

Before Commissioner Allan Cubitt  
Via Zoom digital link

7 April 2022  
9.00 am

## Staff Report for Hearing

*The recommendation in the staff report represents the opinion of the writer and it is not binding on the Hearing Commissioner. The report is evidence and has no greater weight than any other evidence that the Commissioner will hear and consider.*

### Hearing of Application – APP-20211092

#### Titipua Limited Partnership

Compiled by Jade McRae, Senior Consents Officer

**Applicant:** Titipua Limited Partnership

**Application Number:** APP-20211092

**Location:** 354 Hedgehope Block Road, Hedgehope

**Activities for Consent:** See Table 1 (below). A consent term of 10 years is sought for all consents.

**Notification:** The application was limited notified on 10 December 2021.

**Table 1: Consents Sought**

Consent Type	Purpose
1. Discharge Permit	To discharge agricultural effluent to land from up to 600 cows
2. Water Permit	To take and use 72,000L/day of groundwater
3. Land Use Consent	To use land for a winter barn (herd home)
	To use land for a feed pad
4. Land Use Consent	To use land for farming in the form of a dairy farm expansion
5. Land Use Consent	To use land for a new effluent storage facility in the form of a herd home bunker

## **1. Introduction**

### **1.1 Status and purpose of this report**

1.1.1 This report has been prepared under Section 42A of the Resource Management Act 1991 (RMA or Act) to assist the Hearing Commissioner in the hearing of the application for resource consent made by Titipua Limited Partnership. Section 42A allows local authorities to require the preparation of such a report on an application for resource consent and allows the report to be considered at any hearing conducted by the local authority.

1.1.2 In accordance with s42A (1A) and (1B), material contained within the application documentation is largely referenced rather than repeated where it is efficient to do so.

1.1.3 The purpose of the report is to assist the Hearing Commissioner in making a decision on the application.

### **1.2 About the author**

1.2.1 My name is Jade Linda McRae. I am a Senior Consents Officer employed by the Southland Regional Council. I have been employed by the Council firstly as a Consents Officer, and now Senior Consents Officer, since January 2019.

1.2.2 I hold the qualifications of Bachelor of Science majoring in Zoology and Psychology and a Certificate in Sustainable Nutrient Management in New Zealand Agriculture (intermediate Overseer). I am an accredited decision-maker through the Ministry for the Environment Making Good Decisions course and an Associate member of the New Zealand Planning Institute.

1.2.3 I have been involved with the application since it was lodged and received by Council. I have also visited the site on 24 February 2021 during a pre-application meeting.

1.2.4 For completeness, I have read the Environment Court of New Zealand Practice Note 2014 Code of Conduct for expert witnesses and agree to abide by it.

### **1.3 Information relied on in preparation of this report**

1.3.1 In preparation of this report I have had regard to the following documents:

- resource consent application;
- additional application for a discharge permit and water take;
- additional application for a herd home and associated effluent storage;
- further information requested under Section 92(1) of the RMA;
- report commissioned under Section 92(2) of the RMA;
- the submissions on the application;
- relevant statutory instruments including:
  - Resource Management Act 1991 (RMA or Act);
  - National Environmental Standards for Freshwater Regulations 2020 (NES-F);
  - National Environmental Standards for Sources of Human Drinking Water Regulations 2007 (NES-SHDW);
  - National Policy Statement on Freshwater Management 2020 (NPS-FM);
  - Southland Regional Policy Statement 2017 (RPS);

- Regional Water Plan for Southland, 2010 (RWPS);
- Proposed Southland Water and Land Plan, 3 April 2018 (Decisions Version – with Appeals) (PSWLP);
- Environment Court Decisions on the Proposed Southland Water and Land Plan;
- Te Tangi a Tauria (Iwi Management Plan) 2008.

## 1.4 Attachments

1.4.1 The following attachments form part of this report:

- Attachment 1: Irricon Resource Solutions OVERSEER Nutrient Budget Review Report on behalf of Council
- Attachment 2: s92(1) Further information response
- Attachment 3: Forest and Bird submission
- Attachment 4: Te Ao Marama Inc submission
- Attachment 5: Mo Topham’s File Note: Updating Overseer FM outputs to version 6.4.2 on behalf of the applicant
- Attachment 6: Draft consent conditions

## 2. The application and procedural matters

### 2.1 The proposed activities

2.1.1 Consents have been sought as follows:

Applicant: Titipua Limited Partnership

Application Number: APP-20211092

Activities for consent is sought:

**Discharge Application:**

To discharge agricultural effluent to land from up to 600 cows via low rate travelling irrigator, slurry tanker or umbilical system onto 88 ha.

**Water Take Application:**

To take and use 72 m<sup>3</sup>/day of groundwater for stock drinking and dairy shed wash down.

**Land use Application:**

To use land for a herd home.

**Land use Application:**

To use land for a feed pad.

**Land use Application:**

To use land for farming in the form of a dairy farm expansion.

**Land use Application:**

To use land for a new effluent storage facility.

**2.2 Summary of the Proposal**

2.2.1 The proposed activities are outlined in the submitted applications. However, by way of brief summary, the applicant is proposing to renew its current discharge and water permits (AUTH-301081-V1 and AUTH-301082-V1), which both expire on 1 September 2022, as well as expand the dairy farm by increasing the peak milking herd to the currently consented threshold of 600 cows and to incorporating 84.2 ha of sheep farming land into the dairy platform. It also requires land use consents for an existing 1,300 m<sup>2</sup> feed pad, which can accommodate up to 120 cows, a proposed herd home that can accommodate up to 200 cows during winter and up to 490 cows at other times of the year, and a new effluent storage facility in the form of a herd home bunker.



**Figure 1:** Details the proposed location of the new herd home winter barn and associated effluent storage bunker (grey rectangle to the west) in relation to the current dairy milking shed, feed pad and effluent system.

## 2.3 Regional Planning Framework

- 2.3.1 Resource consents for the above activities are required under the National Environmental Standards for Freshwater, the Regional Water Plan (RWP) and the proposed Southland Water and Land Plan (pSWLP).
- 2.3.2 An application for resource consents was lodged with Environment Southland in accordance with these requirements.
- 2.3.3 I generally concur with these assessments and summarise these as follows in Table 2 below. I note that the rules in the Proposed Plan (PP in the table below), which are subject to appeal, are greyed out.

**Table 2: Activity Status of Consents Sought**

Activity	Relevant Rule	Activity Status
To discharge dairy shed from up to 600 cows and feed pad effluent from up to 120 cows to land low rate travelling irrigator, umbilical system and slurry tanker.	OP: Rule 50: Discharges of dairy farm effluent to land	Discretionary activity
	PP: Rule 35: Discharge of agricultural effluent to land	Restricted Discretionary activity
To take and use 72,000 L per day of groundwater for the purpose of stock drinking and dairy shed wash down.	OP: Rule 23: Abstraction and use of groundwater	Discretionary activity
	PP: Rule 54: Abstraction and use of groundwater	Permitted activity
To use land for a 1,300 m <sup>2</sup> wood material base feed pad which accommodates up to 120 cows.	NES: Regulation 11: Feedlots	Non-complying activity
	PP: Rule 35A: The use of land for Feed pads/lots	Permitted activity
To use land for a 720 m <sup>2</sup> herd home winter barn for up to 200 cows in winter and 490 cows at other times of the year.	NES: N/A	
	PP: Rule 35A: The use of land for Feed pads/lots	Discretionary activity
To use land for a new agricultural effluent storage facility in the form of a herd home bunker.	OP: N/A	
	PP: Rule 32B: Construction, maintenance and use of new agricultural effluent storage facilities	Non-complying activity
To use land for farming in the form of a dairy farm expansion.	NES: Regulation 19: Conversion of land on farm to dairy farm land	Discretionary activity

Activity	Relevant Rule	Activity Status
	PP: Rule 20: The use of land for a farming activity	Discretionary activity

2.3.4 As the applications are bundled, the overall activity status is a **non-complying activity**.

2.3.5 When considering a **non-complying activity**, the Council may only, in accordance with Section 104D, grant a resource consent for the activity if it is satisfied that the adverse effects of the activity are minor or the application is for an activity that will not be contrary to the objectives and policies of the relevant plan or proposed plan. If the application passes one or both of the “gateway” tests in Section 104D, then under Section 104B the Council may grant or refuse consent for a non-complying activity, and if it grants the application, may impose conditions under Section 108 of the RMA.

## 2.4 Further information request

2.4.1 Pursuant to Section 92(2) of the RMA, a request to commission an audit of, and report on, the Overseer nutrient budgets was sent to the applicant on 17 May 2021.

2.4.2 The applicant agreed to the commissioning of the report on 17 May 2021.

2.4.3 The report was received 2 June 2021 for the purpose of s92(2) is the OVERSEER Nutrient Budget Review report authored by Nicky Watt from Irricon Resource Solutions and is attached.

2.4.4 Further information was requested from the applicant on 9 June 2021. The requested information included:

- (a) a visual inspection of the sludge beds and weeping wall when they are as empty as reasonably practicable by a Suitably Qualified Person. I am requesting this information to ensure that the sludge beds have no cracks, holes or defects that would allow effluent to leak from the facility and are therefore a permitted activity under Rule 32D of the pSWLP;
- (b) confirmation that the pond has a leak detection system that underlies the entire facility. If the pond does not have a leak detection system that underlies the entire facility, then please provide Pond drop test results for the effluent storage pond. I am requesting this information to ensure the pond is a permitted activity under Rule 32D of the pSWLP;
- (c) a Dairy Effluent Storage Calculation (DESC) modelled in the latest version. I am requesting this information to ensure the effluent storage pond is adequately sized to prevent the discharge of effluent when the soil conditions are not appropriate;
- (d) an application depth and rate test for the travelling irrigator. I am requesting this information to confirm the “low rate Cobra” travelling irrigator is applying effluent as proposed;
- (e) confirmation all waterways on both the dairy platform and the new Schrama block are fenced with a 3 metre setback to exclude all stock from accessing the waterways. I am requesting this information to ensure the new pastoral system is a permitted activity

under Regulation 9 and Regulation 11 of the Resource Management (Stock Exclusion) Regulations 2020;

- (f) confirmation the feed pad is a non-complying activity under the National Environmental Standards for Freshwater Management 2020, as it cannot comply with Regulation 10(3)(a);
- (g) confirmation that 12 ha is the largest area per year of crop the applicants will use during the life of the land use consent for farming/expanded dairy farm;
- (h) an assessment against Policy 4 of the National Policy Statement for Freshwater with regard to the increase in GHG emissions from 11,529/ha for the current scenario to 12,300/ha for the proposed scenario;
- (i) confirmation a variation application will be submitted to Council to include the discharge of feed pad effluent in discharge permit AUTH-301081-V1. I am requesting this information as currently the discharge of feed pad effluent is unlawfully occurring;
- (j) address the concerns regarding the Proposed model raised by the Nutrient Budget auditor in the attached review. I am requesting this information because inputting accurate information into the nutrient budgets will change the predicted nutrient losses to water.

2.4.5 The above information was provided by the applicant (attached) on 30 August 2021.

## 2.5 Notification and Submissions

2.5.1 The application was publicly notified on 10 December 2021.

2.5.2 Two submissions were received. These are included in the appendices, and are summarised as follows:

**Table 3: Summary of Submissions**

Submitter	Oppose/Support	Issues/comments	Decision Sought
Te Ao Marama Inc.	Oppose	Effects on cultural values, rights and interests. Intensification of land. Proposed mitigation measures do not adequately mitigate the effects on water quality.	Decline the application.
Forest and Bird	Oppose	Inadequate mitigation measures. No consideration of climate change. Inconsistent with the Act, NPS-FM, RPS and pSWLP.	Decline the application.

2.5.3 Both submitters indicated that they wish to be heard at the hearing.

## 2.6 Section 99 pre-hearing meeting

2.6.1 No pre-hearing meeting was held for the application, as the applicant did not see any benefit in one as both submitters oppose the proposal.

### **3. Assessment**

#### **3.1 Statutory Considerations**

3.1.1 Section 104 of the Act sets out the matters to be considered when assessing an application for a resource consent. Section 104(1) of the Resource Management Act, 1991, states:

- (1) *When considering an application for a resource consent and any submission received, the consent authority must, subject to Part 2, have regard to:*
- (a) *any actual and potential effects on the environment of allowing the activity; and*
  - (b) *any relevant provisions of:*
    - (i) *a national environmental standard;*
    - (ii) *other regulations;*
    - (iii) *a national policy statement;*
    - (v) *a regional or proposed regional policy statement;*
    - (vi) *a plan or proposed plan; and*
  - (c) *any other matter the consent authority considers relevant and reasonably necessary to determine the application.*

3.1.2 Those matters which are relevant for this application are discussed in the following sections as follows:

- description of the receiving environment;
- assessment of the actual and potential effect of the activity on the environment;
- relevant provisions of the Regional Water Plan and the Proposed Southland Water and Land Plan;
- relevant provisions of the Southland Regional Policy Statement;
- relevant provisions of the National Policy Statements and National Environmental Standards;
- Part 2 of the RMA.

3.1.3 Section 108 provides for consent to be granted subject to conditions and sets out the kind of conditions that may be imposed.

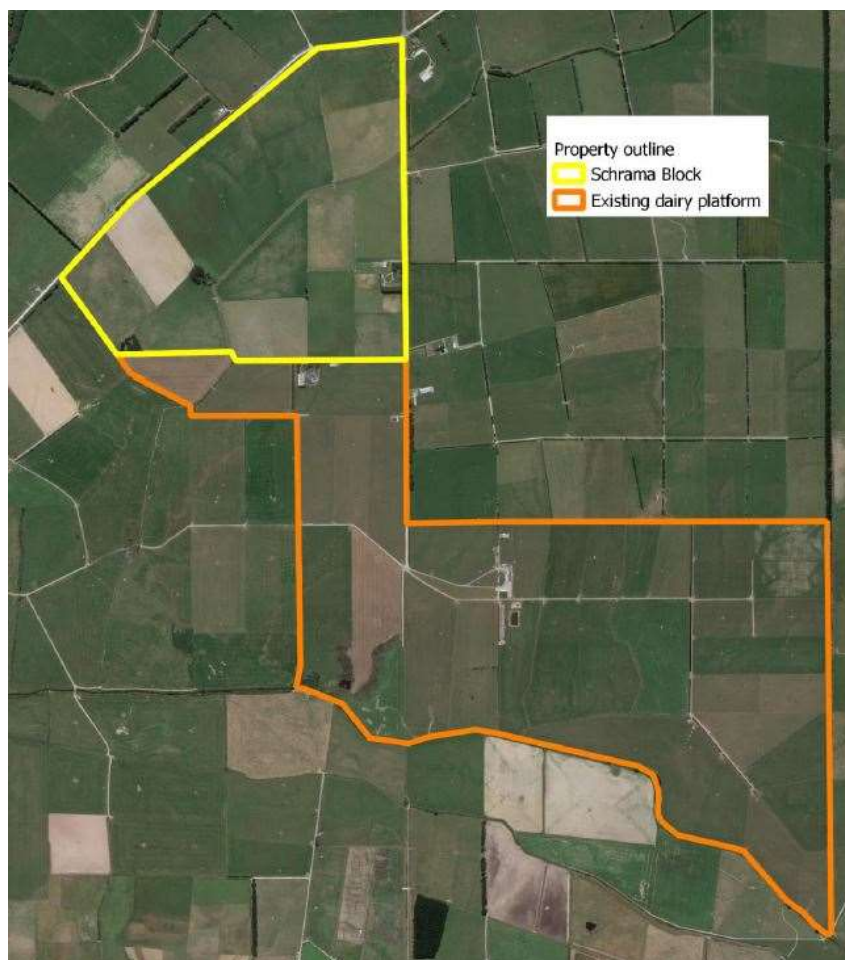
#### **3.2 Description of the affected environment**

3.2.1 The existing site is an operational dairy farm located approximately 23 km north east of Invercargill township. Currently, the applicant holds discharge permit AUTH-301081-V1 and water permit AUTH-301082-V1. The discharge permit authorises the discharge of dairy shed effluent from 600 cows onto 88 ha via low rate rain gun. The water permit authorises the abstraction of 72,000 L/day of groundwater. The property is located within the Titipua Stream catchment, which is part of the wider Oreti FMU.

3.2.2 The applicant recently purchased 84.2 ha of neighbouring property known as the Schrama block. This parcel of land has been historically sheep farmed and has never been included in a dairy platform. Since the purchase the applicant has been using this block of land for growing winter crop, which was undertaken by the previous owner in the reference period stipulated in the National Environmental Standards for Freshwater 2020 (NES-F). I undertook a pre-application site visit on 24 February 2021 before the application was lodged on 11 May 2021. At that time



the Schrama block did have 5.8 ha of crop growing on it and a new dairy lane had been constructed but not fenced and there were no cows present on the block.



**Figure 2:** Taken from the application showing the existing dairy platform in orange and the newly purchased sheep farm (Schrama block) in yellow.

3.2.3 Soils and Physiographic Zones within the property are detailed in Table 4 below.

**Table 4: Soil and Physiographic Zones with the Property**

Soils	Soil Type	Vulnerability Factors		
		Structural Compaction	Nutrient Leaching	Waterlogging
	Pukemutu	Severe	Slight	Severe
	Makarewa	Moderate	Slight	Severe
	Arthurton	Minimal	Slight	Severe
<b>FDE land classification</b>	Category A – Artificial drainage Category C – Sloping land			
<b>Physiographic Zones</b>	Lignite/Marine Terraces (72%) Peat Wetlands (27%) Gleyed (1%)			

- 3.2.4 Soils in the Lignite/Marine Terraces Physiographic zone have high denitrifying potential in areas close to organic carbon sediments. The main risk in this zone is to the surface water due to contaminant movement via overland and/or artificial drainage during heavy rainfall events. Some water will drain to underlying aquifers, however, they tend to have long “residence times” (slow movement of groundwater through the aquifer).
- 3.2.5 Much of the Peat Wetlands physiographic zone was wetland before being developed and has extremely acidic soils which are prone to waterlogging. A key feature of this zone is the highly fluctuating water table, which can extend up to the land surface during wet winter months. When the water table is high, streams are at risk of receiving high levels of contaminants via overland flow. When the water table is lower, streams receive contaminants via the extensive artificial drainage system. The soils also have a high denitrification potential and so nitrogen build-up is not an issue for aquifers in this zone. However, a lack of silt and clay and the highly acidic property of peat soils mean that phosphorus is poorly retained and easily leached to water.
- 3.2.6 Soils in the Gleyed physiographic zone are poorly drained and prone to water logging. The soils may accumulate and store nitrogen during summer and early autumn months when soil moisture levels are low. This accumulated nitrogen starts moving with water when soils become wet in late autumn and winter and may be lost via artificial drains or overland flow. However, some nitrogen will be removed from the soil and aquifers via denitrification, resulting in relatively low groundwater nitrate concentrations.
- 3.2.7 *Groundwater quality* - there is one groundwater monitoring bore on the property, E46/1068, which showed Minor to Moderate land use impacts (1.0–3.5 mg/L) when it was tested once only in January 2011. There are seven monitoring bores located between 5.5 km-8 km down gradient, which show a range of results from Pristine, pre-European (0.01–0.4 mg/L) to Exceeding NZDWS (>11.3 mg/L). Four of these bores have been tested three times or less and have not been tested within the last five years. Bore E46/0994 (18 m deep) located 6.6 km down gradient was tested 14 times between 2010 and 2016 with groundwater nitrate levels ranging between 1.21 mg/L and 4.4 mg/L. Bore E46/0888 (51 m deep) located 5.5 km down gradient was tested 15 times between 2009 and 2018 with groundwater nitrate levels ranging between 7.3 mg/L and 10 mg/L. Bore E46/0895 (8.5 m deep) located 7 km down gradient was tested 19 times between 2009 and 2017, with results ranging between 12.3 mg/L and 34 mg/L, which is more than triple the maximum level identified as the New Zealand Drinking Water standard. The two latter bores are both located in the Oxidising physiographic zone, which could be contributing to the elevated nitrate levels.
- 3.2.8 *Surface water quality* - the surface water quality within the catchment is degraded, in particular the Hedgehope Stream 20 m upstream of the Makarewa River confluence sits in the worst 25% of all sites for *E.coli* and in the worst 50% of all sites for Total Nitrogen and Total Phosphorus<sup>1</sup>.

<sup>1</sup> <https://www.lawa.org.nz/explore-data/southland-region/river-quality/oreti-river/hedgehope-stream-20m-us-makarewa-conf/>

### 3.3 Actual and potential effects

#### 3.3.1 Effects that must be disregarded (Section 104(2))

3.3.1.1 Policy 39 of the proposed Southland Water and Land Plan states:

*“When considering any application for resource consent for the use of land for a farming activity, the Southland Regional Council should consider all adverse effects of the proposed activity on water quality, whether or not this Plan permits an activity with that effect”.*

As such, **all effects** related to the use of land for farming and the associated activities undertaken as part of the entire farming operation have been considered, and **no effects have been disregarded**.

#### 3.3.2 Effects to be considered (Section 104(1)(a))

##### 3.3.2.1 Water Quality

###### Discharge

Potential adverse effects of discharging effluent onto land include contamination of groundwater and contamination of surface waterways. The applicant has proposed good management practices that will be adopted to minimise adverse effects arising from the activity:

- storage of effluent in the effluent pond when conditions are not suitable for discharge;
- adhering to buffer distances from surface waterways and bores;
- application of effluent at low rates and depths; and
- use of a slurry tanker and umbilical system as required.

###### Land Use – Expanded dairy farm

The applicant has provided nutrient budgets of the current scenarios and proposed amalgamated scenario as required by Part B section 4 of Appendix N in the proposed Southland Water and Land plan. These budgets have been created by Mo Topham, who is a Certified Nutrient Management Advisor, using the Overseer Software. Council commissioned Nicky Watt, who is a Certified Nutrient Management Advisor, to review the nutrient budgets for a “sensitivity check”. She has confirmed that the figures that have been used in the budgets are appropriate and that the Overseer Best Practice Data Input Standards have been followed.

Table 5 below shows the nutrient losses from the dairy platform and the Schrama block as individual current scenarios. It is noted in the application that the inputs used for the Schrama block have been based off information available from Beef and Lamb NZ Economic survey<sup>2</sup> and are not actual farm specific inputs, due to a lack of detailed information and records from the previous owner. Losses from both the dairy platform and the Schrama block were then added together to provide a relative comparison to the proposed scenario (Schrama block included as dairy platform). There have been multiple version changes within Overseer occur and new nutrient budgets created to cater for the proposed herd home winter barn since the application was notified, resulting in the changes shown in red.

<sup>2</sup> <https://beeflambnz.com/sites/default/files/data/files/2019%20SSI.pdf>

**Table 5: Nutrient losses from the dairy platform and the Schrama block**

	Dairy platform current	Schrama block current	Dairy + Schrama current	Proposed scenario	Difference (%)
N Loss to water (kg/ha/yr)	56	20	45 44	44 40	-2.2% -9.0%
N Loss to water (kg/yr)	<del>10,196</del> 10,151	<del>1,685</del> 1,658	<del>11,881</del> 11,809	<del>11,656</del> 10,647	-1.9% -9.8%
P Loss to water (kg/ha/yr)	2.5	2.3	2.4	2.3	-4.2%
P Loss to water (kg/yr)	456 458	191	647 649	617 623	-4.6% -4.0%

Table 6 below outlines the good management practices (GMPs) and mitigation measures which have either occurred or are proposed to be undertaken on-farm. Each GMP/mitigation has a varying degree of effectiveness in terms of nitrogen, phosphorus, microbes (e.g. *E. coli*) and sediment loss. The mitigation measures and GMPs for the landholding have been selected based on specific characteristics of the physiographic zones and key contaminant pathways present.

**Table 6: Good Management Practices (GMPs) and mitigation measures which have either occurred or are proposed to be undertaken on-farm**

Mitigation/GMP	Implementation timeframe	Mitigation measure or GMP?
Fence off all waterways	Done	Good management practice
Plant all riparian margins	Ongoing – riparian margin between new land and waterway to be planted	Good management practice
Building a new herd home winter barn to winter 200 cows and feed up to 400 cows during other times of the year	From first exercise of new consent	<b>Mitigation measure</b>
Provide sufficient effluent storage to enable deferred application	Done	Good management practice
Defer effluent application when soil conditions are unsuitable	Currently happens	Good management practice
Minimising run-off from tracks, gateways, and crossings by ensuring they are designed and maintained adequately	From first exercise of new consent for Schrama block	Good management practice
Construct/enhance wetland	From first exercise of new consent	<b>Mitigation measure</b>
Ecotain plantain seeds used in re-grassing programme	Has been occurring for the past four years	<b>Mitigation measure</b>
Apply effluent at low rates and depths	Low rate rain gun used	Good management practice

Mitigation/GMP	Implementation timeframe	Mitigation measure or GMP?
Reducing winter crop area below the permitted baseline of 17.7 ha to 10 ha	From first exercise of new consent	<b>Mitigation measure</b>
Re-sow bare soils as soon as possible	Currently happens	Good management practice
Back fence stock off land that has already been grazed	Currently happens	Good management practice
Use portable water troughs and portable feeders when baleage is fed on crop paddocks.	Currently happens	Good management practice
Mob sizes less than 120 cattle when intensively winter grazing	Currently happens	Good management practice
CSAs are identified and protected	Currently happens	Good management practice
Avoid applying fertiliser to excessively dry, saturated or when soil temp is less than 7 degrees	Currently happens	Good management practice
Reducing Olsen P levels from 34/35 to 30	From first exercise of new consent	Good management practice

Table 6 above shows which measures are identified as mitigations and which are GMPs. Overseer assumes that GMPs are being used, which means some of the GMPs are already accounted for in Overseer. Others are not accounted for in Overseer and are therefore not taken into account by the budget, and so they can be considered a mitigation as they represent something additional that the applicant is putting in place to mitigate the effects.

