any possible alternative methods of discharge including discharge into any other environment.

Please explain which alternative locations or treatment options were considered and why they were rejected:

Refer attached Technical Report 14

*Note: This information is required under Section 105 of the Resource Management Act. If you don't complete this section your application will be returned to you as incomplete.*

**10 OTHER INFORMATION**

**10.1 Notification**

If your assessment of effects has shown that adverse effects on the environment are likely to be more than minor and/or there are people who may be adversely affected from whom you are unable to obtain written approval, you may wish to request that your application be publicly notified or limited notified in order to avoid possible delays in the processing of your application.

The final decision to notify or not notify an application will still be made by Environment Canterbury.

Please note that an application cannot be notified unless there is sufficient information for the notice to make it clear what is being applied for, and how it might affect the environment (including people).

10.1.1 I request that my application is notified.  Yes  No

**10.2 Duration requested**

10.2.1 Please specify the duration sought for your consent(s): 35 years months.

*Note: The maximum duration allowed under the Act is 35 years.*

**10.3 Start date**

*Note: Resource consents lapse five years after their commencement date unless the consent has been given effect to or an application is made to Environment Canterbury to extend this period.*

10.3.1 When do you propose to start the activity? 2024 (date/month/year)

**10.4 Additional notes to applicants**

- Your application must be publicly notified unless Environment Canterbury is satisfied that the adverse effects on the environment will be minor and written approval has been obtained from every person Environment Canterbury considers may be adversely affected by the granting of your application (unless Environment Canterbury considers it unreasonable to require the obtaining of every such approval).
- Section 128 of the Resource Management Act 1991 sets out the circumstances in which Environment Canterbury may review the conditions of a resource consent. Under Section 128(c) Environment Canterbury may undertake a review at any time if the application contained any inaccuracies which materially influenced the decision made.
- **The information you provide with your application, which includes all associated reports and attachments, is official information. It will be used to process your application and, together with other official information, assist in the management of the region’s natural and physical resources. Access to information held by**



Environment Canterbury is administered in accordance with the Local Government Official Information and Meetings Act 1987, and Privacy Act 1993. Your information may be disclosed in accordance with the terms of these Acts. Public access is also provided to consent information via Environment Canterbury’s website. *Environment Canterbury may withhold access to information in certain circumstances. It is therefore important you advise Environment Canterbury about any concern you may have about disclosure of any of the information, which includes all associated reports and attachments, you have provided in this application (e.g. protection of personal information, trade secrets, commercially sensitive material, information which, if released, may cause serious offence to tikanga Maori, or any other information you consider should not be disclosed. While Environment Canterbury may still have to disclose information under the above legislation, it can take into account any concern you wish to raise.*

Please describe any concerns here:

**10.5 Errors and omissions**

10.5.1 When you receive your Resource Consent Documents please check that the details are correct. You have a 15 working day period after the decision is notified to allow you to object or advise of errors or omissions without cost.

**11 APPLICANT SIGNATURE AND DATE**

I/we **have read** all of the information on this application form and I understand all of the notes and I understand that I am liable to pay all actual and reasonable charges relating to the processing of this application.

I/we **also understand** that if the application is granted, I will be liable to pay all actual and reasonable charges related to compliance monitoring of the consent.

Signature of **applicant**

**or Duly Authorised Person**

Date 27 July 2022

Full name of person signing – please print

Paul Duder

Signature of **applicant**

**or Duly Authorised Person**

Date

Full name of person signing – please print



**Note: Environment Canterbury must have written authorisation to process your consent application. Both the consultant (if used) and the applicant must sign this section.**

- Where there are multiple people applying for consent, all persons must sign this form.
- If a company is the applicant, at least one director must sign this form.
- Anyone else who is applying for consent on behalf of another person, group of people or a company (e.g. a manager applying on behalf of a company) can sign this form and submit the application. However, written authorisation from the persons or company on behalf of which the consent is being applied for must be supplied with this application.

**12 CONSULTANT SIGNATURE AND DATE**



Signature of **consultant**

27 July 2022

Date

Paul Duder

Full name of person signing – please print

**CHECKLIST**

Please ensure you:

- Complete all parts of this application form.
- Include an assessment of effects of the activity on the environment, set out in Section 7 of this application form.
- Include a site plan.
- Include a copy of the certificate of title, rates demand, subdivision plan or valuation notice for the site your application relates to.
- Sign and date this application form (both applicant and consultant if one is used).
- Include the appropriate charge as set out in the “Summary of Resource Consent charges”.

Consider consulting local Rūnanga:

- If your proposed activity occurs:
  - (a) Within a statutory acknowledgement area
  - (b) Within a silent file area
  - (c) Close to a site of cultural significance, or
  - (d) Otherwise affects a site of cultural significance.

### 13 LOCATION PLAN

Please complete this plan showing the site with the location of the proposed activity and indicate any relevant identifying features such as buildings, roads, rivers, etc or other relevant details, or alternatively, attach a plan or map to this consent application.