In light of the Government’s Science Advisory Panel’s review of the effectiveness of Overseer in assessing and predicting farm-scale nitrogen losses, and the conclusion that the current Overseer model is not fully fit for purpose in the way it is being currently used in the consenting process, mitigation measures are of the utmost importance when assessing this application. This is because they represent additional steps that can be taken to offset or compensate for the effects of the change or intensification of land use. Those crucial mitigations are:

- wetland enhancement;
- reducing the area of crop below the permitted threshold of 17.7 ha to 10 ha;
- plantain used in the re-grassing programme;
- 200 cows wintered in a herd home winter barn.



**Figure 3:** Taken from the application showing the proposed wetland enhancement and the contributing catchment outlined in green.

### Nitrogen

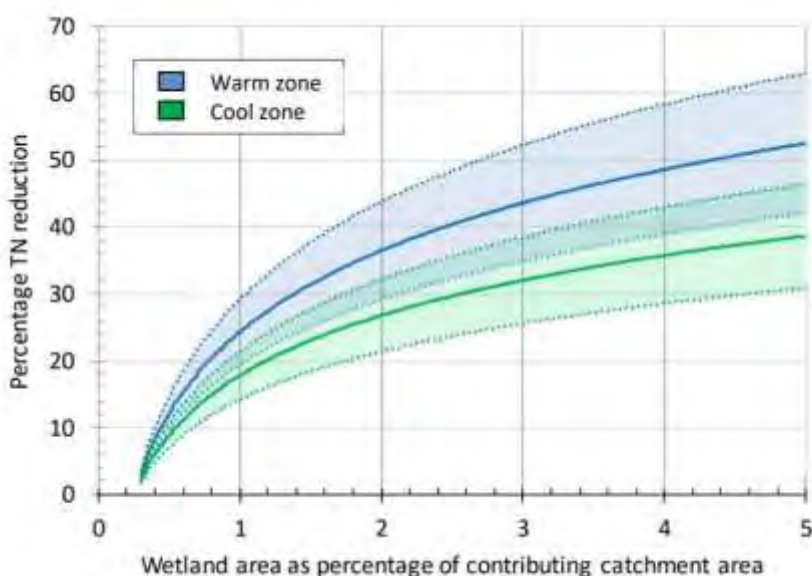
The budgets show that the N losses on the landholding are expected to decrease by 1,162 kg/year or -9.8% when the Schrama block is amalgamated into the platform and the proposed herd home winter barn constructed in comparison with the current scenarios combined. However, the application includes calculations done outside of Overseer to account for wintering on grass and baleage and the enhancement of the duck pond into a constructed wetland. These calculations were undertaken by Mo Topham, as Overseer cannot model them and they detail why N losses are expected to be lower than those modelled.

The latest version of Overseer (6.4.2) has estimated that the loss of nitrogen from the grass baleage wintering system is 566 kgN (or 56 kgN/ha). Ms Topham notes in her “File Note: Updating OverseerFM outputs to version 6.4.2” ([attached](#)) that Overseer has most likely underestimated the nitrogen losses from the grass and baleage wintering system, as it is not able to adequately reflect what is actually happening on-farm. Overseer assumes that the pasture plants will regrow post grazing and take up urinary N from the winter grazing activity. However, due to the soil type and climate on the applicant’s property, the plants are not viable following the winter grazing (also known as a sacrifice paddock) and will be cultivated/re-grassed in spring. Wintering cows in paddocks can cause compaction of soil, which reduces soil porosity and hydraulic conductivity and increases bulk density, particularly on fine textured soils which have become water-saturated (Luo & Ledgard, 2021)<sup>3</sup>. Fallow soil can run off into surface waterbodies carrying with it phosphorus and microbial contaminants. As a result of the

<sup>3</sup> Luo, J. and Ledgard, S. (2021) New Zealand Dairy Farm Systems and Key Environmental Effects. *Frontiers of Agricultural Science and Engineering*, Vol 8, issue 1, pages 148–158

calculation done outside of Overseer by Ms Topham, the applicant predicts that the losses from the grass and baleage wintering system will be 603 kgN higher than estimated in the Overseer proposed scenario.

The existing duck pond in the south western section of the landholding is proposed to be upgraded to a 2.2ha wetland and will have a contributing catchment of 44ha. NIWA’s Constructed Wetland Guidelines<sup>4</sup> state to function effectively the constructed wetland needs to comprise between 1%-5% of its contributing catchment. The applicant’s proposed wetland will equate to 5% of the contributing catchment. A constructed wetland of that size in a region considered a “cold zone” (median annual air temperature of 8-12 degrees) can remove between 30%–44% of long-term total nitrogen inputs (Tanner et al., 2020)<sup>5</sup>. The application includes calculations based on the constructed wetland removing 38% of long-term total nitrogen inputs. This can be seen in Figure 4 below.



**Figure 4:** Long-term median annual Total Nitrogen (TN) reduction performance expectations for warm (median annual temperature >12°C) and cool (median annual temperature 8-12°C) climatic zones. The solid lines show expected medians for each zone; shaded areas show inter-annual and inter-site range of performance expected.

As a result, the calculations of N reduction within Ms Topham’s File Note shown in Figure 5 below accurately reflect that the constructed wetland could potentially remove an additional **460.5 kg/year** of total nitrogen from the 34 ha of the contributing catchment within the landholding at a median reduction rate of 38%. Additionally, using the 30%–44% reduction range results in anywhere between 364-533 kg/year of N being potentially removed by the wetland mitigation.

<sup>4</sup> <https://niwa.co.nz/sites/niwa.co.nz/files/Summary%20of%20Constructed%20Wetland%20Guidelines%202020%20v2.pdf>

<sup>5</sup> Tanner, C.C., Sukias, J.P.S. and Woodward, B. (2020) Provisional guidelines for constructed wetland treatment of pastoral farm run-off. NIWA Client Report to DairyNZ, January 2020.

Overseer block name	Area of block captured by wetland (ha)	OverseerFM estimated nitrogen leaching loss (version 6.4.1) (version 6.4.2 in red) (kgN/ha)	Reduction in N leaching due to wetland (estimated from wetland resource) (%)	Total reduction (Ha x kgN/ha x %) (kgN) (version 6.4.1) (version 6.4.2 in red)
Non-Eff, Rolling – Puke, Apar	21.4	39.4 38	38	320.4 309.0
Eff, Rolling – Puke, Apar	9.1	36.0 35	38	124.5 121.0
Non effective area (laneways and tracks) – the losses from this area are accounted for in “other sources” below.	3.5			
<b>Total block Nitrogen loss mitigated</b>	<b>34.0</b>			<b>444.9</b> <b>430.0</b>
Plus reduction in other sources losses	34/265.7	637 627	38	31.0 30.5
<b>Total farm Nitrogen loss mitigated</b>				<b>475.9</b> <b>460.5</b>

**Figure 5:** Taken from the “File Note: Updating OverseerFM outputs to version 6.4.2” authored by Mo Topham showing Total Nitrogen removed by the constructed wetland at the 38% reduction rate. A version change from 6.4.1 to 6.4.2 within Overseer occurred resulting in changes shown in red.

### Phosphorus

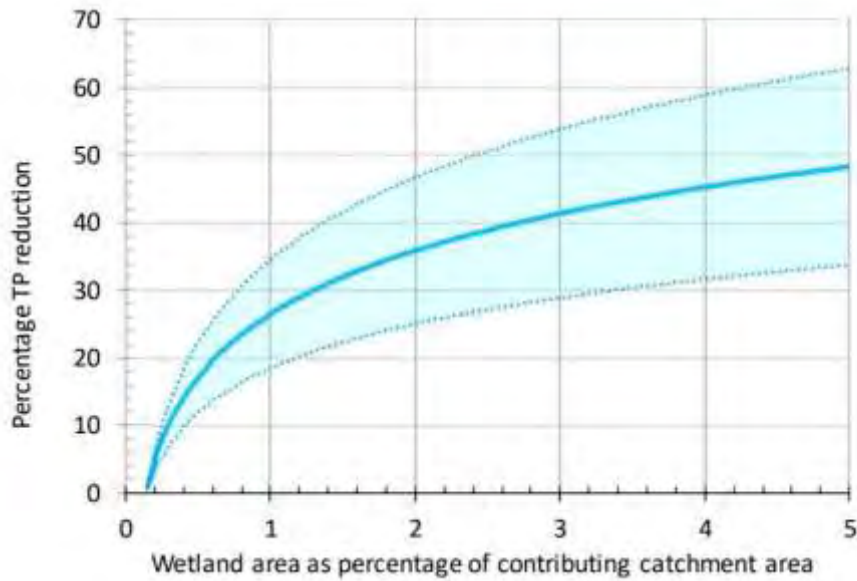
The budgets show that the P losses on the landholding are expected to decrease by 26 kg/year or -4.0% when the Schrama block is amalgamated into the platform and the proposed herd home winter barn constructed in comparison with the current scenarios combined. However, the application includes calculations done outside of Overseer to account for wintering on grass and baleage and the enhancement of the duck pond into a constructed wetland. These calculations were undertaken by Ms Topham as Overseer cannot model them and they detail why P losses are expected to be lower than those modelled.

The latest version of Overseer (6.4.2) has estimated that the loss of phosphorus from the grass baleage wintering system is 19kgP. As a result of the calculation done outside of Overseer by Ms Topham, the applicant predicts that the losses from the grass and baleage wintering system will be **5kgP lower** than estimated in the Overseer proposed scenario.

A constructed wetland of 2.2 ha which constitutes 5% of the contributing catchment can remove between 34%–63% of long-term total phosphorus inputs, with a median reduction rate of 48% (Tanner et al., 2020)<sup>6</sup>. This can be seen in Figure 6 below. These performance predictions do not apply for constructed wetlands whose main source is sub-surface drainage containing predominantly dissolved forms of phosphorus.

<sup>6</sup> Tanner, C.C., Sukias, J.P.S. and Woodward, B. (2020) Provisional guidelines for constructed wetland treatment of pastoral farm run-off. NIWA Client Report to DairyNZ, January 2020.





**Figure 6:** Long-term median annual Total Phosphorus (TP) reduction performance expectations. The solid line shows expected median; shaded area shows inter-annual and inter-site range of performance expected.

As a result, the calculations of P reduction within Ms Topham’s File Note shown in Figure 7 below accurately reflect that the constructed wetland could potentially remove an additional 38.7 kg/year of total phosphorus from the 34 ha of the contributing catchment within the landholding at a median reduction rate of 48%. Additionally, using the 34%–63% reduction range results in anywhere between 27-51kg/year of P being potentially removed by the wetland mitigation.

Overseer block name	Area (ha)	OverseerFM estimated P loss (kgP/ha)	Reduction in P loss due to wetland (estimated from wetland resource) (%)	Total reduction (kgP) (Ha x kgP/ha x %)
Non-Eff, Rolling – Puke, Apar	21.4	2.14	48	22.0
Eff, Rolling – Puke, Apar	9.1	2.20	48	9.6
Non effective area (laneways and tracks) – the losses from this area are accounted for in “other sources” below.	3.5			
<b>Total block Phosphorus loss mitigated</b>	<b>34.0</b>			<b>31.6</b>
Plus reduction in other sources losses	34/265.7	115	48	7.1
<b>Total farm Phosphorus loss mitigated</b>				<b>38.7</b>

**Figure 7:** Taken from the application showing Total Phosphorus removed by the constructed wetland at a 48% reduction rate.

Overall, the application has identified an additional 603 kgN/year will be lost and 5 kgP/year will be mitigated by the grass baleage wintering system and an average of 461 kgN/year and 39 kgP/year can be mitigated by the constructed wetland. As a result of the additional calculations, the overall N losses are predicted to increase by 142 kg/year and the overall P losses

are predicted to decrease by 44 kg/year. This increases the proposed dairy platform N losses to 41 kgN/ha but brings the P losses down to 2.2 kgP/ha. Despite the 142 kg/year increase in nitrogen due to calculations outside of Overseer, the nitrogen losses for the overall landholding are still reducing by 1,020 kgN/year or -8.6%.

It has been identified that loss of N and P via overland flow is of much greater concern than leaching of N to groundwater. If consent was granted, any GMPs and mitigations detailed in the application that have not been implemented yet should be imposed as consent conditions. This is to ensure that the potential effects from overland flow will be mitigated by the proposed GMPs and mitigations, provided that they are implemented.

***Microbes (e.g. E. coli) and sediment loss***

Sediment and microbiological contaminants are not modelled within Overseer. However, Phosphorus loss modelling can be used to indicate the probability of sediment and microbiological contaminant losses. This is because phosphorus in the soil readily bonds to fine soil particles and is therefore lost to the environment via the same contaminant pathways e.g. overland flow and erosion. Microbiological contaminants are also lost to the environment by the mechanics of water flow via these same pathways. In spite of this, P loss processes are not exactly the same as microbial and sediment losses, and therefore the assessment only provides a very broad assumption of the likely losses and risks to the environment from sediment and faecal indicator bacteria. That assumption being if P losses are predicted to reduce then there is likely to be a roughly similar level of reduction in sediment and microbe losses to freshwater.

**3.3.2.2 Water Quantity**

The applicant is proposing to abstract 72 m<sup>3</sup>/day and 26,280 m<sup>3</sup>/year. The daily take is the equivalent to 120 L/cow/day, which is the industry standard of efficient use for shed and stock water use. The rate of abstraction is less than 2 L/sec from bore E46/1068. The groundwater zone from which the water would be taken (Makarewa in both the RWP and pSWLP) is not over-allocated, and the proposed abstraction will not result in over-allocation. The closest waterway to the abstraction bore (E46/1068) is the Titipua Stream located 540 m south, and with the proposed maximum rate of abstraction of <2L per second, no hydraulic connection is expected.

**3.3.2.3 Soil Health**

The liquid effluent disposal field is proposed to remain at 88ha, no effluent is proposed to be discharged onto the new Schrama block. The proposed discharge area is more than the area needed to meet the minimum requirement of 4 hectares per 100 cows, which is calculated to achieve a maximum loading of 150 kg of nitrogen/hectare/year from effluent irrigation and more than the 8 hectares per 100 cows as recommended in the Best Practice Guidelines Booklet<sup>7</sup>.

**3.3.2.4 Odour**

As long as the effluent is applied in accordance with the specified application rates and depths, and the buffers specified by recommended consent conditions are maintained, then there should little risk of adverse effects from odour and spray drift on surrounding landowners and occupiers. Effluent storage and wintering facilities can cause problems with odour, however, the

<sup>7</sup> Farm Dairy Effluent, Best Practice Guidelines (2007), Environment Southland

closest dwelling on another property is located over 820 m from the effluent storage pond, proposed herd home winter barn and existing feed pad. Additionally, all facilities are more than 220 m from the property boundary. A recommended condition of consent requires that the stored or discharged agricultural effluent shall not cause any odour beyond the boundary of the site that is offensive or objectionable.

### **3.3.2.5 Oreti River**

Titipua Stream and another small tributary of the Titipua Stream run through parts of the applicant’s property and eventually join the Oreti River approximately 30 km downstream. The Oreti River is subject to the Water Conservation (Oreti River) Order 2008, which is a statutory instrument which recognises that the river is an outstanding habitat for brown trout and black-billed gulls, has outstanding angling amenity, and is significant in accordance with tikanga Māori. The Oreti River is also a Statutory Acknowledgement Area under Schedule 50 of the Ngāi Tahu Claims Settlement Act 1998, due to its cultural significance to Ngāi Tahu. The Oreti River ultimately drains to the New River Estuary, which is a shallow (~2 m depth) large (~4,100 ha) “tidal lagoon”. The primary issue when it comes to New River Estuary water quality is macro algae, elevated levels of faecal bacteria and sediment (and phosphorus which sticks to the surface of soil particles). The applicant proposes to, or already has, implemented GMPs and mitigations to prevent overland flow to the Oreti River. These include:

- (a) enhancing the wetland which drains to the Titipua Stream at the southern end of the property;
- (b) building a herd home winter barn to be used to winter 200 cows over winter as well as being available to house cows during adverse weather conditions; and
- (c) reducing the winter crop area from the permitted baseline of 17.7 ha to 10 ha.

I do note however, I am not a suitably qualified person with regard to the scale of potential effects on the Mauri of waterbodies and I also note the concerns Te Ao Marama Inc has on behalf of Waihōpai Rūnanga regarding the hauora of the Oreti River and its desire to be heard at the hearing.

### **3.3.3 Effects Conclusion**

- 3.3.3.1 The applicant has demonstrated that there will be sufficient storage available in the pond when the land is not suitable to discharge effluent to. The existing pond is synthetically lined, was authorised by land use consent AUTH-301083-V1 and has a leak detection system. The existing weeping wall and dual sludge beds have been visually inspected to ensure they have no holes, cracks or defects that would allow effluent to leak from the structures. The visual inspections have also been reviewed by a Chartered Professional Engineer (CPEng). Effluent will not be discharge onto the Schrama block and effluent can be discharged at low rates and depths which is consistent with the key policies in avoiding and mitigating effects on water quality. The water abstraction volume is considered efficient and reasonable for its end use, which is consistent with key water quantity policies. The calving pad allows the applicant to stand cows off pasture during adverse weather and the effluent generated on the pad is collected in the effluent system which ensures it can be managed and will not flow beyond the perimeter of the pad. The herd home winter barn (once constructed) will give the applicant the ability to winter less cows on crop and pasture and the structure has its own effluent storage facility in built which allows the applicant to discharge effluent collected as a permitted activity. In my opinion, the addition of the herd home winter barn as a mitigation along with constructing a wetland, using plantain (which can reduce nitrogen (N) leaching via reduced

rate of ammonia release in the rumen (Navarrete et al., 2016)<sup>8</sup> and N concentration of urine (Box et al., 2017)<sup>9</sup>, and decreasing the crop area below the permitted baseline will avoid, remedy or mitigate any potential or actual adverse effects that arise from the inclusion of 84.2 ha into the dairy platform. Overall, I consider the environmental effects will not be significantly adverse, with the exception of cultural effects. This is because there is a lack of assessment by a suitably qualified person of the potential cultural effects of the proposal so I am unable to conclude on the scale of potential effects on cultural values.

### **3.3.4 Monitoring (future)**

3.3.4.1 Groundwater monitoring does not currently occur on the property. Mr Ewen Rodway (Council’s Environmental Scientist) was asked to assess whether Groundwater quality monitoring would be appropriate in this scenario. Mr Rodway confirmed “E46/1068 in not particularly suitable due to its depth (top of screen at 27m bgl), because of this, I would not recommend that this bore is used for groundwater quality monitoring.” Mr Rodway also confirmed “the physiographic setting makes groundwater quality monitoring less appropriate for measuring the effects of this activity”.

3.3.4.2 Should consent be granted, it is recommended that two compliance inspections be carried out on the property per year. These inspections will be added as an advice note to the discharge permit for the landholding. The number of inspections required is in my opinion appropriate because:

- most dairy farms in Southland have two or three compliance inspections each year;
- the applicant is proposing to winter 200 dairy cows in a herd home winter barn and the remainder of the herd on either 10 ha of crop or grass and baleage; and
- the calving pad will be utilised for up to 120 cows during the months of August to October.

### **3.3.5 Consideration of Alternatives**

3.3.5.1 The application included an assessment of alternatives for the change of land use for the Schrama block and the discharge activity. The alternatives included continuing operations on the Schrama block, as they currently exist, and alternative methods of discharge to water and discharge to land on an “as required” basis regardless of the conditions.

3.3.5.2 The applicant considered “the proposal results in a significant reduction in contaminant loadings on the property. This will not occur if operations continue as they are [on the Schrama block]”. The applicant considered discharge to water would be more detrimental to the receiving environment than discharge to land. The applicant also considers discharge on an “as required” basis “would likely result in over saturation of soils, ponding, overland flow and/or excessive leaching which all lead to significant adverse environmental effects.” The consideration of alternatives is addressed further in this report in the section on Section 105 of the RMA.

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<sup>8</sup> Navarrete, S., Kemp, P.D., Pain, S.J. Back, P.J. 2016. Bioactive compounds, aucubin and acteoside, in plantain (*Plantago lanceolata* L.) and their effect on in vitro rumen fermentation. *Animal Feed Science and Technology* 222: 158–167.

<sup>9</sup> Box, L.A., Edwards, G.R., Bryant, R.H. 2017. Milk production and urinary nitrogen excretion of dairy cows grazing plantain in early and late lactation. *New Zealand Journal of Agricultural Research* 60: 470-482.

**3.4 Relevant provisions of the relevant regional plan objectives, policies and rules (Section 104(1)(b)(v))**

3.4.1 At present both the Regional Water Plan for Southland and the proposed Southland Water and Land Plan are in effect. The Regional Water Plan is operative. The proposed Southland Water and Land Plan has been through the notification, submission and hearing stages, and is currently before the Court with regard to decisions on appeals.

3.4.2 For completeness, if there is a conflict between the planning framework of the Regional Water Plan for Southland and the proposed Southland Water and Land Plan, I consider greater weight should be placed on the proposed Southland Water and Land Plan framework. This is because the proposed Southland Water and Land Plan is a more recent planning document, which has been developed under the National Policy Statement for Freshwater Management and has been through a submissions and hearing process where the majority of the objectives have been resolved.

3.4.3 Both plans pre-date the NPSFM 2020 so may not fully give effect to it. Therefore, regard should be given to the higher order document.

**3.4.4 Regional Water Plan (2010)**

The application is not inconsistent with the relevant objectives and policies of the Regional Water Plan. The following objectives and policies in the Regional Water Plan for Southland are of particular relevance to this application:

**Water Quality**

*Objective 2 To manage water quality so that there is no reduction in the quality of the water in any surface water body, beyond the zone of reasonable mixing for discharges, below that of the date this Plan became operative.*

*Objective 3 To maintain and enhance the quality of surface water bodies so that the following values are protected where water quality is already suitable for them, and where water quality is currently not suitable, measurable progress is achieved towards making it suitable for them.*

*In surface water bodies classified as mountain, hill, lake-fed, spring-fed, lowland (hard bed), lowland (soft bed) and Mataura 1, Mataura 2 and Mataura 3:*

- (a) bathing, in those sites where bathing is popular;*
- (b) trout where present, otherwise native fish;*
- (c) stock drinking water;*
- (d) Ngāi Tahu cultural values, including mahinga kai;*
- (e) natural character including aesthetics.*

*Objective 4 To manage the discharge of contaminants and encourage best environmental practice to improve the water quality in surface water bodies classified as hill, lowland (hard bed), lowland (soft bed) and spring fed, and in particular to achieve a minimum of 10 percent improvement in levels of the following water quality parameters over 10 years from the date this Plan became operative (January 2010):*

- (a) microbiological contaminants*

- (b) *nitrate*
  - (c) *phosphorus*
  - (d) *clarity*
- Policy 6*            (a) *Use non-regulatory methods, in addition to rules, to maintain and enhance surface water and groundwater quality, and to avoid, remedy or mitigate adverse effects on soil quality.*
- (b) *Assess on an ongoing basis whether the adoption of non-regulatory methods has resulted in improvements to water or soil quality, and consider the introduction of other interventions if improvements have not resulted.*
- Policy 7*            *Prefer discharges to land over discharges to water where this is practicable and the effects are less adverse.*
- Policy 13*           *Avoid the point source discharge of raw sewage, foul water and untreated agricultural effluent to water.*
- Policy 25*           *To avoid, remedy or mitigate the adverse effects arising from point source and non-point source discharges so that there is no deterioration in groundwater quality after reasonable mixing, unless it is consistent with the promotion of the sustainable management of natural and physical resources, as set out in Part 2 of the Resource Management Act 1991, to do so.*
- Water Quantity**
- Objective 5*        *To have sufficient water to support the reasonably foreseeable needs of current and future generations and enable people and communities to provide for their social, economic and cultural wellbeing while protecting aquatic ecosystem health, life supporting capacity, natural character and historic heritage values of surface water bodies.*
- Objective 7*        *To maximise the efficiency of water use.*
- Objective 9*        *To ensure that the total volume and rate of groundwater abstraction is sustainable.*
- Policy 21*           *To ensure that the rate of abstraction and abstraction volumes specified on water permits to take and use water are no more than reasonable for the intended end use.*
- Policy 22*           *Require, where appropriate, the installation of water measuring devices on all new permits to take and use water.*
- Policy 23*           *Impose a condition enabling the review of consent conditions in accordance with Sections 128 and 129 of the Resource Management Act 1991 on all new permits to take and use water*
- Policy 28*           *To manage groundwater abstraction to avoid significant adverse effects on:*
- *long-term aquifer storage volumes*
  - *existing water users*

- *surface water flows and aquatic ecosystems and habitats*
- *groundwater quality*

*Policy 29*                      *Manage the stream depletion effect of any groundwater abstraction with a rate of take exceeding 2 litres per second.*

*Policy 30*                      *Use a staged management approach to allocate groundwater for abstraction in Southland to allow the knowledge gained by the progressive development of the region’s groundwater resources to be built into its future management and recognise and assess the different characteristics of aquifer types.*

**Land and Soils**

*Objective 9A*                      *To manage discharges onto or into land so that the quality and structure of soil resources are maintained.*

*Policy 31A*                      *Match the level of management that is required for discharges of contaminants onto or into land to the level of environmental risk posed by the following risk factors:*

- (a) nature and quantity of contaminants in the discharge*
- (b) sloping land*
- (c) soils with artificial drainage or coarse structures*
- (d) soils with impeded drainage or low infiltration rates*
- (e) well drained soils*
- (f) climate*
- (g) proximity to groundwater*
- (h) proximity to surface water*
- (i) soil’s current physical, chemical and biological characteristics and its potential to leach nutrients*
- (j) natural hazards (for example, flooding and erosion).*

*Policy 31C*                      *Manage discharges of contaminants onto or into land to avoid, remedy or mitigate adverse effects, including on:*

- (a) soil quality;*
- (b) amenity values;*
- (c) habitats, ecosystems and indigenous biological diversity;*
- (d) historic heritage, cultural and traditional values;*
- (e) natural character;*
- (f) outstanding natural features.*

*Policy 31D*                      *Encourage the beneficial reuse of materials where this is appropriate, and promote discharges of these materials onto or into land to maximise the potential reuse of the nutrients and water contained in the discharge.*

**Term and granting of Consent**

*Policy 14A*                      *To determine the term of a water permit consideration will be given, but not limited, to:*

- (a) the degree of certainty regarding the nature, scale, duration and frequency of adverse effects from the activity;*
- (b) the level of knowledge of the resource;*
- (c) relevant tangata whenua values*

- (d) *the allocation sought, particularly the proportion of the resource sought;*
- (e) *the duration sought by the applicant, plus material to support the duration sought;*
- (f) *the permanence and economic life of the activity;*
- (g) *capital investment in the activity;*
- (h) *monitoring and review requirement in permit conditions;*
- (i) *the desirability of applying a common expiry date for water permits that allocate water from the same resource; and*
- (j) *the applicant's compliance with the conditions of the previous permit (where a new water permit is sought for a previously authorised activity).*

*Policy 14B*      *In addition to the matters specified in section 104 of the Act, when considering a water permit application for a previously authorised activity where:*

- (a) *the status of the activity has altered solely as a consequence of subsequent permits being granted to increase allocation from that resource;*
- (b) *the activity and knowledge of its adverse effects are the same or similar in character, intensity, and scale to that which existed previously; and*
- (c) *the adverse environmental effects of the activity are not significant.*

*Policy 43*      *Match consent duration and inspection and audit requirements on resource consents to apply farm dairy effluent to land to the level of risk of adverse environmental effects.*

### **Wetlands**

*Policy 40*      *Encourage the maintenance and restoration of existing wetlands and the creation of new wetlands.*

### **Agricultural Effluent**

*Policy 41*      *Avoid adverse effects on water quality, and avoid as far as possible other adverse environmental effects, associated with the location, design, construction, operation and maintenance of agricultural effluent ponds.*

*Policy 42*      *Avoid adverse effects on water quality and other adverse environmental effects associated with the application of farm dairy effluent to land by matching farm dairy effluent management to receiving environment risk.*

### **Comment**

The proposed activities are consistent with the relevant objectives and policies of the RWP. The proposed discharge is to land rather than water, and is expected to appropriately mitigate any potential adverse effects on water quality through the provision of low rate discharge, buffers to surface waterbodies and sufficient effluent storage. The land use consent for the herd home winter barn and associated effluent storage will include conditions relating to the appropriate location, design, construction, operation and maintenance of the structure. The level of risk is taken into consideration, including in relation to recommending compliance monitoring. The proposed wetland construction is consistent with policy 40. The proposed water abstraction will not exceed 2 L/s so is not expected to result in stream depletion and will not result in full allocation or over-allocation of the groundwater zone. The volume of water the applicant is



seeking is deemed an efficient use of water at 120 L/cow/day. Furthermore, the applicant uses a greenwash which maximises the efficiency of water use. The water permit will include a condition relating to the installation of a water meter and a review condition. Term of consent is considered in Section 4.2 below.

### 3.4.5 Proposed Southland Water and Land Plan (2018)

The application is not inconsistent with the relevant objectives of the Proposed Southland Water and Land Plan. The following provisions are relevant to the application and are considered in turn below.

#### Interpretation Statement

All persons exercising functions and powers under this Plan and all persons who use, develop or protect resources to which this Plan applies shall recognise that:

- (i) Objectives 1 and 2 are fundamental to this plan, providing an overarching statement on the management of water and land, and all objectives are to be read together and considered in that context; and
- (ii) the plan embodies ki uta ki tai and upholds Te Mana o Te Wai and they are at the forefront of all discussions and decisions about water and land.

*Objective 1 Land and water and associated ecosystems are sustainably managed as integrated natural resources, recognising the connectivity between surface water and groundwater, and between freshwater, land and the coast.*

*Objective 3 Water and land are recognised as enablers of the economic, social and cultural wellbeing of the region.*

#### Ngai Tahu

*Objective 2 The mauri of water provides for te hauora o te taiao (health and mauri of the environment), te hauora o te wai (health and mauri of the waterbody) and te hauora o te tangata (health and mauri of the people).*

*Objective 4 Tangata whenua values and interests are identified and reflected in the management of freshwater and associated ecosystems.*

*Policy 1 Enable Papatipua Runanga to effectively undertake their Kaitiaki responsibilities in freshwater and land management through the methods listed in the Policy.*

*Policy 2 Take into account Iwi Management Plans.*

#### Comment

Te Tangi a Tauira, and the views of Te Rūnanga o Ngāi Tahu and Te Ao Marama Inc have been taken into account in assessing the application. According to the applicant, Te Ao Marama Inc was first involved in the application process just prior to the application being publicly notified and has since had subsequent discussions with the applicant to address the concerns raised in the submission from Waihōpai Rūnanga. Te Ao Marama Inc was also involved in the consultation phase and development of the pSWLP objectives and policies. It is noted in this context that Te Ao Marama Inc, on behalf of Waihōpai Rūnanga, submitted and wishes to be heard in relation to this application.

## **Physiographic Zone**

### **Policy 6**

*In the Gleyed and Lignite-Marine Terraces physiographic zones avoid, remedy or mitigate adverse effects on water quality from contaminants, by:*

- 1. requiring implementation of good management practices to manage adverse effects on water quality from contaminants transported via artificial drainage and overland flow where relevant; and*
- 2. having particular regard to adverse effects on water quality from contaminants transported via artificial drainage and overland flow where relevant when assessing resource consent applications and preparing or considering Farm Environmental Management Plans.*

### **Policy 11**

*In the Peat Wetlands physiographic zone avoid, remedy or mitigate adverse effects on water quality from contaminants, by:*

- 1. requiring implementation of good management practices to manage adverse effects on water quality from contaminants transported via artificial drainage, deep drainage and lateral drainage;*
- 2. having particular regard to adverse effects on water quality from contaminants transported via artificial drainage, deep drainage and lateral drainage when assessing resource consent applications and preparing or considering Farm Environmental Management Plans; and*
- 3. decision makers generally not granting resource consents for additional dairy farming of cows or additional intensive winter grazing where contaminant losses will increase as a result of the proposed activity.*

## **Comment**

The physiographic zones relate to the classification of land and risks to water quality based on factors including soil types, landscape classification, climate, topography and water chemistry. These have been developed to better understand Southland's water and why the quality is better in some areas than others. These policies are particularly relevant to land use activities such as farming.

The mitigations proposed by the applicant target both the overland flow and deep drainage contaminant pathways, such as constructing a wetland, building a herd home winter barn, reducing winter crop area below the permitted baseline and incorporating plantain into the re-grassing programme. Furthermore, consent conditions will require the applicant to reduce Olsen P to agronomic optimum and reduce synthetic nitrogen fertiliser to below the NES-F cap of 190 kg/ha/year, which both target the contaminant pathways mentioned in Policies 6 and 11 above.

## **Water Quality**

### **Objective 6**

*Water quality in each freshwater body, coastal lagoon and estuary will be:*

- (a) maintained where the water quality is not degraded; and*
- (b) improved where the water quality is degraded by human activities.*

### **Objective 8**

- (a) The quality of groundwater that meets both the Drinking Water Standards for New Zealand 2005 (revised 2008) and any freshwater objectives, including for connected surface water bodies, established under Freshwater Management Unit processes is maintained; and*

- (b) *The quality of groundwater that does not meet Objective 8(a) because of the effects of land use or discharge activities is progressively improved so that:*
- (1) *groundwater (excluding aquifers where the ambient water quality is naturally less than the Drinking Water Standards for New Zealand 2005 (revised 2008)) meets the Drinking Water Standards for New Zealand 2005 (revised 2008); and*
  - (2) *groundwater meets any freshwater objectives and freshwater quality limits established under Freshwater Management Unit processes.*
- Policy 13*
1. *Recognise that the use and development of Southland’s land and water resources, including for primary production, enables people and communities to provide for their social, economic and cultural wellbeing.*
  2. *Manage land use activities and discharges (point source and non-point source) to enable the achievement of Policies 15A, 15B and 15C.*
- Policy 14*
- Prefer discharges of contaminants to land over discharges of contaminants to water, unless adverse effects associated with a discharge to land are greater than a discharge to water. Particular regard shall be given to any adverse effects on cultural values associated with a discharge to water*
- Policy 15B*
- Where existing water quality does not meet the Appendix E Water Quality Standards or bed sediments do not meet the Appendix C ANZECC sediment guidelines, improve water quality including by:*
1. *avoiding where practicable and otherwise remedying or mitigating any adverse effects of new discharges on water quality or sediment quality that would exacerbate the exceedance of those standards or sediment guidelines beyond the zone of reasonable mixing; and*
  2. *requiring any application for replacement of an expiring discharge permit to demonstrate how and by when adverse effects will be avoided where practicable and otherwise remedied or mitigated, so that beyond the zone of reasonable mixing water quality will be improved to assist with meeting those standards or sediment guidelines.*
- Policy 16*
1. *Minimising the adverse environmental effects (including on the quality of water in rivers, coastal lakes, lagoons, tidal estuaries, salt marshes and coastal wetlands, and groundwater) from farming activities by:*
    - (a) *strongly discouraging the establishment of new dairy farming or new intensive winter grazing activities in close proximity to Regionally Significant Wetlands and Sensitive Waterbodies identified in Appendix A;*
    - (b) *ensuring that, in the interim period prior to the development of freshwater objectives under Freshwater Management Unit processes, applications to establish new, or further intensify existing, dairy farming of cows or intensive winter grazing activities will generally not be granted where:*
      - i) *the adverse effects, including cumulatively, on the quality of groundwater, or water in lakes, rivers, artificial or*

- modified water courses, tidal estuaries, salt marshes and wetlands cannot be avoided or fully mitigated; or*
            - ii) *existing water quality is already degraded to the point of being over-allocated; or*
            - iii) *water quality does not meet the Appendix E Water Quality Standards or bed sediments do not meet Appendix C ANZECC sediment guidelines; and*
          - (c) *ensuring that, after the development of freshwater objectives under Freshwater Management Unit processes, applications to establish new, or further intensify existing, dairy farming of cows or intensive winter grazing activities:*
            - i) *will generally not be granted where freshwater objectives are not being met; and*
            - ii) *where freshwater objectives are being met, will generally not be granted unless the proposed activity will maintain the overall quality of groundwater and water in lakes, rivers, artificial and modified watercourses, wetlands, tidal estuaries and salt marches.*
2. *Requiring all farming activities, including existing activities, to:*
- (a) *implement a Farm Environmental Management Plan, as set out in Appendix N;*
  - (b) *actively manage sediment run-off risk from farming and hill country development by identifying critical source areas and implementing practices including setbacks from waterbodies, sediment traps, riparian planting, limits on areas or duration of exposed soils and the prevention of stock entering the beds of surface waterbodies;*
  - (c) *manage collected and diffuse run-off and leaching of nutrients, microbial contaminants and sediment through the identification and management of critical source areas within individual properties.*
3. *When considering a resource consent application for farming activities, consideration should be given to the following matters:*
- (a) *whether multiple farming activities (such as cultivation, riparian setbacks, and winter grazing) can be addressed in a single resource consent; and*
  - (b) *granting a consent duration of at least 5 years.*

### **Effluent Management**

#### **Policy 17**

1. *Avoid significant adverse effects on water quality, and avoid, remedy or mitigate other adverse effects of the operation of, and discharges from, agricultural effluent management systems.*
2. *Manage agricultural effluent systems and discharges from them by:*
  - (a) *designing, constructing and locating systems appropriately and in accordance with best practice;*
  - (b) *maintaining and operating agricultural effluent systems in accordance with best practice guidelines;*
  - (c) *avoiding any surface run-off or overland flow, ponding or contamination of water, including sub-surface drainage,*

- resulting from the application of agricultural effluent to pasture;  
and  
(d) avoiding the discharge of untreated agricultural effluent to water.*

**Comment**

The landholding is not located within close proximity of any Regionally Significant Wetlands or Sensitive Waterbodies. The applicant has proposed mitigations in order to avoid or mitigate any adverse effects on water quality such as constructing a wetland, building a herd home winter barn, reducing winter crop area below the permitted baseline and incorporating plantain into the re-grassing programme. The landholding has an up-to-date Farm Environmental Management Plan, which was prepared in accordance with Appendix N of the Southland Water and Land Plan (Decisions Version). The new effluent storage facility will be appropriately located, designed and constructed. As a result of the above, I consider the proposal is consistent with Policies 13, 14, 15B, 16 and 17.

**Water Quantity**

*Objective 11 The amount of water abstracted is shown to be reasonable for its intended use and water is allocated and used efficiently.*

*Objective 12 Groundwater quantity is sustainably managed, including safeguarding the life-supporting capacity, ecosystem processes and indigenous species of surface water bodies where their flow is, at least in part, derived from groundwater.*

*Objective 13 Provided that:  
(a) the quantity, quality and structure of soil resources are not irreversibly degraded through land use activities or discharges to land; and  
(b) the health of people and communities is safeguarded from the adverse effects of discharges of contaminants to land and water; and  
(c) ecosystems (including indigenous biological diversity and integrity of habitats), are safeguarded, then land and soils may be used and developed to enable the economic, social and cultural wellbeing of the region.*

*Policy 20 Manage the taking, abstraction, use, damming or diversion of surface water and groundwater so as to:  
1A. recognise that the use and development of Southland’s land and water resources, including for primary production, can have positive effects including enabling people and communities to provide for their social, economic and cultural wellbeing;  
1. avoid, remedy or mitigate adverse effects from the use and development of surface water resources on:  
(a) the quality and quantity of aquatic habitat, including the life supporting capacity and ecosystem health and processes of water bodies;  
(b) natural character values, natural features, and amenity, aesthetic and landscape values;  
(c) areas of significant indigenous vegetation and significant habitats of indigenous fauna;  
(d) recreational values;*

- (e) *the spiritual and cultural values and beliefs of tangata whenua;*
  - (f) *water quality, including temperature and oxygen content;*
  - (g) *the reliability of supply for lawful existing surface water users, including those with existing, but not yet implemented, resource consents;*
  - (h) *groundwater quality and quantity; and*
  - (j) *mātaitai, taiāpure and nohoanga;*
2. *avoid, remedy or mitigate significant adverse effects from the use and development of groundwater resources on:*
    - (a) *long-term aquifer storage volumes;*
    - (b) *the reliability of supply for lawful existing groundwater users, including those with existing, but not yet implemented, resource consents;*
    - (c) *surface water flows and levels, particularly in spring-fed streams, natural wetlands, lakes, aquatic ecosystems and habitats (including life supporting capacity and ecosystem health and processes of water bodies) and their natural character; and*
    - (d) *water quality;*
  3. *ensure water is used efficiently and reasonably by requiring that the rate and volume of abstraction specified on water permits to take and use water are no more than reasonable for the intended end use following the criteria established in Appendix O and Appendix L.4.*

*Policy 21*

*Manage the allocation of surface water and groundwater by:*

1. *determining the primary allocation for confined aquifers not identified in Appendix L.5, following the methodology established in Appendix L.6;*
2. *determining that a water body is fully allocated when the total volume of water allocated through current resource consents and permitted activities is equal to either:*
  - (a) *the maximum amount that may be allocated under the rules of this Plan, or*
  - (b) *the provisions of any water conservation order;*
3. *enabling secondary allocation of surface water and groundwater subject to appropriate surface water environmental flow regimes, minimum lake and wetland water levels, minimum groundwater level cutoffs or seasonal recovery triggers, to ensure:*
  - (a) *long-term aquifer storage volumes are maintained; and*
  - (b) *the reliability of supply for existing groundwater users (including those with existing resource consents for groundwater takes that have not yet been implemented) is not adversely affected.*

*Policy 22*

*Manage the effects of surface and groundwater abstractions by:*

1. *avoiding allocating water to the extent that the effects on surface water flow would not safeguard the mauri of that waterway and mahinga kai, taonga species or the habitat of trout and salmon, in accordance with Appendix K;*
2. *ensuring interference effects are acceptable, in accordance with Appendix L.3; and*

3. *utilising the methodology established in Appendix L.2 to: (a) manage the effects of consented groundwater abstractions on surface water bodies; and (b) assess and manage the effects of consented groundwater abstractions in groundwater management zones other than those specified in Appendix L.5.*

#### **Comment**

The proposed water abstraction will not exceed 2 L/s so is not expected to result in stream depletion. The aquifer has been identified in Appendix L.5 and the proposed abstraction will not result in full allocation or over-allocation of that aquifer. The volume of water the applicant is seeking is deemed a reasonable and efficient use of water at 120 L/cow/day. The water permit will include a condition relating to the installation of a water meter and a review condition.

#### **Freshwater Management Unit Policies**

*Policy 44* *Te Mana o te Wai is recognised at a regional level by tangata whenua and the local community identifying values held for, and associations with, a particular water body and freshwater management unit.*

*Particular regard will be given to the following values, alongside any additional regional and local values determined in the Freshwater Management Unit limit setting process:*

- *Te Hauora o te Wai (the health and mauri of water);*
- *Te Hauora o te Tangata (the health and mauri of the people);*
- *Te Hauora o te Taiao (the health and mauri of the environment);*
- *Mahinga kai;*
- *Mahi māra (cultivation);*
- *Wai Tapu (Sacred Waters);*
- *Wai Māori (municipal and domestic water supply);*
- *Āu Putea (economic or commercial value);*
- *He ara haere (navigation).*

*Policy 45* *In response to Ngāi Tahu and community aspirations and local water quality and quantity issues, FMU sections may include additional catchment-specific values, objectives, policies, attributes, rules and limits which will be read and considered together with the Region-wide Objectives and Region-wide Policies. Any provision on the same subject matter in the relevant FMU section of this Plan prevails over the relevant provision within the Region-wide Objectives and Region-wide Policy sections, unless it is explicitly stated to the contrary.*

*As the FMU sections of this Plan are developed in a specific geographical area, FMU sections will not make any changes to the Region-wide Objectives or Region-wide Policies.*

*Policy 46* *The FMU Sections of this Plan are based on the following identified Freshwater Management Units for Southland, as shown on Map Series 6: Freshwater Management Units:*

- *Fiordland and Islands;*
- *Aparima and Pourakino – Jacobs River Estuary;*
- *Mataura – Toetoes Harbour;*

- *Ōreti and Waihopai – New River Estuary; and*
- *Waiau – Waiau Lagoon.*

### **Comment**

The above provisions relate to the identification of Freshwater Management Units and the subsequent development of policies and rules. As part of this process, water quality and quantity limits will be set for each unit. This is part of the process of addressing water quality and the direction provided by the NPS for Freshwater Management 2020.

### **Term and Consideration of Consent**

*Policy 39* When considering any application for resource consent for the use of land for a farming activity, the Southland Regional Council should consider all adverse effects of the proposed activity on water quality, whether or not this Plan permits an activity with that effect.

*Policy 39A* When considering the cumulative effects of land use and discharge activities within whole catchments, consider:

1. *the integrated management of freshwater and the use and development of land including the interactions between freshwater, land and associated ecosystems (including estuaries); and*
2. *through the Freshwater Management Unit process, facilitating the collective management of nutrient losses, including through initiatives such as nutrient user groups and catchment management groups.*

*Policy 40* When determining the term of a resource consent consideration will be given to a range of factors, fully listed in the policy.

*Policy 41* Consider the risk of adverse environmental effects occurring and their likely magnitude when determining requirements for auditing and supply of monitoring information on resource consents

*Policy 42* When considering resource consent applications for water permits to take and use water:

1. *except for non-consumptive uses, consent will not be granted if a water body is over allocated or fully allocated; or to grant consent would result in a water body becoming over allocated or would not allow an allocation target for a water body to be achieved within a time period defined in this Plan;*
2. *except for non-consumptive uses, consents replacing an expiring resource consent for an abstraction from an over-allocated water body will generally only be granted at a reduced rate, the reduction being proportional to the amount of over-allocation and previous use, using the method set out in Appendix O;*
3. *installation of water measuring devices will be required on all new permits to take and use water and on existing permits in accordance with the Resource Management (Measurement and Reporting of Water Takes) Regulations 2010;*
4. *where appropriate, minimum level or flow cut-offs and seasonal recovery triggers on resource consents for groundwater abstraction will be imposed; and*



5. *conditions will be specified relating to a minimum flow or level, or environmental flow or level regime (which may include flow sharing), in accordance with Appendix K, for all new or replacement resource consents (except for water permits for non-consumptive uses, community water supplies and water bodies subject to minimum flow and level regimes established under any water conservation order) for:*
  - (a) *surface water abstraction, damming, diversion and use; and*
  - (b) *groundwater abstraction in accordance with Policy 23.*

**Comment**

Term of consent, and in particular the full range of factors in Policy 40, is considered in Section 4.2 below.

**Conclusion to Policy Assessment – Regional Plans**

The activities have been considered against all relevant provisions of the RWP and the pSWLP. The key policies from the RWP relate to water quality, soil health and water quantity. I consider that the proposed activities are consistent with these provisions. The key policies in the pSWLP relate to the physiographic zones which the site is located in and directions around maintaining and/or improving water quality. I consider that the proposed activities are generally consistent with these provisions.

**3.5 Relevant provisions of the Southland Regional Policy Statement (Section 104(1)(b)(v))**

3.5.1 The Southland Regional Policy Statement 2017 became operative on 9 October 2017. It pre-dates the NPSFM 2020, so may not fully give effect to it. Therefore, regard should be given to the higher order document.

3.5.2 The following objectives and policies in the Regional Policy Statement are of particular relevance to this application:

**Tangata Whenua**

*Objective TW.1 The principles of the Treaty of Waitangi/Te Tiriti o Waitangi are taken into account in a systematic way through effective partnerships between tangata whenua and local authorities, which provide the capacity for tangata whenua to be fully involved in council decision-making processes.*

*Objective TW.2 All local authority resource management processes and decisions take into account iwi management plans.*

*Policy TW.1 Consult with, and enhance tangata whenua involvement in local authority resource management decision-making processes, in a manner that is consistent with the principles of the Treaty of Waitangi/Te Tiriti o Waitangi.*

*Policy TW.2 Actively foster partnerships and relationship agreements between local authorities and tangata whenua.*

*Policy TW.3 Take iwi management plans into account within local authority resource management decision making processes.*

- Policy TW.4* When making resource management decisions, ensure that local authority functions and powers are exercised in a manner that:
- (a) recognises and provides for:
    - (i) traditional Māori uses and practices relating to natural resources (e.g. mātaihai, kaitiakitanga, manaakitanga, matauranga, rāhui, wāhi tapu, taonga raranga);
    - (ii) the ahi kā (manawhenua) relationship of tangata whenua with and their role as kaitiaki of natural resources;
    - (iii) mahinga kai and access to areas of natural resources used for customary purposes; (iv) mauri and wairua of natural resources;
    - (v) places, sites and areas with significant spiritual or cultural historic heritage value to tangata whenua;
    - (vi) Māori environmental health and cultural wellbeing.
  - (b) recognises that only tangata whenua can identify their relationship and that of their culture and traditions with their ancestral lands, water, sites, wāhi tapu and other taonga.

### **Water Quality**

*Objective WQUAL.1* Water quality goals Water quality in the region:

- (a) safeguards the life-supporting capacity of water and related ecosystems;
  - (b) safeguards the health of people and communities;
  - (c) is maintained, or improved in accordance with freshwater objectives formulated under the National Policy Statement for Freshwater Management 2014;
  - (d) is managed to meet the reasonably foreseeable social, economic and cultural needs of future generations.
- Policy WQUAL.1*
- (a) Identify values of surface water, groundwater, and water in coastal lakes, lagoons, tidal estuaries, salt marshes and coastal wetlands, and formulate freshwater objectives in accordance with the National Policy Statement for Freshwater Management 2014; and
  - (b) Manage discharges and land use activities to maintain or improve water quality to ensure freshwater objectives in freshwater management units are met.
- Policy WQUAL.2* Maintain or improve water quality, having particular regard to the following contaminants:
- (a) nitrogen;
  - (b) phosphorus;
  - (c) sediment;
  - (d) microbiological contaminants.
- Policy WQUAL.3* Identify and protect the significant values of wetlands and outstanding freshwater bodies.
- Policy WQUAL.5* Improve water quality by:
- (a) identifying water bodies that are not meeting freshwater objectives, including identifying priority freshwater management units;
  - (b) specifying targets to improve water quality within those water bodies within defined timeframes;

- (c) *implementing management frameworks to meet the targets taking into account;*
  - (i) *the values supported by the water body/ies;*
  - (ii) *national or legislative standards and requirements;*
  - (iii) *the benefits and costs associated with achieving improvement in water quality*

*Policy WQUAL.7 Recognise the social, economic and cultural benefits that may be derived from the use, development or protection of water resources.*

*Policy WQUAL.8 Prefer discharges of contaminants to land over discharges of contaminants to water, where*

- (a) *a discharge to land is practicable*
- (b) *the adverse effects associated with a discharge to land are less than a discharge to water.*

*Policy WQUAL.11 Avoid, as far as practicable, remedy or mitigate the risks that the adverse effects of land use activities and discharges of contaminants have on the sources of community water supplies.*

*Policy WQUAL.13 Continue to improve knowledge and understanding of water resources, and the relationship of land use activities with water quality values in water bodies, in Southland to promote the sustainable management of water.*

### **Water Quantity**

*Objective WQUAN.1 Flows, levels and allocation regimes of surface water and groundwater in the region are developed in accordance with the National Policy for Freshwater Management 2014 to:*

- (a) *safeguard the life-supporting capacity of water, catchments and related ecosystems;*
- (b) *support the maintenance or improvement of water quality in accordance with Policy WQUAL.1;*
- (c) *meet the needs of a range of uses, including the reasonably foreseeable social, economic and cultural needs of future generations;*
- (d) *comply with limits or targets set to achieve freshwater objectives.*

*Objective WQUAN.2 The allocation and use of Southland's water resources is efficient.*

*Policy WQUAN.2 Avoid over-allocation of surface water and groundwater, and resolve any historical instances of over allocation, while recognising the special provisions made for the Waiau catchment.*

*Policy WQUAN.6* (a) *Ensure that any water taken from surface water or groundwater is used efficiently.*  
(b) *Where fresh water bodies are approaching full allocation, consider establishing management provisions to maximise the efficiency of using any available water.*

## **Rural Land and Soils**

*Objective RURAL.1 Sustainable use of rural land resource Achieve sustainable use of Southland's rural land resource, in respect of:*

- (a) agriculture and primary sector activities;*
- (b) subdivision, use and development activities;*
- (c) earthworks and vegetation clearance activities;*
- (d) the use of soil resources;*
- (e) mineral extraction activities; and*
- (f) on-site wastewater systems.*

*Objective RURAL.2 Life-supporting capacity of soils Safeguard the life-supporting capacity, mauri and health of soils in rural areas, and prevent or minimise soil erosion and sedimentation from land use soil disturbance.*

*Policy RURAL.1 Recognise that use and development of Southland's rural land resource enables people and communities to provide for their social, economic and cultural wellbeing.*

*Policy RURAL.2 Maintain land use change activities in rural areas of Southland, in a way that maintains or enhances rural amenity values and character.*

*Policy RURAL.4 Avoid the irreversible loss of high value soils from productive use, through inappropriate subdivision, use and development.*

*Policy RURAL.5 The effects of rural land development shall be sustainably managed and land management practices encouraged so that:*

- (a) soil properties are safeguarded;*
- (b) soil erosion is minimised;*
- (c) soil compaction and nutrient and sediment loss is minimised;*
- (d) soil disturbance is reduced;*
- (e) water quality is maintained or enhanced;*
- (f) indigenous biodiversity is maintained or enhanced;*
- (g) the mauri of water and soils is safeguarded.*

## **Comment**

The proposed activities are consistent with the policies in the Regional Policy Statement. Tangata whenua were first involved in the application prior to notification and have had subsequent communication with the applicant since they were notified and subsequently submitted. Te Tangi a Tauria is considered in Section 3.9 below.

The proposed land use activity should not result in a reduction in water quality as long as mitigations offered in the application, such as constructing a wetland, building a herd home winter barn, reducing winter crop area below the permitted baseline and incorporating plantain into the re-grassing programme, are implemented correctly and in a timely manner. Furthermore, the discharge is to land, not water, and consent conditions will require the applicant reduce its Olsen P to agronomic optimum and reduce synthetic nitrogen fertiliser to below the NES-F cap of 190 kg/ha/year which should, in theory, improve water quality. Low rate irrigation and sufficiently sized effluent storage also aids in the sustainable management of high value rural soils. The water abstraction volume sought will not result in over allocation and is calculated as 120 L/cow/day, which is considered efficient use for stock drinking and dairy shed wash down purposes.

### 3.6 Relevant provisions of National Policy Statements (Section 104(1)(b)(iii))

#### 3.6.1 National Policy Statement for Freshwater Management (NPS-FM) 2020

3.6.1.1 The National Policy Statement for Freshwater Management 2020 came into force on 3 September 2020, replacing the earlier National Policy Statement for Freshwater Management 2014. The NPSFM supports improved freshwater management in New Zealand. It does this by directing regional councils to establish objectives and set limits for freshwater in their regional plans.

3.6.1.2 The following provisions in the National Policy Statement for Freshwater Management (NPS-FM) 2020 are of particular relevance to this application:

Section 1.3 of the NPSFM refers to Te Mana o te Wai as a fundamental concept:

*“Te Mana o te Wai is a concept that refers to the fundamental importance of water and recognises that protecting the health of freshwater protects the health and well-being of the wider environment. It protects the mauri of the wai. Te Mana o te Wai is about restoring and preserving the balance between the water, the wider environment, and the community.”*

*“Te Mana o te Wai encompasses 6 principles relating to the roles of tangata whenua and other New Zealanders in the management of freshwater, and these principles inform this National Policy Statement and its implementation.”*

3.6.1.3 The six principles are:

- (a) Mana whakahaere: the power, authority, and obligations of tangata whenua to make decisions that maintain, protect, and sustain the health and well-being of, and their relationship with, freshwater;
- (b) Kaitiakitanga: the obligation of tangata whenua to preserve, restore, enhance, and sustainably use freshwater for the benefit of present and future generations;
- (c) Manaakitanga: the process by which tangata whenua show respect, generosity, and care for freshwater and for others;
- (d) Governance: the responsibility of those with authority for making decisions about freshwater to do so in a way that prioritises the health and well-being of freshwater now and into the future;
- (e) Stewardship: the obligation of all New Zealanders to manage freshwater in a way that ensures it sustains present and future generations;
- (f) Care and respect: the responsibility of all New Zealanders to care for freshwater in providing for the health of the nation.

3.6.1.4 The hierarchy of obligations in Te Mana o te Wai are:

- (a) first, the health and well-being of water bodies and freshwater ecosystems
- (b) second, the health needs of people (such as drinking water)
- (c) third, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.

3.6.1.5 The NPSFM contains the following objective and policies of relevance to the proposal:

**Objective 1** seeks to ensure that natural and physical resources are managed in a way that prioritises first, the health and well-being of water bodies and freshwater ecosystems, second, the health needs of people, third, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.

**Policy 1** *Freshwater is managed in a way that gives effect to Te Mana o te Wai.*

**Policy 2** *Tangata Whenua are actively involved in freshwater management and Māori freshwater values are identified and provided for.*

**Policy 3** *Freshwater is managed in an integrated way that considers the effects of the use and development of land on a whole-of-catchment basis, including the effects on receiving environments.*

**Policy 6** *There is no further loss of extent of natural inland wetlands, their values are protected, and their restoration is promoted.*

**Policy 8** *The significant values of outstanding water bodies are protected.*

**Policy 9** *The habitats of indigenous freshwater species are protected.*

**Policy 10** *The habitat of trout and salmon is protected, insofar as this is consistent with Policy 9.*

**Policy 11** *Freshwater is allocated and used efficiently, all existing over-allocation is phased out and future over-allocation avoided.*

**Policy 15** *Communities are enabled to provide for their social, economic, and cultural well-being in a way that is consistent with the NPSFM.*

**Comment**

I consider that the proposed activities are consistent with the objective and policies in the National Policy Statement for Freshwater Management. I consider that the mitigations proposed, such as constructing a wetland, building a herd home winter barn, reducing winter crop area below the permitted baseline and incorporating plantain into the re-grassing programme, would avoid and mitigate any potential adverse effects on water quality which is consistent with Policies 1, 3, 8, 9 and 10. The proposal includes the construction and enhancement of an existing wetland, which is consistent with Policy 6. The volume of water the applicant is seeking will not cause over-allocation and it is deemed an efficient use of water at 120 L/cow/day, which is consistent with Policy 11. Te Ao Marama Inc, on behalf of Waihōpai Rūnanga, has submitted on the application. Consideration of Te Tangi a Taura and the involvement of Te Ao Marama Inc is not considered inconsistent with Policy 2, but I do note the concerns of Waihōpai Rūnanga and its desire to be heard at hearing.

**3.8 Relevant provisions of National Environmental Standards and other regulations (Section 104(1)(b)(i) and (ii))**

**3.8.1 National Environmental Standard for Freshwater Management 2020**

3.8.1.1 Section 104 requires consideration of any NES that is relevant. In this case the, the National Environmental Standards for Freshwater Management need to be considered. These regulations set requirements for carrying out certain activities that pose risks to the health of freshwater and freshwater ecosystems and came into force on 3 September 2020.

3.8.1.2 Regulation 9 of the Resource Management (National Environmental Standards for Freshwater) Regulations 2020 is as follows:

*“The use of land on a farm for holding cattle in a feedlot is a permitted activity if it complies with the condition.*

...

Condition

*The condition is that 90% or more of the cattle held in the feedlot must-*

- (a) Be no more than 4 months old; or*
- (b) Weigh no more than 120 kg.”*

3.8.1.3 As the feed pad will be accommodating cattle older than 4 months old and heavier than 120kg the proposal moves to Regulation 10 which states:

*“The use of land on a farm for holding cattle in a feedlot is a discretionary activity if it-*

- (a) Does not comply with the condition in regulation 9(3); but*
- (b) Complies with the conditions in subclause (3) of this regulations.*

...

Conditions

*The conditions are that-*

- (a) The base of the feedlot must be sealed to a minimum permeability standard of  $10^{-9}$  m/s; and*
- (b) Effluent expelled in the feedlot must be collected, stored, and disposed of in accordance with a rule in a regional ... plan, or a resource consent; and*
- (c) The feedlot must be at least 50 m away from any water body, any water abstraction bore, any drain, and the coastal marine area.”*

3.8.1.4 Liquid effluent expelled on the feed pad is collected, stored in the pond and discharged as per a resource consent and the feed pad is not located within 50 m of any water body, abstraction bore, drain or the CMA. However, as the feed pad does not have a base sealed to a minimum permeability standard of  $10^{-9}$  m/s, the proposal triggers Regulation 11 which deems the use of land for holding cattle in a feedlot<sup>10</sup> a non-complying activity.

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<sup>10</sup> Defined in the NES-F as a stock holding area where cattle are kept for at least 80 days in any 6-month period and are fed exclusively by hand or machine.

3.8.1.5 Regulation 18 of the Resource Management (National Environmental Standards for Freshwater) Regulations 2020 is as follows:

*“The conversion of land on a farm to dairy farm land is a permitted activity if it complies with the applicable condition.*

...

Condition

*If the farm included dairy farm land at the close of 2 September 2020, the condition is that, at all times, the area of the farm that is dairy farm land must be no greater than-*

- (a) the area of dairy farm land at the close of 2 September 2020; plus*
- (b) 10 ha.”*

3.8.1.6 As the parcel of land being incorporated into the dairy farm is only 84.2 ha, the proposal triggers Regulation 19, which in turn means the proposal is subject to Regulation 24. Regulation 24 sets out conditions on granting resource consents for a discretionary activity which states they may only be granted if they will not result in an increase in contaminant loads in the catchment, or concentrations of contaminants in freshwater, compared with the loads, or concentrations, as at the close of 2 September 2020. It also stipulates the consent must expire before 1 January 2031.

### **3.8.2 National Environmental Standard for Sources of Human Drinking Water Regulations 2007**

3.8.2.1 This NES is relevant to any application for a discharge permit. These regulations aim to reduce the risk of drinking water sources being contaminated. Regulations 7 and 8 only apply to an activity that has the potential to affect a registered drinking-water supply that provides no fewer than 501 people with drinking water for not less than 60 days each calendar year.

3.8.2.2 The activity is 10 km upstream of a registered drinking-water supply that provides water to more than 501 people. The Invercargill City Council takes water from the Oreti River at Invercargill for >501 people with this being the key municipal supply for the Invercargill City population currently.

3.8.2.3 The activity is also upstream of two registered drinking-water supplies that provide water to less than 501 people. Woodlands School and Myross Bush School both supply drinking water for between 25 and 501 people. However, Woodlands School collects its source of drinking water from the roof and Myross Bush School abstracts from a bore but is located over 17 km downstream from the proposal site. Therefore, in my opinion the effects of the proposal on these drinking water supplies is less than minor.

3.8.2.4 Any potential effects on the water supply are likely to be negligible. The discharge is not directly to water and maintenance of buffer zones, along with other mitigation methods, will be required by consent conditions. Provided the conditions are adhered to, then the discharge is not likely to introduce or increase the concentrations of determinands at the drinking water abstraction point that would cause a breach of the standards.



### 3.8.3 Resource Management (Measurement and Reporting of Water Takes) Regulations 2010

- 3.8.3.1 Accurate, complete and current water information is a critical building block in establishing a water management system in which water is effectively allocated and efficiently used. The regulations apply to holders of water permits (resource consents) which allow fresh water to be taken at a rate of 5 L/s or more.
- 3.8.3.2 As the proposed take is less than 5 L/s then the regulations do not apply. However, if consent was granted metering would be required as a condition of consent to demonstrate compliance with the consent.

### 3.9 Any other matters considered relevant and reasonably necessary to determine the application (Section 104(1)(c))

#### 3.9.1 Te Tangi a Tauria

- 3.9.1.1 Te Tangi a Tauria is the Iwi Management Plan for Murihiku. This plan is recognised in Policy 1.2 of the Regional Policy Statement, and is included as a matter considered relevant and necessary under Section 104(1)(c) of the Resource Management Act 1991. Policies from Te Tangi a Tauria, which are relevant to this application, are:

#### Farm Effluent Management (Section 3.5.1)

- |                  |  |
|------------------|--|
| <i>Policy 2</i>  | <i>Ensure that Ngāi Tahu ki Murihiku are provided with the opportunity to participate in the development of appropriate consent conditions for discharge consents, including monitoring conditions.</i>                              |
| <i>Policy 4</i>  | <i>Sustain the life supporting capacity of soils for future generations.</i>   |
| <i>Policy 7</i>  | <i>Require soil risk assessments prior to consent for discharge to land, to assess the suitability and capability of the receiving environment. Effluent should be applied at rates that match the ability of land to absorb it.</i> |
| <i>Policy 8</i>  | <i>Require best practice for land application of managing farm effluent by using the methods listed in the full policy</i>   |
| <i>Policy 9</i>  | <i>Require that farm plans include the location of tile drains on farm to ensure that farm workers know where drains are when irrigating.</i>  |
| <i>Policy 11</i> | <i>Avoid any surface run-off/overland flow, ponding, or contamination of water resulting from the application of dairy shed effluent to pasture.</i>   |
| <i>Policy 13</i> | <i>Appropriate buffer zones between discharge activities and waterways.</i>  |
| <i>Policy 14</i> | <i>Buffer zones of at least 100m between discharge activities and bores.</i>   |
| <i>Policy 15</i> | <i>Manage and contain all spray drift from irrigation of effluent.</i>   |

### **Water Quality (Section 3.5.13)**

- Policy 5*            *Avoid the use of water as a receiving environment for the discharge of contaminants. Generally, all discharge must be first to land.*
- Policy 6*            *Avoid impacts on water as a result of inappropriate discharge to land activities.*
- Policy 9*            *Require the use of buffer zones, riparian areas, bunds and other mechanisms to prevent stormwater and other wastewater from entering waterways.*
- Policy 11*           *Require robust monitoring of discharge permits, to detect non-compliance with consent conditions. Non-compliance must result in appropriate enforcement action to discourage further non-compliance.*

### **Water Quantity - Abstractions (Section 3.5.14)**

- Policy 4*            *In the Southland Plains region, the preference is for water takes from bores as opposed to surface water.*
- Policy 16*           *Encourage the installation of appropriate measuring devices on all water abstractions.*
- Policy 17*           *Advocate for durations not exceeding 25 years on resource consents related to water abstractions.*
- Policy 18*           *Require, where necessary, a consent condition providing for a review of the volume able to be abstracted from the bores.*

### **Comment**

Issues raised by Te Ao Marama Inc in its submission include the current degraded state of water quality in the catchment and that the proposal will contribute further to this degradation. The applicant has had subsequent discussions with tangata whenua to explain the mitigations and measures the applicant would commit to, to understand concerns of Ngāi Tahu and to find a path forward in which mahinga kai and other cultural matters may be able to be addressed through the wetland proposal. As mentioned above, I am not a suitably qualified person with regard to cultural impact assessments, and this will be a matter to be addressed at the hearing. However, I have sought to assess the proposal against the direction in Te Tangi a Tauria as far as possible. The main discharge method of effluent is to land via a low rate travelling irrigator with other methods proposed as contingency measures, which is consistent with Farm Effluent Management Policies 4, 7, 8, 9 and water quality Policies 5 and 6. Conditions of consent relating to buffer distances, riparian planting, spray drift and ponding of effluent are included in the conditions of consent which is consistent with the Farm Effluent Management Policies 11, 13, 14, 15 and water quality Policy 9. The water take is from a bore, conditions relating to water meters and review of abstraction volume are also included in the water abstraction permit along with a consent duration of less than 25 years. Ngāi Tahu Murihiku has been involved in the application as Te Ao Marama Inc was considered an affected party. As a result, it has provided a submission, which is consistent with Policy 3.5.1.2. I note the Iwi Management Plan has very few policies relating to land use activities with regard to

dairy farm expansions and land intensification. This is presumably because Te Tangi a Tauria became operative in 2008 during the dairy boom in Southland.

### **3.10 Section 105 matters relevant to discharge or coastal permits**

3.10.1 Section 105 matters need to be considered as the application is for a discharge that would contravene Section 15. Under Section 105, the consent authority must have regard to:

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

3.10.2 The sensitivity of the receiving environment has been considered, being in particular the key risks to surface water quality through overland flow of contaminants and to groundwater quality through leaching of contaminants via deep draining soils. The main irrigation method is low rate discharge which is considered to be appropriate for the receiving environment. The proposal also includes discharge buffers to surface waterways and bores.

3.10.3 The alternatives considered by the applicant are summarised at paragraph 3.3.5 above. I have had regard to those alternative methods and receiving environments (discharge to water and "as required" discharge to land). I agree with the applicant that those alternatives would likely result in greater adverse effects. The application noted "*there are no other practicable environmentally acceptable alternatives to applying farm dairy effluent to land*".

### **3.11 Section 107 restriction on grant of certain discharge permits**

3.11.1 Section 107(1) states that a discharge permit should not be approved if, after reasonable mixing, the contaminant is likely to give rise to adverse effects.

3.11.2 With regard to s.107, the application noted "*There are no matters under Section 107(1) of the RMA that would require the consent authority to decline this application.*"

3.11.3 If carefully managed, the proposed effluent discharge is not expected to give rise to the effects on surface water listed in Section 107.

### **3.12 Part 2 of the Resource Management Act 1991**

3.12.1 All considerations are subject to Part 2 of the RMA, which sets out the purpose and principles that guide this legislation. Section 5 states the purpose of the RMA and Sections 6, 7 and 8 are principles intended to provide additional guidance as to the way in which the purpose is to be achieved.

3.12.2 The application of Section 5 involves consideration of a range of matters in assessing whether a proposal will promote the sustainable management of natural and physical resources. The enabling and managing functions found in s5(2) should be considered of equal importance and taken as a whole. Sections 6, 7 and 8 provide further context and guidance to the constraints found in s5(2) (a) (b) and (c). The commencing words to these sections differ, thereby establishing the relative weight to be given to each section.

3.12.3 In relation to the matters outlined in Section 5 I consider that this application is consistent with the purpose and the principles of the Act, as set out in Section 5. This is the promotion of the sustainable management of natural and physical resources. The proposed activities will have no more than minor adverse effects on the ability of the receiving environment to meet the reasonably foreseeable needs of future generations, or on the life-supporting capacity of the land or any ecosystem associated with it. Proposed consent conditions will ensure that any potential adverse effects of the activities will be avoided, remedied or mitigated.

3.12.4 All of the Part 6 matters have been covered within the various Council planning instruments, of which the application is generally consistent with. There is only one matter of national importance, as outlined in Section 6 of the Act, that needs to be recognised and provided for in the context of this application. This is the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, wāhi tapu and other taonga. However, the landholding is not part of Statutory Acknowledgment Area under the Ngāi Tahu Claims Settlement Act 1996 and there are no known areas of cultural importance within the site. Consideration has also been given, as per Section 104(1) to the relevant Iwi Management Plan for Southland. The following parts of Section 6 have been recognised and provided for, but do not have a direct relationship to the application because:

- the natural character of the coastal environment, wetland, rivers and lakes and their margins will not be developed, used or subdivided as part of this application;
- there are no identified Outstanding Natural Features and/or Outstanding Natural Landscapes within the area;
- there are no known areas of significant indigenous vegetation and significant habitats of indigenous fauna;
- the application does not relate to public access to and along the coastal marine area, lakes and/or rivers;
- there are no known sites of historic heritage within the farm and as such they will not be affected by inappropriate use, subdivision or development;
- the site is not within a Statutory Acknowledgment Area and is not part of any customary rights.

3.12.5 In relation to the considerations under Section 7, I consider that the activity would not be detrimental to the matters listed in Section 7 (a)–(j). In particular, the efficient use of and development of resources, the maintenance and enhancement of the quality of the environment and the protection of the habitat of trout and salmon. It is considered that, as the application is generally consistent with the various Council planning documents, the application is also generally consistent with the aforementioned Section 7 matters.

3.12.6 With regard to Section 8 of the Act, the principles of the Treaty of Waitangi have been taken into account. This is through the consideration of Te Tangi (Iwi Management Plan) and the relevant policies in other planning documents.

3.12.7 Overall, I consider that the application meets the relevant provisions of Part 2 of the RMA as the proposal achieves the purpose of the RMA which is the sustainable management of natural and physical resources.

## 4. Recommendations

### 4.1 Whether to grant

4.1.1 The application is considered to be a **non-complying activity** and as such may be declined or granted. When considering a non-complying activity, the Council may only, in accordance with Section 104D, grant a resource consent for the activity if it is satisfied that the adverse effects of the activity are minor or the application is for an activity that will not be contrary to the objectives and policies of the relevant plan or proposed plan.

4.1.2 I consider that it is appropriate to grant the application for the following reasons:

- the application is generally consistent with the objectives and policies of the relevant National Policy Statement, Regional Policy Statement and Regional Plans;
- any potential or actual adverse effects on the environment from the proposed activity are expected to be no more than minor if the mitigations are implemented correctly;
- the mitigations the applicant has offered will avoid, remedy or mitigate any actual adverse effects that do arise from the proposed activity; and
- the application passes both the “gateway” tests in Section 104D of the Resource Management Act.

4.1.3 The proposed dairy farm expansion activity has appropriate mitigation measures proposed by the applicant, including constructing a wetland, building a brand new herd home winter barn to house cows during adverse weather and incorporating plantain into their re-grassing programme. Recommended conditions of consent include implementing a soil testing regime, restrictions on intensive winter grazing, maintaining a Farm Environmental Management Plan and ensuring proposed mitigation measures are implemented to improve water quality.

4.1.4 Overall, I recommend, that for the above reasons, the application be granted pursuant to Sections 104B and 108 of the Resource Management Act 1991, subject to the consent conditions.

### 4.2 Term of consent

4.2.1 The applicant has requested a consent term of 10 years due to:

- the financial investment involved in gaining a consent of this nature;
- certainty that the proposed mitigations will address all potential adverse effects;
- consistency with the direction in Te Tangi a Taurira that consent terms should be less than 25 years; and
- The applicant’s good compliance history for the existing resource consents.

4.2.2 Policies 14A and 43 of the Regional Water Plan set out factors to consider specifically in relation to the term of water and discharge permits but not land use consents. Policy 40 of the proposed Southland Water and Land Plan has requirements for term and should be given greater weighting over the RWP policies.

4.2.3 Policy 40 requires that determination of the term includes:

- granting a shorter duration than that sought by the applicant when there is uncertainty regarding the nature, scale, duration, and frequency of adverse effects from the activity or the capacity of the resource;
- relevant tāngata whenua values and Ngāi Tahu indicators of health;
- the duration sought by the applicant and reasons for the duration sought;
- the permanence and economic life of any capital investment;
- the desirability of applying a common expiry date for water permits that allocate water from the same resource or land use and discharges that may affect the quality of the same resource;
- the applicant’s compliance with the conditions of any previous resource consent, and the applicant’s adoption, particularly voluntarily, of good management practices; and
- the timing of development of FMU sections of this plan, and whether granting a shorter or longer duration will better enable implementation of any revised frameworks established in those sections.

4.2.4 Following consideration of the policies above, I consider that the 10-year period requested is appropriate. I consider there is some uncertainty around the nature and extent of potential effects on freshwater quality in the long-term, particularly with regard to the assumed reduction in microbes (e.g. *E. coli*) and sediment losses to freshwater, and especially if all mitigations are not implemented in a timely manner. I have taken into consideration the imminent implementation of FMU limit setting and that if the FMU limit setting requires significant reductions in contaminants losses, a review would be necessary to implement those reductions. I have also considered the applicant’s significant investment in a herd home winter barn and associated new effluent storage as well as the generally good compliance history for the current discharge and water permits. Consequently, I recommend that the application is granted for a term of 10 years and all permits are given the common expiry date of 31 May 2032, to align with the end of the dairy milking season.



Jade McRae  
**Senior Consents Officer**

**Attached:** Discharge permit AUTH-20211092-01, Water permit AUTH-20211092-02, Land Use Consent AUTH-20211092-03, Land Use Consent AUTH-20211092-04 and Land Use Consent AUTH 20211092-05

RECOMMENDATIONS IN COUNCIL REPORTS ARE NOT TO BE CONSTRUED  
AS COUNCIL POLICY UNLESS ADOPTED BY COUNCIL

**Attachment 1**

**Irricon Resource Solutions  
Overseer Nutrient Budget  
Review Report on behalf of  
Council**



## **OVERSEER Nutrient Budget Review**

For: Environment Southland – Titipua Ltd Partnership

Prepared by: Nicky Watt, CNMA

Date: 2<sup>nd</sup> June 2021

[www.irricon.co.nz](http://www.irricon.co.nz)



## Introduction

1. Regarding the consent application for Titipua Ltd Partnership, I have reviewed the following OVERSEER<sup>®</sup> Nutrient Budget (OVERSEER) files:
  - a) Current Dairy Platform FINAL
  - b) Current Schrama block FINAL
  - c) Proposed FINAL
2. Along with the file I have reviewed the following accompany reports: OverseerFM farm system modelling to support a consent application for expanded dairy. Report prepared for Titipua Ltd Partnership prepared by Mo Topham, AgriAce Consulting Limited and reviewed by Lee Baldwin, Baldwin Agri Solutions. I have completed a robustness check on the file for sensibility based on data available and checked to ensure the modelling aligns with the OVERSEER Best Practice Data Input Standards for v6.3.5.
3. It must be assumed that the information provided in the OVERSEER files that the current farming system as modelled is a viable farming system, using actual stock and fertiliser inputs. Therefore, the actual and proposed scenario is also assumed to be appropriate for the location and climate.
4. A 'sensibility test' has been undertaken on the Titipua Ltd nutrient budgets with the following five output screens from OVERSEER forming the basis of the determination of the robustness of the nutrient budget:
  - a) Is the nutrient loss consistent with what you would expect for an operation of this type and soils in this location?
  - b) Does the summary of inputs and outputs make sense? Especially clover fixation and change in block pools?
  - c) Check the 'Other values' block reports for rainfall, drainage, and PAW.
  - d) Select the Scenario reports other values and check the production and stocking rate.
  - e) Select the pasture production in the scenario report and check pasture growth.
5. Answers to each of these five points will be provided further in this report and then a final determination of the robustness of the nutrient loss to water will be provided at the end of this report.

## OVERSEER AUDIT

### Appropriateness of the Overseer inputs

1. The Overseer FM file submitted and stated in paragraph 1 of this report has been reviewed for consistency between the files and appropriateness of the inputs regarding the farming systems and the Overseer Best Practice Data Input Standard (BPDIS).
2. I concur that there are no deviations from the BPDIS.

3. The Dairy model has 181.5 ha total area with 175 ha effective (163 ha in pasture and 12 ha in fodder beet rotated through 141.5 ha of rolling pasture blocks). The Schrama Model has 84.2 ha total area with 80.5 ha effective (75.1 ha in pasture and 5.4 ha in swedes rotated through all the pasture blocks). The Proposed model has 265.7 ha total area with 255.5 ha effective (243.5 ha in pasture and 12 ha in fodder beet rotated through 141.5 ha of rolling pasture blocks and 76.9 ha of Schrama blocks). The Dairy plus Schrama models have a revised stocking rate of 26.0 RSU/ha, compared to the Proposed model which has a RSU 27.2 RSU/ha or a 4.4% increase in RSU/ha (see Table 1 below).
4. Reviewing the NZ Dairy statistics for the 2019/2020 season, shows the average milk solids production on this property for the Dairy model at 411.7 kgMS/cow and 1301 kgMS/ha is respectively lower than the Southland Regional average of 418 kg MS/cow and higher than the Southland Regional average of 1133 kgMS/ha. The Proposed model at 410.3 kgMS/cow and 1045 kgMS/ha is respectively lower than the Southland Regional average of 418 kg MS/cow and lower than the Southland Regional average of 1133 kgMS/ha. The stocking rate for Dairy Model at 3.1 cows/ha is greater than the Southland average for the 2019/2020 season of 2.76 cows/ha (Invercargill). The stocking rate for Proposed Model at 2.5 cows/ha is less than the Southland average for the 2019/2020 season of 2.76 cows/ha (Invercargill).

5. Table 1: Summary of Production and stocking rate

	Dairy <sup>1</sup>	Schrama <sup>2</sup>	Dairy + Schrama	Proposed <sup>3</sup>
Total Ha	181.5	84.2	265.7	265.7
Effective Area (ha)	175	80.5	255.5	255.5
Effective Pasture Area (ha)	163	75.1	238.1	243.5
KgMS	212000	-	-	254400
MS kg/ha grazed	1301	-	-	1045
MS kg MS/cow	411.7	-	-	410.3
Total RSU	5459	1186	6645	6956
RSU/ha (effective area)	31.2	14.7	26.0	27.2
Dairy RSU	5301	-	5301	6485
Lactation Length	266	-		266
Cows/ha	3.1	-		2.5
Cows October	500	-		600
Cows June	315	-		480
Cows July	315	-		620
Replacement RSU	127	-	127	471
Replacement June	-	-		140
Beef RSU	31	-	31	-
Beef June	0	-		-
Sheep Nov	-	1773		-
Sheep RSU	-	1186	1186	-
N lost kg/ha/yr	62	21		48

<sup>1</sup>Current Dairy Platform FINAL

<sup>2</sup>Current Schrama block FINAL

<sup>3</sup>Proposed FINAL

6. There was 12 ha of fodder beet (crop rotation) in the Dairy Model, 5.4 ha swedes (crop rotation) in the Schrama model and 12 ha Fodder Beet (crop rotation) in the Proposed model (see Table 2 below)

Table 2: Crop Details

	Dairy	Schrama	Proposed
	Year 1	Reporting Year	-
Swedes (ha)	-	5.4	-
Swedes Yield (tDM/ha)	-	12	-
When Grazed	-	June to August	-
Grazed by	-	Sheep	-
Fodder Beet (ha)	12	-	12
Fodder Beet Yield (tDM/ha)	22	-	22
When Grazed	May to September	-	May to September
Grazed by	Dairy Cows	-	Dairy Cows

- Supplements imported to meet cow demand (see Table 3 below). Pasture silage has been made where there was a surplus of pasture.
- The Dairy + Schrama models had pasture growth calculated at 15.0 tDM/ha compared to 16.07 tDM/ha for the Proposed model (a 6.7 % increase in growth). The average N used during the Dairy + Schrama model was 119 kgN/ha onto non effluent pasture. The Proposed model is expected to drop the N applied to effluent area to 154 kgN/ha (a 35.6 % drop when compared to the dairy model) and 175 kgN/ha to the Non-Effluent area (a 32 % increase when compared to the Dairy model). There is expected to be 1.81 tDM/ha supplement imported and 1.78 tDM/ha silage harvested in the Proposed model compared to 2.57 tDM/ha supplement imported and 0.17 tDM/ha silage harvested in the Dairy + Schrama models (see Table 3 below).

Table 3: Supplements imported and Harvested

	Dairy	Schrama	Dairy + Schrama	Proposed
Supplements Imported (tDM)	613	-	613	440
Supplements Imported Effective Area (tDM/ha)	3.76	-	2.57	1.81
Silage Harvested (tDM)	41	-	41	433
Silage Harvested Pasture (tDM/ha)	0.25	-	0.17	1.78
Total Area (ha)	181.5	84.2	265.7	265.7
Effective Area (ha)	175	80.5	255.5	255.5
Effective Pasture Area (ha)	163	75.1	238.1	243.5
Peak Cows/ha	3.1	-	-	2.5
N Fertiliser applied non -effluent area(kgN/ha)	239	18	119	175
N Fertiliser applied effluent Area (kgN/ha)	239	-	239	154
Pasture Growth non-effluent area (tDM/ha)	16.76	-	-	16.07
Pasture Growth effluent area (tDM/ha)	16.76	-	-	16.07
Whole Farm Pasture Growth (tDM/ha/yr)	16.76	11.17	15.00	16.07

- Relative productivity is 'No difference between blocks' and 'Same ratio as animal intake' for all models.

#### Overseer Outputs

The N lost to water for the Dairy + Schrama models was 49.1 kgN/ha compared to 48 kgN/ha for the Proposed model (2.2 % reduction in N loss). The P loss for the Dairy + Schrama models was 2.4 kgP/ha compared to 2.3 kgP/ha for the Proposed model which is a 4.2 % reduction in P loss (see Table 5 below). It is assumed that the information provided in this farming system is modelled as a viable farming system, using actual stock and fertiliser inputs.

Table 5: OVERSEER outputs

Overseer v6.3.4	Dairy	Schrama	Dairy + Schrama	Proposed
N lost to water kg/ha/yr	62	21	49.1	48
Total N lost kg/farm	11315	1738	13053	12749
P lost kg/ha/yr	2.5	2.3	2.4	2.3
Total P lost kg/farm	455	190	645	615
Other sources – N	483	30	513	589
Other sources – P	94	9	103	114

## Change in block pools

10. The organic pool for N indicates the amount of N that is being either immobilized as seen by a 'positive' Organic pool N value or being mineralized as seen by a 'negative' Organic pool N value. N being immobilized is being used for increased biological activity and temporarily locked up. Once the microorganisms die the organic N in their cells is converted by mineralization and nitrification to plant available nitrate. It appears N is potentially being mineralized in all models (see Table 6 below).

11. The inorganic soil pool for P indicates the amount P that exceeds soil P maintenance as seen by a 'positive' inorganic soil P value or is less than the soil P maintenance requirements as seen by a 'negative' inorganic soil P value. Slightly above maintenance P was applied to all models (see Table 6a below).

Table 6: Change in block pool (N)

	Dairy	Schrama	Proposed
Organic Pool	121	24	102
Inorganic Mineral	0	0	0
Inorganic Soil Pool	8	10	6

Table 6a: Change in block pool (P)

	Dairy	Schrama	Proposed
Organic Pool	15	12	15
Inorganic Mineral	2	2	2
Inorganic Soil Pool	10	8	8

## Rain/clover N Fixation

All plants, including forage crops, need relatively large amounts of nitrogen for growth and development. Biological nitrogen fixation is the term used for a process in which nitrogen gas (N<sub>2</sub>) from the atmosphere is incorporated into the tissue of certain plants. Only a select group of plants can obtain N this way, with the help of soil microorganisms. Among forage plants, the group of plants known as legumes (predominantly Clover in NZ pastures) are well known for being able to obtain N from air N<sub>2</sub>. The OVERSEER Technical Manual – Characteristics of Pasture, April 2015 indicates that biological N fixation is based on total pasture production and includes the fertiliser induced reduction in N fixation.

12. The Biological fixation for the Dairy and Schrama models is 76 and 72 respectively compared to the Proposed model at 111 (see table 7 below).
13. The average N added to the Dairy + Schrama models is 160 kgN/ha to whole farm compared to 158 kgN/ha for the Proposed model (a 1.3 % drop in N used).
14. The increase in biological fixation in the Proposed model can be explained by the decrease in N fertiliser applied and the decrease in supplements imported and increase in pasture harvested.

Table 7: Biological fixation

	Dairy	Schrama	Dairy + Schrama	Proposed
Biological Fixation	76	72		111
Average N applied to whole farm kg/ha/yr	224 (239 to non-effluent and effluent pasture)	23 (18 to pasture)	160 (119 to non-effluent pasture)	158 (136-154 to effluent and 175 to non-effluent pasture)

#### Pasture Production

15. The average effluent N inputs for Dairy model was 28 kgN/ha from liquid effluent to 99.7 ha pasture. There was 23 kgN/ha from solids to 75.3 ha of Pasture (see table 8 below). The average effluent N inputs for Proposed model was 32 kgN/ha from liquid effluent to 99.7 ha pasture. There was 13 kgN/ha from solids to 159.8 ha of Pasture.
16. Fertiliser inputs of N, for dairy model, to effluent and non-effluent pasture was 239 kgN/ha. Fertiliser inputs of N, for Schrama model, to pasture was 18 kgN/ha. This equated to an average of 119 kgN/ha for the Dairy and Schrama models combined for non-effluent pasture. Fertiliser inputs of N, for Proposed model, to effluent area was mainly 154 kgN/ha and 175 kgN/ha to the non-effluent pasture.
17. Liquid effluent is applied on pasture block for Dairy and Proposed models was applied all year-round using a -12mm-24 mm' application depth. Solids effluent from pond is applied in December for Dairy and Proposed models.

Table 8: Pasture production and N inputs (fertiliser and effluent)

	Dairy	Schrama + Dairy	Proposed
Effluent Liquid Area (ha)	99.7		99.7
Effluent Solids Area (ha)	75.3		159.8
Pasture Growth (tDM/ha/yr)			
Effluent	16.76		16.07
Non-Effluent	16.76		16.07
Whole farm pasture average (tDM/ha/yr)	16.76	15.0	16.07
N Fertiliser inputs (kg/ha/yr)			
Effluent	239		154
Non-Effluent	239	119	175
N Effluent Inputs (kg/ha/yr)			
Effluent	28		32
Non-effluent (includes solids)	23		13
Total N Inputs (kgN/ha/yr)			
Effluent	267		188
Non-Effluent	262	119	168

18. The pasture production for all models has been modelled as varying based on topography, climate, and development status.
19. Fertiliser inputs of N are moderate to high (see Table 8).
20. It is assumed the Current Dairy and Current Schrama models represent the actual farm system with actual stock, crop area and fertiliser inputs, it is assumed that the pasture production is accurate and reasonable.
21. Long term pasture growth in Southland between 1979 and 2012 indicated that average pasture growth for newer pastures was 12.7T DM/ha/yr.
22. The pasture production for the Dairy + Schrama models was 15.0 kgDM/ha compared to 16.07 tDM/ha for the Proposed model which is respectively 15.3% and 21% higher than the Southland average.
23. Dairy + Schrama models: Allowing for the Overseer model assuming an average metabolisable energy (ME) value of 10.5 MJME/kgDM for pasture and South Island pastures have a ME value closer to 11 MJME/kgDM the models output of pasture growth would drop by 4.5%. Also, the Dairy and Schrama models have used actual data and have been rotating crops which means new pasture which can account for 15-20% improvement in pasture growth.
24. Proposed Model: What cannot be accounted for is the 6.7% increase in pasture harvest for the Proposed model when compared to the Dairy and Schrama models combined. The RSU for the Proposed model has increased, supplement imported has decreased and more silage is being made on farm with similar N fertiliser used per ha over the whole farm. Where will the extra growth come from?
25. The animal distribution is modelled as 'No difference between blocks' and 'Default Grazing Months'.

Mitigations Modelled

26. Reporting out lined the following: As described in the Nutrient Budget Report for Titipua Ltd prepared for Titipua Ltd by Mo Topham AgriAce Consulting Ltd, there are several mitigation measures indicated to mitigate N loss that have been included in the Proposed modelling. The below table details if the mitigation measures have been included in the proposed scenario and if they are accurately modelled.

Table 9: Mitigation option for proposed scenarios

A change in culling policy meaning culls leave the property earlier in the season	Yes, there was 1.5% culled Feb, 3% culled March and 0% culled in April in Dairy model versus 4.8% culled Feb, 5.2 % culled March and 5.5 % culled April in Proposed model
A reduction in imported feed	Yes, supplements imported have reduced from 2.57 tDM/ha in Dairy + Schrama models to 1.81 tDM/ha in the Proposed model.

Greater use of the calving pad in spring	No and yes. The percentage of animals on the calving pad has not changed, but with more cows in the Proposed model more cows will be on the calving pad
Reduction of nitrogen fertiliser use	Yes, however the reduction over the whole farm is only a 1.3% decrease (160 Dairy + Schrama compared to 158 kgN/ha for Proposed)
Larger area for spreading effluent solids	Yes, there is a 53% increase in area that receives solids in the Proposed model
Reducing Olsen P levels to 30	Yes, Olsen P levels have dropped from 34 to 30.

27. All mitigations have been modelled correctly.

28. It is important that these mitigation measures are measured and monitored as if they are not adhered to the N loss reductions proposed may not occur.

29. Some good management practices assumed in Overseer are maintain accurate and auditable records of annual farm inputs, outputs and management practices (Overseer output is only as good as the data entered); Fertiliser is being applied according to the Fertmark and Spreadmark Codes of Practice; Feed is stored to minimise leachate and soil damage; Compliant effluent systems as defined by DairyNZ; Stock exclusion from water ways; Irrigation efficiency greater than 80%; farm race and bridge/culvert nutrient runoff is directed to paddocks; grazing managed to minimise losses from critical source areas.

30. Overseer will account for bad practices such as nitrogen (N) applied that exceeds the plants' ability to absorb the excess N, application of N in the winter, high stocking rates, land left fallow between crops and irrigating high water application rates causing N drainage to name a few.

31. The Overseer modelling completed for Titipua Ltd does not have any of the 'Bad Practices' as suggested in paragraph 33 and it would be assumed the FEMP would cover any good management practices (not limited to) outlined in paragraph 32.

## CONCLUDING COMMENTS

Determination of the robustness of the nutrient loss to water

32. The questions below were described at Paragraph five of this report. Whilst these have been answered throughout this report, this section summarizes the answer to each question to make an overall conclusion about the robustness of the nutrient budgets.

*Is the N loss consistent with what you would expect for an operation of this type and soils in this location?*

33. Based on my experience, the N loss estimates are reasonably consistent with an operation of this scale and soil types present.

*Does the summary of inputs and outputs make sense? Especially clover fixation and change in block pools?*

34. The Biological fixation at 76 to 111 is expected with the moderate amount of N fertiliser applied.

35. The average N added to the Dairy + Schrama models is 160 kgN/ha to whole farm compared to 158 kgN/ha for the Proposed model (a 1.3 % drop in N used).

36. It is not apparent from reviewing the Overseer technical manuals or the nutrient budgets if the pasture production and N fertiliser use accounts for all the biological fixation.

*Check the 'Other values' block reports for rainfall, drainage, and PAW.*

37. The rainfall and soil information have been entered based on protocols for the location and soil type selected.

*Production and stocking rate*

38. The Dairy plus Schrama models have a revised stocking rate of 26.0 RSU/ha, compared to the Proposed model which has a RSU 27.2 RSU/ha or a 4.4% increase in RSU/ha.

39. Based on my experience as well as reviewing NZ Dairy statistics for the 2019/2020 season, shows the average milk solids production for the Dairy model at 411.7 kgMS/cow and 1301 kgMS/ha are respectively lower than the Southland Regional average of 418 kg MS/cow and higher than the Southland Regional average of 1133 kgMS/ha. The Proposed model at 410.3 kgMS/cow and 1045 kgMS/ha is respectively lower than the Southland Regional average of 418 kg MS/cow and lower than the Southland Regional average of 1133 kgMS/ha.

40. The stocking rate for Dairy Model at 3.1 cows/ha is greater than the Southland average for the 2019/2020 season of 2.76 cows/ha (Invercargill). The stocking rate for Proposed Model at 2.5 cows/ha is less than the Southland average for the 2019/2020 season of 2.76 cows/ha (Invercargill).

41. It is assumed that the Dairy and Schrama models are based on actual year end information.

*Select the pasture production in the scenario report and check pasture growth.*

42. Long term pasture growth in Southland between 1979 and 2012 indicated that average pasture growth for newer pastures was 12.7T DM/ha/yr.



43. The pasture production for the Dairy + Schrama models was 15.0 kgDM/ha compared to 16.07 tDM/ha for the Proposed model which is respectively 15.3% and 21% higher than the Southland average.
44. Dairy + Schrama Models: Allowing for the Overseer model assuming an average metabolisable energy (ME) value of 10.5 MJME/kgDM for pasture and South Island pastures have a ME value closer to 11 MJME/kgDM the models output of pasture growth would drop by 4.5%. Also, the Dairy and Schrama models have used actual data and have been rotating crops which means new pasture which can account for 15-20% improvement in pasture growth.
45. Proposed Model: What cannot be accounted for is the 6.7% increase in pasture harvest for the Proposed model when compared to the Dairy and Schrama models combined. The RSU for the Proposed model has increased, supplement imported has decreased and more silage is being made on farm with similar N fertiliser used per ha over the whole farm. Where will the extra growth come from?
46. I have assumed an adequate level of robustness around the Dairy and Schrama Models of actual Overseer Modelling as it is based on an actual farming system, and with that, I have assumed actual stock and fertiliser inputs used.
47. The data input protocols have been followed with no deviations. This leads to a high level of robustness for the relevant input data for example, climate, soils, and pasture type.

Based on the concerns raised regarding some of the inputs and outputs in the Proposed Overseer model, I consider that the robustness of the nutrient loss estimates for the Proposed model to be medium, this is due to the following:

- Provide an explanation how the higher pasture growth for the Proposed model can be achieved (when compared to the Dairy + Schrama models).

I consider the robustness of the nutrient loss estimates for the Dairy and Schrama models to be high.

References:

New Zealand Dairy Statistics 2019/2020. Produced by LIC and DairyNZ 2020.  
<https://www.dairynz.co.nz/publications/dairy-industry/new-zealand-dairy-statistics-2019-20/>

Overseer Definition of Terms, previously Technical Note 6. May 2016  
Overseer Technical Manual – Characteristics of Pasture, April 2015

Smith. L. C. 2012. Proceedings of the New Zealand Grassland Association 74: 147-152 (2012) *Long Term pasture growth patterns for Southland New Zealand: 1978-2012.* [www.grassland.org.nz/publications/nzgrassland\\_publication\\_2284.pdf](http://www.grassland.org.nz/publications/nzgrassland_publication_2284.pdf)

<https://www.dairynz.co.nz/media/5790163/average-pasture-growth-data-south-island-2018.pdf>

## **Attachment 2**

# **S92(1) Further Information Response**



**LANDPRO**

Make the most of your land

30 August 2021

Landpro Reference: 20554

Council Reference: App-20211092

Environment Southland  
Private Bag 90116  
**Invercargill, 9840**

Dear, Jade

**Re: Request for Further Information under Section 92(1) of the Resource Management Act 1991 –  
Application for Titipua Dairies Ltd**

In reference to your request for further information dated 9 June, please find outlined below our response to this request.

### 1 A visual inspection of the sludge beds and weeping wall.

The applicant has decided to renew their discharge and water permit together with their Rule 20 expansion application. The visual inspection results are found in Appendix C of this application, attached.

### 2 Confirmation of a leak detection system.

Pond design drawings are found in Appendix A of the attached application for the discharge and water permit renewal.

### 3 Updated DESC.

An updated DESC is found in Appendix B of the attached application for the discharge and water permit renewal.

0800 023 318  
13 Pinot Noir Drive  
PO Box 302  
Cromwell 9342  
Central Otago, NZ  
info@landpro.co.nz

[landpro.co.nz](http://landpro.co.nz)

#### 4 An application depth and rate test for the travelling irrigator.

The applicant is waiting for contracts to come to farm and test the travelling irrigator depth and rate. They are happy for this to be a consent condition to keep the process rolling.

#### 5 Confirmation all waterways are fenced with a 3m setback to exclude all stock from waterways.

Existing fencing on the dairy platform is between 1-1.5m setback from waterways. Fencing on the Scharma block is between 1-5m. As required by Regulations 9 and 11 of the Resource Management Stock Exclusion Regulations 2020 any new fencing will have a 3 metre setback. As per Schedule 1, Part 1 (1) existing fencing is exempt from these regulations.

#### 6 Confirmation the feed pad is a non-complying activity.

The feed pad is a non-complying activity under the National Environmental Standards for Freshwater Management 2020 as they are not able to comply with regulation 10(3)(a), i.e., the base of the feedlot is not sealed to a minimum permeability standard of  $10^{-9}$  m/s. The edges of the feedlot are nibbed and the feed lot is at a lower elevation to the surrounding land meaning that over flow is unlikely. The feedlot has a slight decline where effluent can make its way to the end of the feed pad where it is collected and pumped to the effluent pond. Regulation 10(3)(b) and 10(3)(c) are both met.

#### 7 Confirmation 12 ha is the largest area per year of crop the applicants will use during the life of the consent

The applicant confirms that 12ha is the largest area per year that they will have in crop for the lifetime of the consent.

## 8 An assessment against Policy 4 of the National Policy Statement for Freshwater in regard to an increase in GHG emissions.

Policy 4 of the National Policy Statement for Freshwater Management 2020 states: '*Freshwater is managed as part of New Zealand's integrated response to climate change.*

As part of this proposal it is estimated that there will be a 6.7% decrease in nitrogen losses and a 11.2% decrease in phosphorus. These decreases are estimated to contribute to an improvement in water quality.

He Waka Eke Noa requires that by the end of 2021, 25% of farms will know their green house gas emission amount. As part of this application the applicant has modelled their emissions and therefore is complying with this. As part of He Waka Eke Noa, the applicant will work towards reducing their green house gas emissions within appropriate timeframes, currently advice and requirements around this have not been released.

He Waka Eke Noa accounts for the agricultural emissions, methane and nitrous oxide. CO<sub>2</sub> is covered by the emissions trading scheme. The increase in CO<sub>2</sub> as part of this application will be accounted for under this, i.e. fuel used on farm etc, and the company supplying the fuel is responsible for this.

This application is consistent with Policy 4 of the NPS, there is a decrease in nitrogen and phosphorus losses, resulting in an increase in water quality. The applicant is compliant with He Waka Eke Noa, as they are part of the 25% of farms that know their emission output and as such are consistent with New Zealand's integrated response to climate change.

## 9 Confirmation a variation application will be submitted to include the feed pad effluent

Attached is an application for the renewal of the discharge and water permit. Including in the discharge permit renewal is the addition of the effluent from the feed pad.

## 10 Address concerns raised in the audit of the nutrient budget

Attached is a memo from Mo Topham outlining the concerns that were raised as part of the nutrient budget audit.

I trust that the information set out above satisfies the request for further information. However, if you have any further queries, please do not hesitate to contact me.

Kind Regards

*Matilda Ballinger*

Matilda Ballinger

Planner



**LANDPRO**

Make the most of your land

# **Resource Consent Application to Environment Southland**

To replace Discharge Permit AUTH- 301081-V1

and Water Permit AUTH-301082-V1

Prepared for Titipua Partnership Limited



**Prepared For**

Titipua Partnership Limited

**Prepared By**

Landpro Ltd

13 Pinot Noir Drive

PO Box 302

Cromwell

Tel +64 3 445 9905

## QUALITY INFORMATION

Reference: 20554 - Titipua Partnership Limited- Assessment of Environmental Effects  
Date: 30 August 2021  
Prepared by: Andrea Richardson  
Reviewed by: Matilda Ballinger  
Client Review:  
Version Number: FINAL

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- Appendix A: Original Effluent Pond Design Drawings
- Appendix B: Dairy Effluent Storage Calculations – Original and Current
- Appendix C: Visual Assessment Report
- Appendix D: Peer Review of Visual Assessment Report
- Appendix E: Map of Effluent Discharge Area

# 1. INTRODUCTION

## 1.1 Overview of proposal

Titipua Partnership Limited (the applicant) owns and operates a dairy farm located at 354 Hedgehope Block Road, Hedgehope, approximately 23 km northeast of Invercargill. The property currently operates as a 181.5 ha dairy farm.

The applicant holds discharge permit AUTH-301081-V1 which authorises the discharge of dairy effluent to land and water permit AUTH-301082-V1 authorises the taking of groundwater at this farm. These consents expire on 1 September 2022.

Effluent is collected at the dairy shed, yard and feed pad, and is stored in an effluent pond and sludge beds. The pond and sludge beds have recently passed a visual inspection to confirm there are no visible cracks, holes or defects that would allow effluent to leak from the effluent storage facility. The applicant has sufficient effluent storage in the pond and sludge beds, as per a recent Dairy Effluent Storage Calculation report. The amount of dairy shed effluent disposed of onto land does not exceed that from 600 cows. Effluent is discharged to approximately 100 ha of land via a low-rate cobra travelling irrigator (and/or other low-rate effluent irrigation system).

The existing water permit authorises groundwater abstraction from bore E46/1068 on the property at up to 72,000 L/day. No changes are sought to the existing effluent discharge area or rate of groundwater take.

This application seeks the following resource consents:

- replacement of discharge permit AUTH-301081-V1 for the discharge of dairy effluent to land, with a variation to add the discharge of feed pad effluent; and
- replacement of water permit AUTH-301082-V1 for the taking of groundwater for dairy operations and stock drinking water.

The applicant may continue to operate under the existing effluent discharge and water permits until the new consents are granted under s124 of the RMA.

The applicant has also lodged a consent application (APP-20211092) that seeks to use land for farming, to use land for dairy support and to use land for a feed pad. That application includes the applicant's Farm Environmental Management Plan and nutrient budget. That application covers the applicant's proposal to expand their existing dairy platform onto a neighbouring 84 ha block of land, known as the "Schrama Block", which is owned by the applicant. No farm dairy effluent will be discharged onto the Schrama Block.

## 1.2 The Applicant

**Applicant Address:** 354 Hedgehope Block Road  
Hedgehope, 9872

**Address for Service:** C/- Landpro Limited  
PO Box 302  
Cromwell 9342

## 1.3 Purpose of documentation

Under Section 88 of the Resource Management Act 1991 (the RMA), this report provides an assessment of the activities effects on the environment as required by Schedule 4 of the RMA.

## 2. DETAILS OF PROPOSAL

### 2.1 Location

The farm is located at 354 Hedgehope Block Road, Hedgehope, 23 km northeast of Invercargill, as shown in Figure 1 below. The farm is situated in the Titipua Stream catchment.

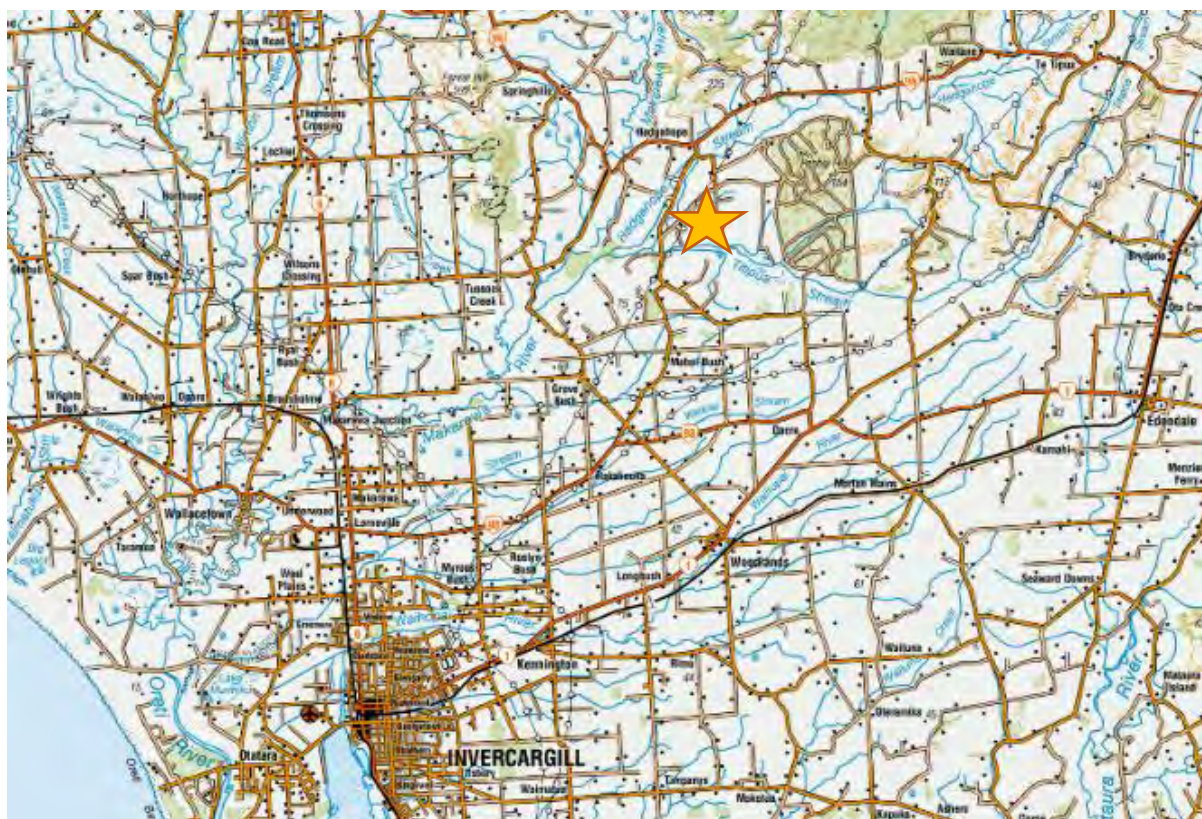


Figure 1: Location of property (Source: NZTopoMap).

### 2.2 General Property Details

Table 1: Land Use consent for Farming

Farm Details		
Farming Operation	Dairy	
Address	354 Hedgehope Block Road	
Property owner(s)	Titipua Partnership Limited	Titipua Partnership Limited
Legal Description	<u>Original Farm</u> Lot 2 DP 420431 Lot 1 DP 470872 Lot 3 DP 1494 Lots 1 and 2 DP 386399	<u>Schrama Block</u> Lot 1 DP 4406

	Lot 2 DP 4406	
Total Area	181.5 ha (dairy platform) + 84.2 ha (Schrama Block) = 265.7 ha total	

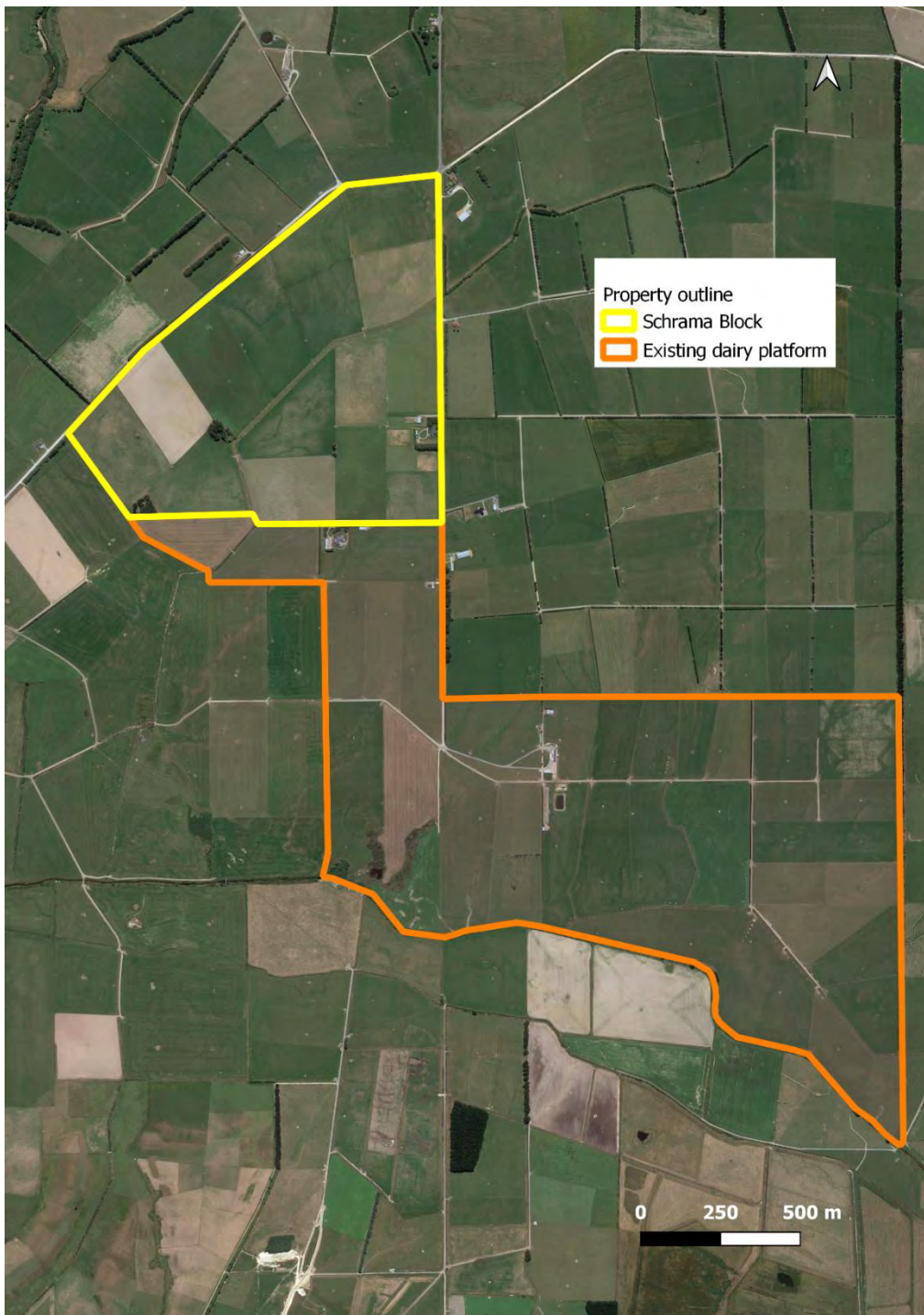


Figure 2: Map showing the extent of the existing dairy platform and the Schrama Block (Source: Beacon).



## 2.3 Details of Activities

This subject application seeks the following resource consents:

- replacement of discharge permit AUTH-301081-V1 for the discharge of dairy effluent, with the addition of the discharge of effluent from a feed pad; and
- replacement of water permit AUTH-301082-V1 for the taking of groundwater for dairy operations and stock drinking water.

As set out in the associated consent application APP-20211092, the applicant wishes to expand their existing 181.5 ha dairy platform onto a neighbouring 84.2 ha block of land, known as the "Schrama Block". That application seeks consent for the following:

- to use land for dairy farming (that did not exist as of May 2016);
- to use land as dairy support (Schrama Block);
- to convert land on farm to dairy farmland; and
- to use land for a feed pad/lot.

The applicant proposes to milk up to 600 cows across the new extended dairy platform. However, the effluent disposal area of approximately 100 ha will not increase from that consented under AUTH-301081-V1 and no effluent disposal will occur on the Schrama Block.

### 2.3.1 Discharge of dairy effluent

**Table 2: Effluent Storage and Discharge activities**

Discharge Permit Details	
Permit no.	AUTH-301081-V1
Number of dairy cows	600
Stocking rate (cows/ha)	3.3
Winter milking?	No milking between 20 June and 20 July other than slipped cows
Wintering barn?	No
Feed pad/standoff pad?	Yes - The feed pad is 110m x 13m, split into two pens.
Type of shed	44 aside herringbone shed
Effluent sources	Dairy shed, yard, feed pad
Greenwash	Yes – greenwash used at the dairy shed 40 L/cow/day
Effluent treatment	Weeping wall
Storage available	2,392 m <sup>3</sup>
Disposal area	99.7 ha
Irrigator proposed	Low-rate cobra travelling irrigator (and/or other low-rate irrigation system)
Application rate and depth	10mm/hr rate and 10mm depth per application

Monitoring	Soil moisture conditions assessed by reference to Environment Southland Beacon website before effluent application.
------------	---

Effluent at the dairy shed and yard gravity flows to two sludge beds. Nib walls and sumps allow full capture of effluent from the yard areas and shed platforms. The sludge beds are clay-lined, and in parallel, with parallel weeping walls that divide the beds. Having passed through the weeping walls, the filtered effluent is pumped to the effluent pond.

The pond is synthetically lined and includes a leakage detection system around the perimeter of the pond, as shown on the pond construction plans (refer Appendix A). The pond holds at least 2,320 m<sup>3</sup> of effluent, which is sufficient to contain the 90<sup>th</sup> percentile as determined by the Dairy Effluent Calculator Report (DESC), attached in Appendix B.

The pond and southern sludge bed have recently (16 June 2021) been visually assessed by a Suitably Qualified Person, Q Scandrett of Dairy Green Ltd, who confirmed that no visible cracks, holes or defects were evident that would allow effluent to leak from the effluent storage system. The pond's leak detection drainage was also identified and inspected during the visual inspection. The Visual Assessment report was peer reviewed by a Chartered Professional Engineer, Colin Macdiarmid of GeoSolve, who agreed with the conclusions reached and recommended that the northern sludge bed be inspected when emptied. The Visual Assessment report and peer review by Chartered Professional Engineer are contained in Appendices C and D, respectively.

The effluent disposal area is 99.7 ha. The filtered effluent is pumped from the pond on all suitable days and discharged to land via low-rate 'cobra' travelling irrigation system (and/or other low-rate effluent irrigation system). When the ground is at or near field capacity, there is enough buffer storage in the pond that irrigation is not required. The maximum application depth of 10 mm and instantaneous rate of application of 10 mm/hr is proposed to continue on farm.

The existing transfer pump at the weeping wall has a level sensor alarm system installed so that there is early warning of any problems prior to it overflowing. The effluent irrigation system has an automatic cut-off for pressure and flow abnormalities due to breakdown of the pipework or irrigators.

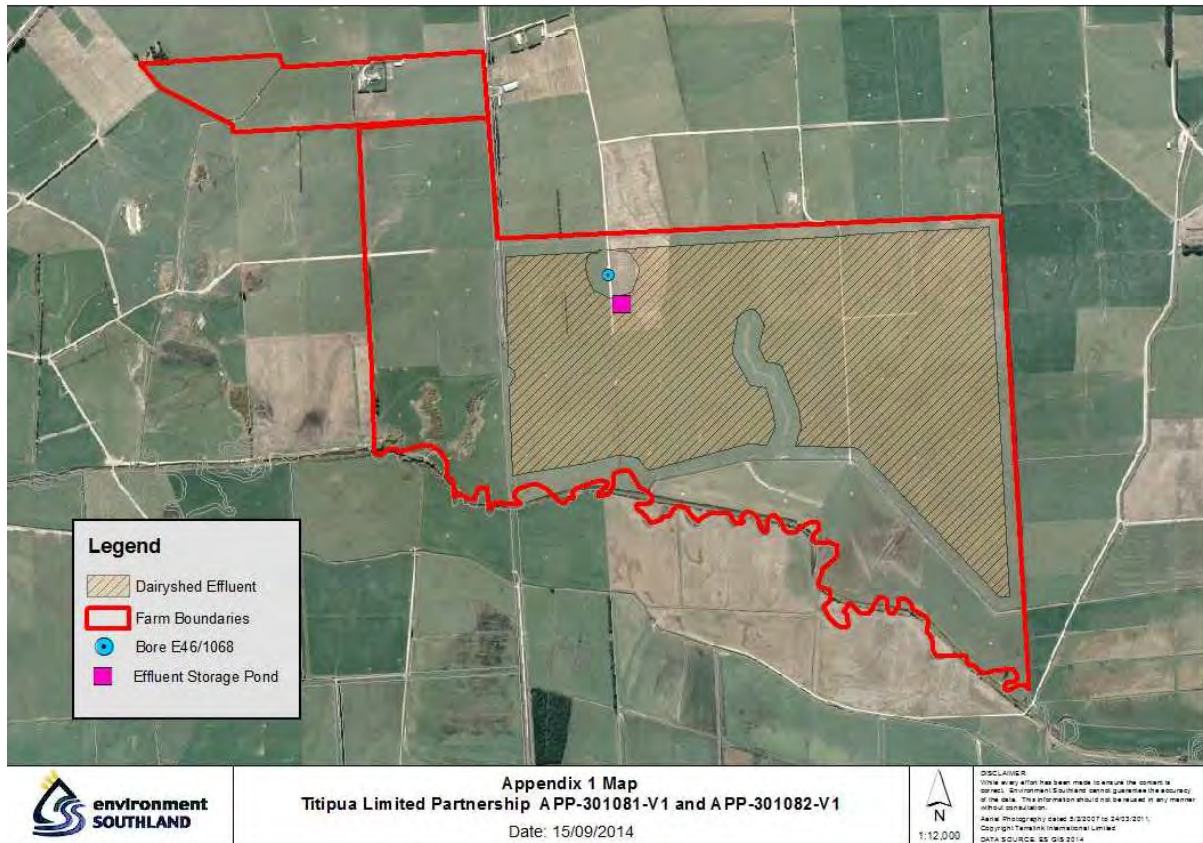
A feed pad is situated to the west of the effluent pond beside a shelter belt. The feed pad is 110m x 13m, split into two pens. A woodchip/bark base is used for bedding and cows are fed silage and hay. The feed pad is used in early spring and during adverse weather. The feed pad naturally slopes to the south and effluent is captured by drains in the pad and collected in a concrete tank. A pump transfers the effluent to the effluent storage pond. The feed pad is not used for more than 3 continuous months and is located approximately 300m from the nearest waterway. The feed pad is unlikely to receive overland flow from surrounding land, and all runoff and effluent from each feed pad is gravity fed directly to the effluent storage pond. Solid effluent is scraped from the feed pad and disposed to land.

Silage is stacked on a rock/limestone pad (30m x 14m) with earth banks on 3 sides. The stack is over 600m

from the Titipua Stream. Silage leachate and runoff from the silage stack does not discharge into the effluent storage system.



Figure 3: Layout of effluent system (source: Google Earth)



**Figure 4: Proposed effluent discharge area (as per Appendix 1 of existing consent APP-301081-V1)**

### 2.3.2 Take and use of groundwater

**Table 3: Summary of Water Take and Use details**

Water Permit Details	
Permit no.	AUTH-301082-V1
Bore	E46/1068, at or about NZTM 1257613E 4869560N
Freshwater Management Unit	Oreti
Groundwater Zone	Makarewa
Average rate of take over 24 hours	<2L/s
Daily volume	72,000 L/day
Allocation per cow	120 L/day
Yearly volume (m <sup>3</sup> /year)	26,280 m <sup>3</sup>
Discretionary allocation limit for groundwater zone (m <sup>3</sup> /year)	RWP – 49,065,000 m <sup>3</sup> PSWLP – 62,670,000 m <sup>3</sup>
Amount currently allocated from groundwater zone, including current permit (m <sup>3</sup> /year)	RWP – 4,004,891 m <sup>3</sup> PSWLP – 3,085,440 m <sup>3</sup> As of November 2020.

Groundwater for dairy shed operations and stock drinking water is pumped from a bore west of the dairy shed (Well E46/1068). The bore is capped and protected from stock or other sources of contamination, as

shown in the below photograph. The water take is metered, with volumes recorded each month as per the conditions of existing consent AUTH-301082-V1.



**Figure 5: Location of Bore E46/1068 in relation to Hedgehope Block Road (Source: ES Beacon)**



**Figure 6: Photograph of Bore E46/1068 (Source: Tiaki Farm Environment Plan)**

### **Compliance**

The applicant has demonstrated good compliance with their water permit AUTH-301082-V1 and discharge permit AUTH-301081-V1. Compliance commentary for AUTH-301081-V1 identifies a very tidy and well-maintained effluent system.

## **3. DESCRIPTION OF EXISTING ENVIRONMENT**

### **3.1 Land use and topography**

The property currently operates as a 181.5 ha dairy farm. The 84 ha Schrama Block was purchased by the applicant in 2020. The applicant proposes to incorporate the Schrama Block into their milking platform, milking up to 600 cows across the extended platform. An application for this expansion is currently with council.

The farm is generally 40 meters above sea level. The property is generally rolling with some flat areas.

### **3.2 Climate**

The area receives on average 1121-1130mm of rain per annum<sup>1</sup> and is in a moderately wet part of the Southland Region that experiences modest climate extremes with wet and dry conditions. Average temperature on the property is 10 degrees Celsius. The area experiences early frosts in April to May, with late frosts uncommon, although these can occur in early October.

### **3.3 Soils and physiographic zones**

#### **3.3.1 Soils**

Environment Southland's Beacon indicated that there are primarily Pukemutu soils across the dairy effluent discharge area. Makarewa and Titipua soils are located in the south-eastern tip of the discharge area.

**Table 4: Summary of Soils, Physiographic Zone(s) and Risks at the Mapped Discharge Area**

<b>Soil Characteristics</b>			
	<b>Vulnerability Factors</b>		
<b>Soil type</b>	<b>Structural compaction</b>	<b>Nutrient Leaching</b>	<b>Waterlogging</b>
Pukuemutu	Severe	Slight	Severe
Makarewa	Moderate	Slight	Severe

<sup>1</sup> As per the OverseerFM report attached to the applicant's associated land use consent application.

Titipua	Minimal	Slight	Severe
---------	---------	--------	--------

### **Pukemutu**

Typically, a heavy silt loam, increasing to silty clay in the lower subsoil. Pukemutu soils have a moderately deep potential rooting depth that is severely restricted by the fragipan at 60-90cm depth. This fragipan means that there is typically a moderately high to high plant available water. There is typically poor drainage, very slow permeability in the subsoil and limited aeration during sustained wet periods. The structural compaction and water logging vulnerability is severe, and the nutrient leaching vulnerability is slight.

### **Makarewa**

Texture of Makarewa soils is variable with layered texture profiles common, there is always at least one horizon with silty clay texture. The soils have poor drainage, slow subsoil permeability and may have poor aeration during wet periods. They have a deep rooting depth and moderately high available soil water. Structural compaction vulnerability is moderate, nutrient leaching vulnerability is slight and waterlogging vulnerability is severe.

### **Titipua**

A silt loam to silty clay soil. Titipua soils have poor drainage and slow subsoil permeability. They have a deep rooting depth and very high available soil water. There may be limited aeration during wet periods. The structural compaction vulnerability and the nutrient leaching vulnerability is minimal/slight, and the waterlogging vulnerability is severe.

## **3.3.2 Physiographic zones**

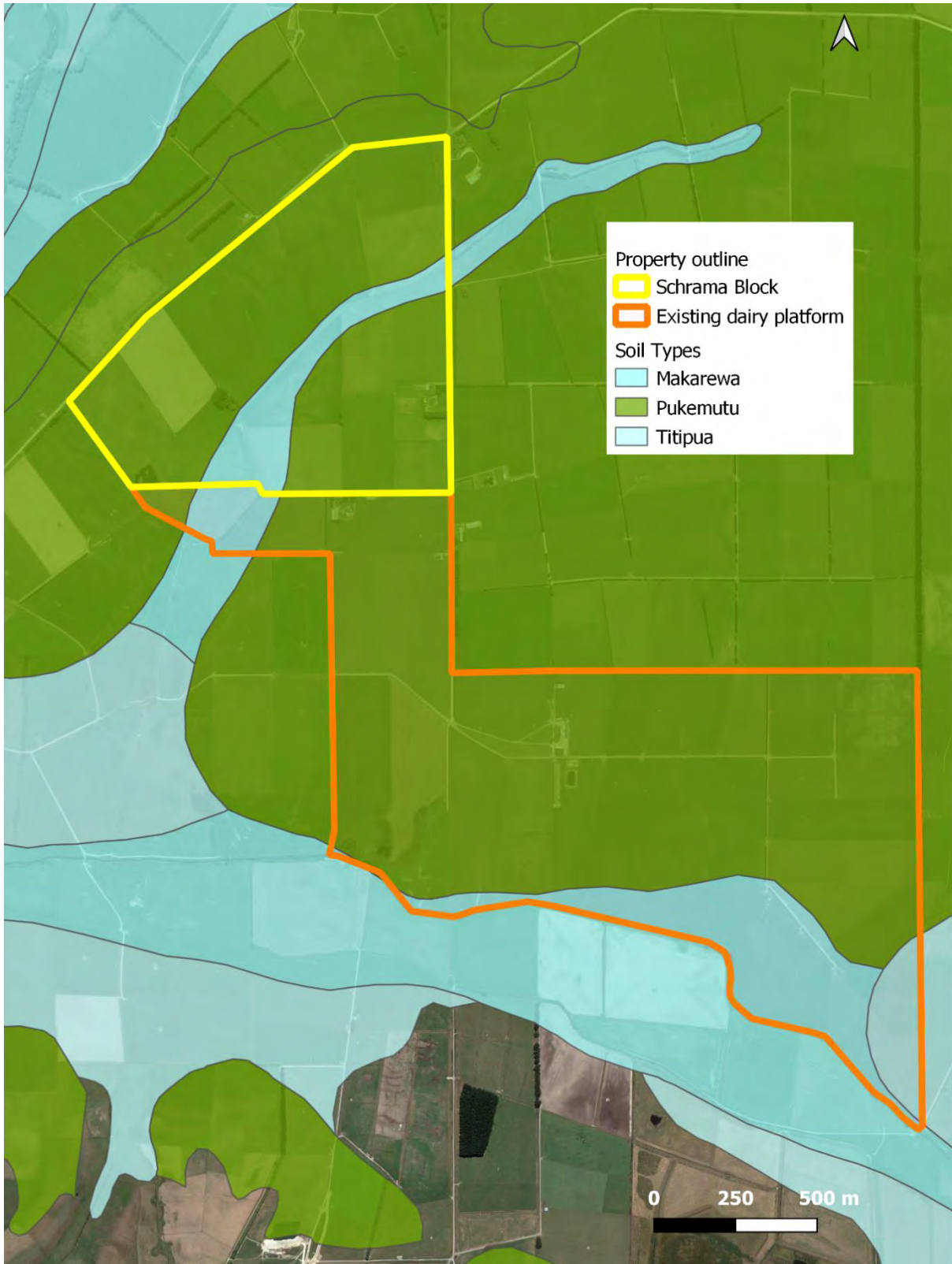
The proposed dairy effluent discharge area (refer to the mapped area in Appendix E) occurs within the Lignite/Marine Terraces and the Peat Wetlands Physiographic Zones.<sup>2</sup>

**The Lignite/Marine Terraces** physiographic zone comprises predominantly low elevation land, flat to gently undulating, where the geology has high organic content which has a strong influence over groundwater quality. This zone can have high denitrifying potential in groundwater in areas close to organic carbon sediments. Overland flow is common in this zone in areas that are poorly drained and sloping.

**Peat Wetlands** physiographic zone comprise predominantly low-lying flat land. This zone is characterised by soils which have extremely acidic soils which are prone to waterlogging. Often there is a seasonal water table that sits close to the ground surface resulting in seasonal ponding and overland flow to nearby streams. There is a high soil and aquifer denitrification potential in this zone.

---

<sup>2</sup> Environment Southland Physiographic Zone Fact Sheets (2015).



**Figure 7: Soil types on the property, noting that the effluent discharge only occurs within a portion of the existing dairy platform to the east of Hedgehope Block Road and not within the Schrama Block (Source: S-Map).**



### 3.3.3 Farm Dairy Effluent Classification

**Table 5: Minimum Management Criteria for land applied effluent systems to achieve**

	Category A	Category B	Category C	Category D	Category E
Soil and landscape feature	Artificial drainage or coarse soil structure	Impeded drainage or low infiltration rate	Sloping land (>7°)	Well drained flat land (<7°)	Other well drained but very stony <sup>X</sup> flat land (<7°)
Application depth (mm)	< SWD <sup>*</sup>	< SWD	< SWD	< 50% of PAW <sup>#</sup>	≤ 10 mm & < 50% of PAW <sup>#</sup>
Instantaneous application rate (mm/hr)	N/A <sup>**</sup>	N/A <sup>**</sup>	< soil infiltration rate	N/A	N/A
Average application rate (mm/hr)	< soil infiltration rate	< soil infiltration rate	< soil infiltration rate	< soil infiltration rate	< soil infiltration rate
Storage requirement	Apply only when SWD exists	Apply only when SWD exists	Apply only when SWD exists	24 hours drainage post saturation	24 hours drainage post saturation
Maximum N load	150 kg N/ha/yr	150 kg N/ha/yr	150 kg N/ha/yr	150 kg N/ha/yr	150 kg N/ha/yr

\* SWD = soil water deficit (The amount of water (mm) required to restore a soil to field capacity from its current moisture status)

# PAW = Plant available water (The state of top 300mm of soil after rapid drainage has effectively ceased and the soil water content has become relatively stable)

<sup>X</sup>Very stony= soils with > 35% stone content in the top 200 mm of soil

\*\* N/A = Not an essential criteria, however level of risk and management is lowered if using low application rates

Environment Southland's Beacon indicated that the effluent disposal area is primarily on soil/landscape category C (sloping land > 7 degrees), as identified on Map 1 of Appendix N of the RWPS. The soil/landscape at the south-eastern tip of the effluent discharge area is mapped as category A (artificial drainage or coarse soil structure). As per Table 1 of Policy 42 of the Regional Water Plan for Southland, the recommended depth of effluent application for soil/landscape categories A and C is less than soil water deficit.

## 3.4 Water resources

### 3.4.1 Groundwater

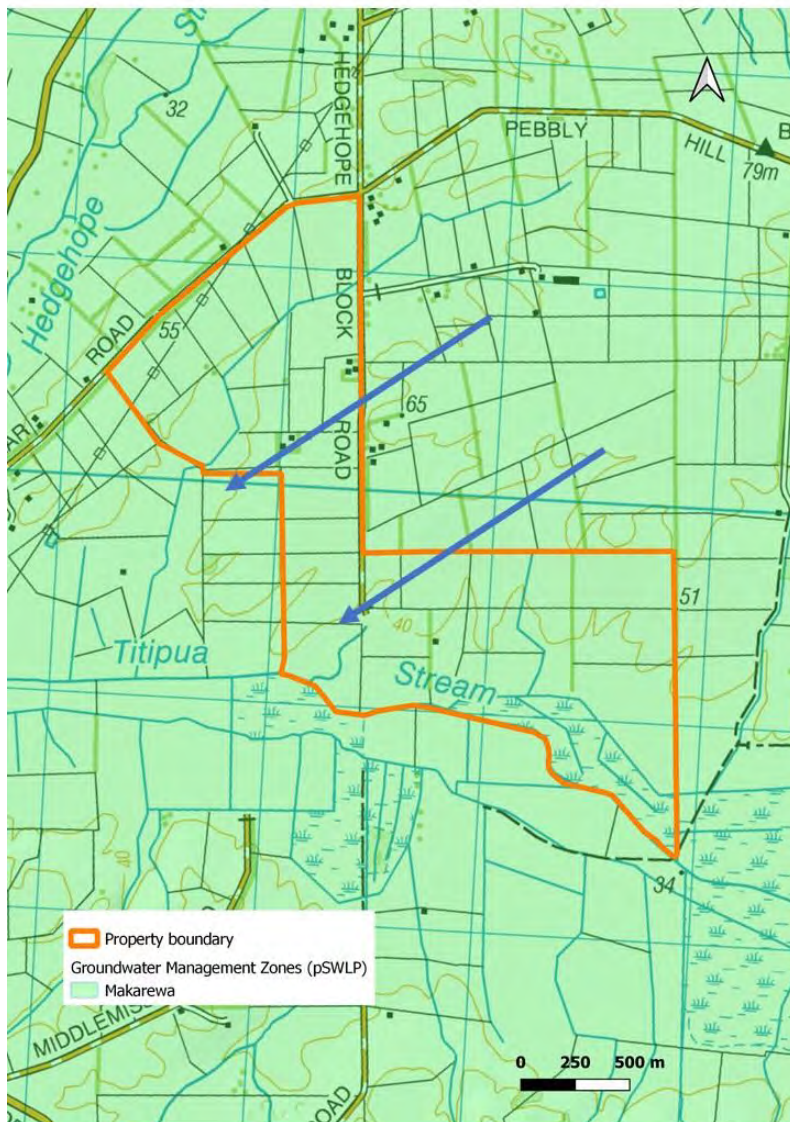
The property is within the Makarewa Groundwater Management Zone (GMZ). According to Environment Southland GMZ Factsheet, the typical properties of the Makarewa GMZ are as follows<sup>3</sup>:

- The zone has an area of 66,000 ha and typical depth to water of 2m – 10 m;
- Groundwater flow direction generally occurs obliquely to individual hydraulically connected surface waterways.

<sup>3</sup> <https://www.es.govt.nz/environment/water/groundwater/groundwater-management-zones/makarewa> (accessed 16/07/2021)

- The zone has a low water allocation status, indicating it is plentiful.
- The majority of recharge is infiltration of local rainfall. Average annual rainfall recharge is estimated at 272 mm /year.
- Groundwater quality in this zone may be compromised by elevated nitrate and microbial contamination levels in some locations.

The figure below shows the estimated groundwater flow direction. Topographic contours show the southern and western end of the property being lower elevation than the northern proportion of the property. This indicates that if following general topographic gradient, groundwater flow would be towards the south-west. This is consistent with the information above.



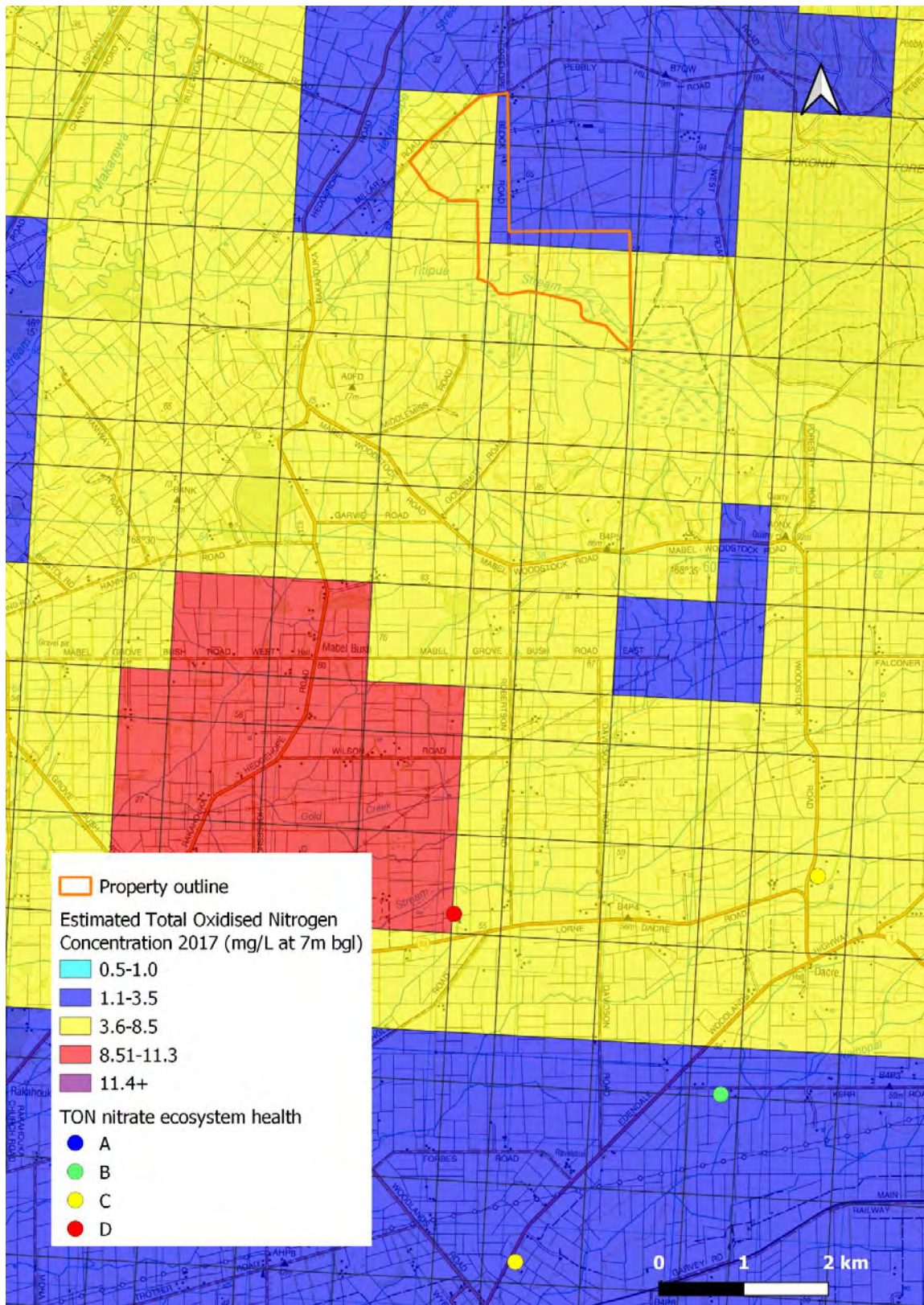
**Figure 8: Estimated groundwater flow direction (purple arrows), noting that the effluent discharge area is to the east of Hedgehope Block Road.**

Data from Environment Southland's Beacon shows that the estimated total oxidised nitrogen (TON) concentration under the effluent discharge area varies between 3.2 and 5.0 mg/L. The TON estimates are higher at the west and south of the property, and again higher piezometrically down-gradient (in the south-western direction). Further groundwater data from Environment Southland monitoring bores show that the groundwater data to the south of the property being of varying quality, ranging from NOF band A to NOF band D. There is an area of elevated nitrogen levels (up to 9.5 mg/L approximately 7 km south-west of the effluent discharge area).

There is water quality monitoring data from around 25 bores on neighbouring properties within a 5km radius of the applicant's existing bore E46/1068. This groundwater quality monitoring data indicates that overall groundwater quality meets the Maximum Acceptable Value (MAV) for *E. coli* in the New Zealand drinking water standards (less than one in 100 mL of sample). For nitrate nitrogen, the concentrations range from 0.01 to 6.61 g/m<sup>3</sup> (= mg/L), although noting that the second highest reading was 2.53 g/m<sup>3</sup>. The MAV for nitrate (as the nitrate ion) in drinking water is 50 mg/L to prevent against short-term health risk to bottle-fed babies, and when expressed as nitrate nitrogen, the MAV is equivalent to 11.3 mg/L. This means that groundwater quality is generally good in the vicinity of the applicant's effluent discharge area.

Of the bores piezometrically down-gradient of the effluent discharge area, only one is recorded as being used for domestic water supply, which is bore E46/0190 (47 m deep) located over 4 km south-west of the effluent discharge area.

The closest registered drinking water supply site sourced from groundwater that is piezometrically down-gradient of the effluent discharge area is Myross Bush School. This site is approximately 18 km south-west of the property, supplies water to 25-501 people and is in the Waihopai Groundwater Zone. There are no down-gradient community drinking water supply sites in the Makarewa GMZ.



**Figure 9: Modelled TON groundwater concentrations from ES data. Background shows estimated total oxidised nitrogen concentrations with coloured dots showing TON nitrate ecosystem health as measured from monitoring bores.**

### 3.4.2 Surface waterways

One unnamed tributary of the Titipua Stream runs through the effluent discharge area and the Titipua Stream flows along the southern boundary of the farm. There is a second tributary immediately to the west of the discharge area. The tributaries predominantly flow in a north-south direction with the Titipua Stream flowing from east to west. All waterways on the existing dairy platform are fenced and have grassed buffers.

The Titipua Stream joins the Hedgehope Stream, and latterly the Makarewa River approximately 8.5 km south west of the property. The Makarewa River joins the Oreti River which discharges into the New River Estuary approximately 30km downstream of the property boundary. This estuary drains several coastal catchments including the Makarewa Catchment.

There are two registered drinking water supply sites sourced from surface water downstream of the property, which is important for understanding the potential effects of a land use change on human health. Drinking water is supplied to Alliance Group - Makarewa Processing Plant and Alliance Group – Lorneville Processing Plant from the Makarewa River, approximately 20km and 27km respectively downstream of the property. The Alliance Makarewa site supplies water to 25-501 people, and the Alliance Lorneville site supplies water to >501 people.

### 3.4.3 Surface water quality

The following tables provide summary information on indicative surface water quality downstream of the property. There is no surface water quality data upstream of the property.

The water quality data has been sourced from the LAWA (Land and Water Aotearoa) website. LAWA is the most up to date national database which connects people with New Zealand's environmental monitoring data, enabling communities to access information relating to the different pressures and conditions on freshwater resources. The state of water quality presented on the LAWA website compares the median of monitoring results for the last five years at a site with other sites around the country. The median for a site can be compared to all other sites with a similar land use and altitude. The data used to calculate trends is the same as used for the regional state. LAWA displays regional trends for the last five to ten years which helps to identify whether a site has improved, degraded or stayed the same. The state of water quality is assessed against the objectives within the NPSFM 2020.

The table below provide a summary of the state and trend of Hedgehope Stream 20m upstream of the confluence with the Makarewa River (approximately 8.5 km downstream of the effluent discharge area).

**Table 6: Water quality data for Hedgehope Stream at the Makarewa River confluence**

Variable	State (compared to all lowland rural sites)	LAWA National Objective Framework Band/Attribute State 5-year median (2015-2019)	NOF Trend (5 year); and National Policy Statement for Freshwater (NPSFM 2020) national bottom line.
<i>E. Coli</i>	In the worst 25% of all sites	E – For more than 30% of the time the estimated risk is $\geq 50$ in 10000 (5% risk). 5yr Median: 580 n/100ml	Trend: Likely improving. NPSFM 2020: does not meet national bottom line for 5-yr median for primary contact sites.
Clarity (black disc)	In the worst 25% of all sites	5yr Median: 0.885 metres	Trend: Very likely improving. NPSFM 2020: uncertain – depends on suspended sediment class.
Total Oxidised Nitrogen	In the worst 50% of all sites	5yr Median: 0.62 g/m <sup>3</sup>	Trend: Likely Degrading NPSFM 2020: meets NBL for total nitrogen (trophic state).
Ammoniacal N	In the worst 25% of all sites	B - 95% species protection level. Starts impacting occasionally on the 5% most sensitive species 5yr Median: 0.0185 g/m <sup>3</sup>	Trend: not assessed NPSFM 2020: meets national bottom line.
Dissolved Reactive Phosphorus (DRP)	In the best 50% of all sites	C- Moderate DRP elevation about natural reference conditions 5yr Median: 0.0105 g/m <sup>3</sup>	Trend: Very likely improving NPSFM 2020: meets numeric attribute state for C <sup>1</sup> band status. There is no NPSFM 2020 NBL for this attribute.

<sup>1</sup>Ecological communities impacted by substantial DRP elevation above natural reference conditions. In combination with other conditions favouring eutrophication, DRP enrichment drives excessive primary production and significant changes in macroinvertebrates and fish communities, as taxa sensitive to hypoxia are lost.

The water quality trends indicate that the overall water quality in Hedgehope Stream has raised concentrations of various contaminants. Trend indicators have not been assessed over a ten year period to determine whether there are improvements in water quality or not, and are variable for the five year period.

With regards to the National Policy Statement for Freshwater (2020), for the variables assessed, clarity, TON and ammoniacal nitrogen meet the national bottom line (NBL) attribute state for attributes requiring limits. *E. Coli* likely does not meet the NBL for primary contact sites, noting that there is no NBL for this attribute beyond primary contact sites. Dissolved reactive phosphorus meets C band attribute status for variables that require action plans.

### 3.4.4 Estuary

The Makarewa River joins the Oreti River which discharges into the New River Estuary approximately 30km downstream of the property boundary. This estuary drains several coastal catchments including the Makarewa Catchment.

The New River Estuary is a 'tidal lagoon' type estuary, and is the largest estuary in Southland, being about 4,100 ha in size. The wetlands adjoining the New River Estuary and the Seaward Moss wetlands that flow into the New River Estuary are listed in Appendix A of the PSWLP as 'Regionally Significant Wetlands and Sensitive Water Bodies in Southland' and are similarly listed in Appendix B of the RWPS.

The estuary has been significantly affected by urban and rural development over the past 150 years. This includes large areas of reclaimed land, urban discharges including treated sewage and untreated stormwater, past landfill leaching, and agricultural activities and run-off further up the catchment. Nuisance blooms of macroalgae, failure to meet faecal bacterial guidelines in regard to swimming and gathering shellfish, and sedimentation problems are common within the estuary. As a consequence of the much reduced saltmarsh area, the estuary is more vulnerable to issues of eutrophication and sedimentation (given that saltmarsh acts to reduce nutrient and sediment impacts).<sup>4</sup>

Section 3.8 in the Regional Coastal Plan describes the key values for the New River Estuary. In summary, the key values are the exceptional bird and waterfowl habitat, recreational, shellfish gathering and heritage values which can be adversely affected by excessive levels of microbes, sediment and nutrients. The New River Estuary is listed in Appendix Q of the PSWLP as a sensitive waterbody.

Long-term estuary monitoring is undertaken for New River Estuary. The 'New River Estuary Macroalgal Monitoring 2018'<sup>5</sup> report combined with the 'New River Estuary Review of Water Quality data' report<sup>6</sup> show that regions of the upper estuary are under stress and showing eutrophication. There is excessive macroalgal growth including sediment quality decline and high concentrations of chlorophyll-a in the water column. Chlorophyll-a was used as an indicator of eutrophic conditions in the water column, and is a colour pigment present in many types of algae that can give an indication of how much algae is present in the water column.

The more recent (Dec 2019) Environment Southland report 'Current Environmental State and the "Gap" to Draft Freshwater Objectives for Southland' states that New River Estuary is currently receiving nutrient and sediment inputs beyond its assimilative capacity. The estuary is showing signs of eutrophication and

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<sup>4</sup> <https://www.es.govt.nz/environment/water/estuaries/estuaries-in-the-oreti>

<sup>5</sup> Stevens, L.M. 2018. New River Estuary: 2018 Macroalgal Monitoring. Report prepared by Wriggle Coastal Management for Environment Southland.

<sup>6</sup> Robertson, B.M., Stevens, L.M., and Dudley, B. 2017. New River Estuary - review of water quality data in relation to eutrophication 1991-2015. Report prepared by NIWA and Wriggle Coastal Management for Environment Southland.

expansive degraded areas, as indicated by areas currently in D band state for macroalgae, Gross Eutrophic Zone, mud content and extent, and sediment oxygen levels. A reduction in nutrient and sediment inputs would be needed to avoid further deterioration and achieve C band or better consistently to improve all these attributes above D band at all monitoring sites in this estuary.

Eutrophication occurs when nutrients in streams, rivers, lakes and estuaries cause excessive growth of aquatic plants and algae (primary producers). This excessive growth can impact the ecological health, recreational and food-gathering value of the affected water bodies. Run-off from productive land use is a leading cause of nutrient input to water bodies, and subsequent eutrophication.

The table below summarises the agricultural source loads of nitrogen and phosphorus as estimated by Aqualinc<sup>7</sup> in 2014. For agricultural source loads of nitrogen in the New River Estuary catchment, dairy farming contributes 52% of the total load, whilst sheep and beef farming (including wintering-off of dairy cows) contributes 48%. For phosphorus, dairy farming contributes 67% of the total load in the catchment, whilst sheep and beef farming contributes 32% and forestry contributes 1%.

**Table 7: Summary agricultural source loads for New River Estuary (source: Aqualinc 2014 report)**

Catchment agricultural source load (t/year)		Total catchment source nitrogen load (including from non-agricultural land) (t/year)	Estimated realised nitrogen loads (based on water quality monitoring data) (t/year)	Estimated attenuation (i.e. amount by which source load reduced in the environment) (%)
Nitrogen	Phosphorus			
4,969	139	5,513	3,718	33

## 4. ACTIVITY CLASSIFICATION

We have carefully considered all the applicable regional rules and national regulations that are relevant to the activities proposed by the applicants that are relevant to these effluent discharge and groundwater take activities.

### 4.1 Consents required

The applicant holds discharge permit AUTH-301081-V1 which authorises the discharge of dairy effluent to land and water permit AUTH-301082-V1 authorises the taking of groundwater at this farm. These consents expire on 1 September 2022. This proposal does not seek to increase the milked herd from which effluent

<sup>7</sup> Aqualinc (2014). Assessment of farm mitigation options and land use change on catchment nutrient contamination loads in the Southland region. Report number C13055/04.



will be collected, or stock drinking or washdown water requirements from that authorised in these consents. The applicant seeks to replace these permits and to also include feed pad effluent in the sources of effluent that will be discharged to land.

The following resource consents are required under the Regional Water Plan for Southland, 2010 (RWPS) and Proposed Southland Water and Land Plan, 2018 (PSWLP). Many of the Rules in the PSWLP are under appeal.

**Table 8: Applicable Rules**

Consent	Plan	Rule	Activity Status
Discharge Permit to discharge agricultural effluent to land	RWPS	50(e)	Discretionary
	PSWLP	35(b)	Restricted discretionary
Water Permit to abstract groundwater for dairy shed wash down and stock drinking	RWPS	23(d)(ii)	Discretionary
	PSWLP	54(a)	Permitted

***Discharge permit for discharge of effluent to land***

Effluent disposal occurs on soil/landscape categories A and C, as identified on Map 1 of Appendix N of the RWPS, and first commenced sometime after 17 July 2010 (source: google earth historic imagery). The discharge to land is via a 'low-rate irrigation' system as defined in the RWPS, as the maximum instantaneous rate of effluent application is 10 mm/hr in accordance with the current effluent discharge permit AUTH-301081-V1. The discharge of dairy effluent to land is therefore a **discretionary activity** under the RWPS Rule 50(e).

The discharge is a **restricted discretionary activity** under Rule 35(b) of the PSWLP, as it is a replacement of the existing discharge permit AUTH-301081-V1, and the maximum number of dairy cows from which the effluent is collected is specified in that permit, is not increasing (i.e., 600 cows).

***Water permit to abstract groundwater for dairy use and stock drinking water***

The take is from the Makarewa Groundwater Management Zone, which is a lowland aquifer as identified on Groundwater Map 9 of Appendix D of the RWPS. The rate of abstraction for dairy operations and stock drinking water will not exceed 72 m<sup>3</sup> per day and the rate of take is less than or equal to 2L/s.

The abstraction and use of groundwater from a lowland aquifer where the total volume of water allocated is less than 15% of mean annual land surface recharge is a **discretionary activity** under Rule 23(d)(ii) of the RPWS.

Under the PSWLP, the abstraction of groundwater water is a **permitted activity** under Rule 54(a) as less than 86 m<sup>3</sup> per day is proposed to be abstracted, and the applicant has a water meter on the bore.

***Summary***

Overall, the proposal is 'bundled' to mean that the consent applications are considered as **discretionary activities**.

## 4.2 Ancillary activities

Separate to this application, we note that the applicant has also lodged a consent application (APP-20211092) to Environment Southland that seeks to use land for dairy farming (that did not exist as of May 2016), to use land for dairy support (Schrama Block), to convert land on farm to dairy farm land, and to use land for a feed pad/lot. That application includes the applicant's Farm Environmental Management Plan and nutrient budget.

## 4.3 Consents not required

In accordance with Schedule 4 of the RMA, an application must describe and demonstrate compliance with any permitted activity that is part of the proposal to which the application relates.

**Table 9: Activities for which Consent is not required.**

Activity	Compliance with the relevant permitted activity rules.
Intensive Winter Grazing under the NES-FW	<p>A Land Use Consent for Intensive Winter Grazing under the NES-F is determined to not be needed. The Intensive Winter Grazing that does occur meets the permitted activity thresholds and was conducted during the reference period.</p> <p>12 ha of IWG that occurs, is about 4.5% of the proposed new land area. Significantly less than either the PSWLP or NES thresholds</p> <p>Refer to consent application APP-20211092 for further details.</p>
Feed pads/lots (Rule 35A of the PSWLP)	<p>Solid effluent is scraped from the feed pad and disposed to land in accordance with Rule 38 of the PSLP. Liquid effluent is collected and stored in the effluent storage pond. Feed pads are located approx. 300m from the nearest waterway.</p> <p>Refer to consent application APP-20211092 for further details.</p>
Use of land for the maintenance and use of an existing agricultural effluent storage facility (Rule 32D of the PSWLP)	<p>The use of land for the maintenance and use of an existing agricultural storage facility (includes ponds, weeping walls, sumps and stone traps etc) that was authorised before 4 April 2018 is a permitted activity providing the construction of the facility was authorised by a resource consent). The existing effluent storage infrastructure meets this provision.</p>
Incidental discharges from farming (Rule 24 PSWLP)	<p>The land use associated with this type of discharge is or will be authorised under Rule 20, 25 or 70.</p>
Fertiliser (Rule 10 RWPS & Rule 14 PSWLP)	<p>All practicable measures will be taken to minimise fertiliser drift beyond the target areas. Fertiliser will be applied to selected areas of the farms in accordance with nutrient budget</p>

Activity	Compliance with the relevant permitted activity rules.
	recommendations, and soil tests to avoid excess leaching of nutrients to groundwater. Fertiliser will be applied when a soil water deficit exists, and all waterways will have riparian margins with stock excluded.
The use of land for a silage storage facility and silage leachate (RWPS Rule 51, PSWLP Rules 40 & 41)	Silage is stacked on a rock/limestone pad (30m x 14m) with earth banks on 3 sides. The facility is approximately 100 m north of the dairy shed and over 500m from Titipua Stream and any of its tributaries. Silage leachate and runoff from the silage stack does not discharge into the effluent storage system. All silage storage facilities are located away from sensitive receiving environments, in accordance with permitted rule setbacks in the RWPS and PSWLP, and no direct discharge of silage leachate to any waterbody is proposed. No part of the silage storage facility is located on land that is made permanently or intermittently wet by the presence of springs, seepage, high groundwater, ephemeral streams, or flows of stormwater. There is no discharge of leachate directly to groundwater via a pipe, soak pit or other soil bypass mechanism and there is no overland flow or ponding of silage leachate outside of the silage storage facility. Cattle are not able to graze directly from the silage storage facility.
Solids and sludge (Rule 38 of the PSWLP)	Sludge effluent collected from the sludge beds and effluent pond (when desludged) will be dried as much as reasonably practical before applying to land when conditions are suitable, observing appropriate separation distances to critical source areas and other sensitive receptors such as streams, bores, property boundaries and dwellings. The application of sludge will be via muck spreader when soil and weather conditions are suitable and will not exceed 10 mm depth. Sludge is not discharged onto the same area any more frequently than once every two months and is only discharged to land when soil temperature is greater than 5 degrees Celsius in winter and 7 degrees Celsius in spring. There will be no disposal of solids to any waterway.
Cleanfill, Farm Landfills and Offal Holes (Rules 53, 54 & 55 of the RWPS, and Rule 42 & 43 of the PSWLP).	No more than 500 m <sup>3</sup> of material will be discharged within cleanfill sites. Stormwater will be directed away from fill areas and no unauthorised material will be placed into proposed fill areas. No naturally formed limestone rock is known to reside within the property. Excavation of fill holes do not intercept springs and are not below the seasonal mean groundwater level in that location. Sensitive areas can be easily avoided when undertaking these associated activities. Offal sites are to be covered and the surfaces to be restored to a similar state as surrounding land upon closing.
Stock exclusion from waterbodies (Rule 70 PSWLP)	All water bodies are fenced, and crossings are bridged over unnamed tributaries. Bed disturbance from stock is thus avoided and dairy cattle on the dairy platform are excluded from water bodies.
Drainage of Land (Rule 9 RWPS & Rule 13 PSWLP)	It is not anticipated that any discharge from subsurface drains would result in a conspicuous change to the colour and/or clarity of the receiving waters at a distance of 20 metres from the point of discharge. The proposed good management practices will significantly reduce the likelihood of any contaminants reaching the subsurface drains.

## 5. NON-NOTIFICATION & CONSULTATION

A consent authority has the discretion whether to publicly notify an application unless a rule or National Environmental Standard (NES) precludes public notification (in which case the consent authority must not publicly notify) or section 95A(2) applies.

The effects of the activities will be no more than minor, the applicant does not request public notification and there are no rules or NES' which require the public notification of the application. In addition, there are no special circumstances relating to the application. As such, notification of the application is not necessary.

Clause 6(1)(f) of Schedule 4 of the RMA requires the identification of, and any consultation undertaken with, persons affected by the activity. The assessment of environmental effects below demonstrates that no persons will be adversely affected by the proposal to a degree that is minor or greater. Overall, it is considered that this application should be processed non-notified and without the need for written approvals.

## 6. ASSESSMENT OF ENVIRONMENTAL EFFECTS

In addition to the application being made in the prescribed forms and manner, Section 88 of the RMA also requires that every application for consent includes an assessment of the effects of the activity on the environment as set out in Schedule 4 of the RMA.

### 6.1 Discharge of Agricultural Effluent

The discharge of agricultural effluent includes liquid effluent and sludge collected and discharged to the effluent pond from the feed pad. Existing discharge permit AUTH-301081-V1 currently excludes effluent from a feedlot or wintering pad. However, the existing effluent system incorporates effluent from the feed pad and so the effects of the dairy effluent discharge (discussed in the sections below) includes effluent from the feed pad.

While the application for the replacement of the existing effluent discharge permit has been bundled up as a discretionary activity, the PSWLP Rule 35 matters of discretion have been used as sub-headings below to assess the environmental effects of the proposal. These are:

1. Application depth or rate, storage requirements, nutrient loading rates (in particular nitrogen), size of the disposal area, timing of the discharge, and contingency plans;
2. The separation distance of the discharge from a river, lake, artificial watercourse, modified watercourse, natural wetland, subsurface drain, the coastal marine area, infrastructure, residential dwellings, places of assembly, urban areas, landholding boundaries, water abstraction points and registered drinking water supplies;

3. Measures to avoid, remedy or mitigate adverse effects (including cumulative effects directly related to the discharge of farm dairy effluent) on water quality, taking into account the nature and sensitivity of the receiving environment; and
4. The duration of consent, including in order to implement the outcomes of any Freshwater Management Unit Process to be undertaken in accordance with Policy 47.

### 6.1.1 Effluent Storage

The current effluent storage pond was constructed in 2014/2015 under the authority of land use consent AUTH-301083-V1. The pond is synthetically lined and includes a leakage detection system around the perimeter of the pond, as shown on the original pond layout plans in Appendix A.

The pond has a useable volume of 2,392 m<sup>3</sup> (after allowing for 0.5 m of freeboard). The existing discharge permit requires at least 2,332 m<sup>3</sup> of effluent storage. The Dairy Effluent Storage Calculation (DESC) assessment carried out for the original (2013) application showed that the maximum required volume was 2,788 m<sup>3</sup> and the 90% probability volume was 2,332 m<sup>3</sup>. The DESC undertaken in June 2021 for this property determined the maximum required volume to be 2,548 m<sup>3</sup> and the 90% probability volume to be 2,320 m<sup>3</sup> (i.e., less than the original volume required). This means there is sufficient storage capacity in the applicant's existing effluent system. Providing adequate storage will enable irrigation of effluent to be deferred when conditions are not suitable. Refer to Appendix B for the original and current DESC reports.

There is sufficient storage in the existing effluent pond to provide for any liquid effluent from the existing feed pad. Feed pad effluent is captured by drains in the pad and collected in a concrete tank, and a pump then transfers the effluent to the effluent storage pond. When calculating the required effluent storage pond, both the original DESC and current DESC accounted for liquid effluent from a 1,300 m<sup>3</sup> feed pad.

The pond and southern sludge bed have recently (16 June 2021) been visually assessed by a Suitably Qualified Person, Q Scandrett of Dairy Green Ltd, who confirmed that no visible cracks, holes or defects were evident that would allow effluent to leak from the effluent storage system. The pond's leak detection drainage was also identified and inspected during the visual inspection. The Visual Assessment report was peer reviewed by a Chartered Professional Engineer, Colin Macdiarmid of GeoSolve, who agreed with the conclusions reached and recommended that the northern sludge bed be inspected when emptied. The Visual Assessment report and peer review by Chartered Professional Engineer are contained in Appendices C and D, respectively.

### 6.1.2 Effluent Application Area, Depth/Rate and Timing

The applicant will apply effluent using a low-rate cobra travelling irrigator, but for flexibility seeks the ability to use an alternative or additional low-rate effluent irrigation system. The current discharge permit AUTH-301083-V1 authorises a maximum depth of application not exceeding 10 mm and maximum instantaneous rate of application of 10mm/hour. The applicant proposes to continue with this rate and depth of effluent application. This is considered appropriate for the following reasons, which are expanded on further below:

- proposed mitigations / Good Management Practices targeted at the different soil types and the Gleyed physiographic zone will reduce the risk of nutrient loss and surface contaminant loss
- large available effluent area
- alternate and contingency effluent irrigation system
- careful soil moisture deficit application

Effluent will be discharged onto Pukemutu, Makarewa and Titipua soils, which have a slight risk of nutrient leaching to groundwater. Effluent will always be applied at a depth less than the soil water deficit which ensures nutrients remain in the root zone to be taken up and utilized by plants for pasture production.

The relevant physiographic zones, Lignite/Marine Terraces and Peat Wetlands Physiographic Zones, indicate that soils in this zone have very good ability to remove nitrogen from groundwater to the atmosphere via denitrification. However, this process can be bypassed when contaminants are flushed to nearby surface water bodies via artificial drains and overland flow following heavy or sustained rainfall events. Good management practices in these zones include avoiding preferential flow of effluent through drains.

There is no tile drain map available for the property although it is likely that there is a field drain network due to the significant vulnerability of these soils to waterlogging (refer to previous Section 3.3.1). Regardless, the shallow depth of effluent application, topsoil assimilation and avoiding application in saturated conditions allows for appropriate treatment and reduces the risk of contaminants entering any field drains that may discharge into the nearby waterways.

The large available effluent area of approximately 100 ha allows some flexibility in selecting suitable paddocks in recognition of the key contaminant pathways of the relevant physiographic zones. Nevertheless, caution will be required to ensure effluent application only occurs when soil moisture deficit exists. The adequate existing effluent storage allows for application to be deferred until soil conditions are suitable.

As an alternative and/or contingency to use of their low-rate effluent system, the applicant will use a contractor with a slurry tanker or umbilical system (or other low-rate effluent system) to apply effluent at application depths no greater than 5 mm.

To ensure effluent is only applied when a soil water deficit exists, the applicant checks weather forecasts, checks the nearest soil moisture site on the ES website and checks paddocks before application to ensure that effluent is only applied when a soil water deficit exists. Effluent discharge will observe a 28-day return period. Effluent will be discharged to land year-round, on days when conditions are suitable. Furthermore, "proof of placement" of irrigators provides a record of effluent application and the required information to make informed decisions daily and seasonally regarding the forecasting of farm dairy effluent disposal.

In Southland, regular soil water deficits greater than 10 mm occur between the months of October to May. It is more difficult to schedule the effluent application to coincide with soil moisture deficits in August and

September. The applicant has accounted for this by ensuring there is sufficient storage through these times, allowing use of both their low-rate effluent application system and alternate/contingency contractor systems, and a large effluent irrigation area. Careful soil moisture deficit application scheduling can help maximise nutrient retention within the top 200 mm of soil<sup>8</sup>, enhancing the availability of nutrients which can be used by plants whilst avoiding ponding, odour, and overland flow.

Investigations undertaken at Lincoln, Massey, Invermay and other sites including some in Southland and Otago over the past 30+ years have shown that even with careful management of effluent applications in a situation where dairy shed effluent is being applied to dairy grazed land in relatively high precipitation environments, like Southland, there will be some annual average loss of nitrogen in drainage water. Similarly, other contaminants (phosphorus, sediment and faecal indicator organisms) lost to surface water rather than groundwater can be significantly reduced because of the application of good management practices. The good management practices described in this application will significantly reduce the risk to water quality.

Provided that farm dairy effluent is applied to land in the manner described, then any potential adverse effects associated with ponding, overland flow and or/nutrient leaching and microbial leaching to groundwater and surface water should be avoided as far as reasonably practicable.

### 6.1.3 Effluent Nitrogen Loading

Adverse effects from contaminant loss to water include water quality degradation which can adversely impact aquatic ecosystems and the overall health of water bodies. If nutrient loadings exceed 150 kg N/ha/year or nutrients are applied in excess then there is a risk of contaminant loss (N, P, sediment and microbial) to groundwater and surface water bodies.

The Overseer modelling (refer to associated application APP-20211092) indicates that the annual loading rate of liquid effluent is 28 kg N/ha/yr based on an effluent discharge area of 99.7 ha and assuming all areas receive an equal amount of effluent. An areal loading of 28 kg N/ha/yr equates to 19% of Environment Southland's recommended maximum loading rate of nitrogen onto any land area of 150 kg N/ha/yr from agricultural effluent or water containing agricultural effluent.

ES's recommended maximum loading rate of 150 kg N/ha/yr is supported by the 2009 report for ES by AgResearch<sup>9</sup> that recommended the maximum nitrogen load as a management criterion to avoid direct losses of land-applied FDE. Given that the proposed areal loading is a fraction of the limit recommended by AgResearch, land-applied FDE nitrogen leaching will be within acceptable limits.

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<sup>8</sup> Houlbrooke, D J, Monaghan R M (2009): The influence of soil drainage characteristics on contaminant leakage risk associated with the land application of farm dairy effluent, AgResearch Ltd

<sup>9</sup> Houlbrooke, D J, Monaghan R M, *The influence of soil drainage characteristics on contaminant leakage risk associated with the land application of farm dairy effluent*, 2009, AgResearch Ltd

Farm dairy effluent can be used as an organic fertiliser, which means that it relies on soil organisms to break down the organic matter. Nutrients are released more slowly than they are from inorganic fertilisers and this slow-release method reduces the risk of nutrient leaching. Inorganic fertilisers, such as urea, provide the same nutrition in a plant-ready form immediately, but the rapid release of nutrients creates a higher risk of leaching past the root zone.

The nutrient concentration of sludge is higher than liquid effluent due to the lack of dilution from rainwater or washdown water. However, sludge is generally considered lower risk to apply to land because it does not have the same risks of leaching, overland flow/runoff that purely liquid effluent has. Due to the higher concentration of nutrients, the application of sludge to land is carefully managed to ensure that nutrient loadings on any particular land area does not exceed the recommended level of 150 kg N/ha/year of effluent (both sludge and liquid effluent). This loading is achieved by ensuring the discharge area is large enough and the application depth is restricted to a maximum of 10mm.

Overall, the effluent disposal system described above allows the effluent to be used as both a fertiliser and soil conditioner with a lower risk of nutrient leaching than inorganic fertilisers.

#### 6.1.4 Effluent Irrigation Area

The effluent disposal area will be unchanged from that authorised by existing discharge permit AUTH- AUTH-301083-V1. The discharge area of 99.7 ha provides a discharge area to stock ratio of 16.6 ha per 100 cows, which achieves the minimum required in ES's Best Practice Guidelines, which is 8 ha/100 cows. This limit is derived as a further method for ensuring that ES's recommended 150 kg N/ha/yr areal loading limit for N (discussed above) is not exceeded.

Maintaining the relatively large current effluent irrigation area gives flexibility to ensure that paddocks selected for individual applications have sufficient soil moisture deficits.

Effluent will not be applied within the following buffer zones:

- 20 m of any surface watercourse
- 100 m of any potable water abstraction point
- 20 m to any landholding boundary; and
- 200 m of any residential dwelling on a neighbouring property

There are no other sensitive receptors that require separation measures to be implemented. Provided that these buffers zones are maintained, there should be no significant adverse effects resulting from the extent of the disposal area. A map of the existing/proposed effluent discharge area is contained in Appendix E.

#### 6.1.5 Effects on Groundwater Quality from Effluent Disposal

As the applicant will adhere to the buffer zones and is not seeking to change the existing effluent application area as described above, the disposal of effluent would very likely result in the same or reduced adverse



effects on groundwater quality in the vicinity of the property. The buffer zones ensure that any overland movement of contaminants is minimised. Contaminant transport towards sensitive receiving environments is dependent on many factors, including soil type, climate, and anthropogenic influences such as the presence of drains. These factors have been considered when confirming that the existing effluent discharge area and method (including rate and depth) are appropriate, and in ensuring that there is adequate storage to allow for deferred irrigation.

According to ES's Beacon GIS, the nearest community groundwater drinking water supply site that is piezometrically down-gradient of the effluent discharge area is Myross Bush School. This site is approximately 18 km south-west of the property, supplies water to 25-501 people and is in the Waihopai Groundwater Zone. There are no down-gradient community drinking water supply sites in the Makarewa GMZ. Of the bores piezometrically down-gradient of the effluent discharge area, only one is recorded as being used for domestic water supply, which is bore E46/0190 (47 m deep) located over 4 km south-west of the effluent discharge area.

Groundwater quality monitoring data within 5 km of the applicant's bore E46/1068 (which is within the effluent discharge area) indicates that overall groundwater quality meets the Maximum Acceptable Value (MAV) for *E. coli* in the New Zealand drinking water standards (less than one in 100 mL of sample).

For nitrate nitrogen, the concentrations in bores within 5 km of the applicant's bore range from 0.01 to 6.61 g/m<sup>3</sup> (= mg/L), although noting that the second highest reading was 2.53 g/m<sup>3</sup>. The MAV for nitrate (as the nitrate ion) in drinking water is 50 mg/L to prevent against short-term health risk to bottle-fed babies, and when expressed as nitrate nitrogen, the MAV is equivalent to 11.3 mg/L. This means that groundwater quality is generally good in the vicinity of the applicant's effluent discharge area.

Given the estimated nitrogen concentration in drainage, it is highly unlikely that there would be any adverse effects associated with nutrient losses from the disposal of effluent to land on these drinking water supplies or any other nearby drinking water sources. For any domestic bores that are piezometrically down-gradient, the proposed farm system is highly likely to reduce nitrogen and faecal pathogen losses relative to the status quo. There will be further attenuation, dilution and dispersion processes that will further reduce the concentration of contaminants in groundwater between the property and any sensitive receptors.

Other contaminants of concern include sediment and micro-organisms. Contaminant transportation towards sensitive receiving environments is dependent on many factors, including soil type, climate and anthropogenic influences such as the presence of drains. All of these factors have been considered when determining an appropriate irrigation location and method (including rate and depth), and in ensuring that there is adequate storage to allow for deferred irrigation.

The applicant restricts effluent irrigation to periods of good weather, and not under wet conditions. In addition, buffer zones, low application depths, and a 28-day return period for effluent application are

complied with. This means there is less risk of leaching, overland flow and losses via artificial drains occurring. The proposed application depths will enhance the ability of nutrients to be assimilated in the root zone in the top 200 mm of soil and reduce losses of contaminants to both surface and groundwater.

Provided that effluent is applied at the proposed rate/depths and effluent irrigation is avoided when conditions are not suitable, then adverse effects on water quality as a result of effluent application should be avoided as far as reasonably practicable. Accordingly, the effects on groundwater quality from the continued effluent disposal are considered to be no more than minor.

### 6.1.6 Odour

The effects of odour are most likely to occur from the discharge of farm dairy effluent. The existing effluent pond is located approximately 300 m from the nearest property boundaries and at least 1 km from the nearest neighbouring dwelling (located on Hedgehope Block Road).

The proposed maximum effluent application rate of 10 mm/hr is the same as authorised in the existing effluent discharge consent and will be applied via a low rate effluent irrigation system. Effluent will not be discharged within 20 m of any property boundary.

The physical location of the effluent infrastructure coupled with the proposed low application rate irrigation and effluent discharge buffers means there is no significant risk of adverse effects from odour and spray drift on surrounding landowners and occupiers. As such, the effects of odour are avoided.

### 6.1.7 Contingency Plans

An alarm and automatic switch-off system is installed, and this acts as a contingency measure in the event of an effluent system failure such as sudden pressure drop, irrigator stoppage or breakdown.

The contingency effluent irrigation system may be used at certain times if the usual methods of effluent discharge are under repair or if conditions allow for more effluent to be applied than the usual system is capable of conveying. This will be a contractor-operated irrigation system such as (but not limited to) an umbilical system or slurry tanker. A contractor-operated system may also be used for pond desludging as required, although noting that pond sludge build up will be relatively slow due to the use of the solids separator unit. Any discharges from the contingency effluent irrigation system must adhere to the rate and depth limits imposed on the consent.

### 6.1.8 Monitoring

Under existing discharge permit AUTH-301083-V1, the applicant pays an annual administration and monitoring charge to Environment Southland, which may include the cost of surface water quality monitoring of the watercourse near the effluent disposal field up and downstream of the discharge area.

Surface water quality monitoring has not occurred on this property, or any nearby property, and therefore

there is no data to form accurate conclusions of surface water quality trends at the site. Environment Southland have identified that infrequent sampling of surface water quality cannot adequately determine what impact, if any, a nearby activity is having on water quality. Surface water sampling is only effective in confirming the impact of gross pollution incidents for compliance purposes, as this has not been carried out to date.

Groundwater quality monitoring at the applicant's bore has also not been undertaken by Environment Southland, as discussed in Section 3.4.1.

## 6.2 Groundwater Abstraction

### 6.2.1 Allocation

The applicant's proposed abstraction represents a negligible portion of the allocation of the respective groundwater management zone. This application seeks to replace existing groundwater permits with no increase in the volume of water sought, therefore there will be no effect on current allocation volumes.

### 6.2.2 Stream Depletion and Interference Effects

Policy 29 in the RWPS and Policy 23 of the PSWLP requires a stream depletion assessment when the daily average rate of take is more than 2 L/s because takes less than this are expected to have a minor effect on stream flows. As the proposed take is 72,000 L/day, over 24 hours of pumping the rate of take is less than 2 L/s and therefore does not require a stream depletion assessment. In addition, the bore is not within 5 m of a surface water body, and so is not considered to meet the 'riparian' hydraulic connection classification in Table L.2 of the PSWLP.

Given that the rate of take is relatively low, our experience of bore interference modelling is that it is highly likely that any adverse interference effects on any existing neighbouring bores will be 'acceptable' in accordance with Appendix L.3 of the PSWLP, if at all measurable.

### 6.2.3 Effects on Groundwater Quality

The sparsity of groundwater quality information in the vicinity of the applicant's property makes it difficult to draw any conclusions on the state of the receiving groundwater.

The low rate of take is highly unlikely to result in the drawdown of contaminants from the upper soil profiles and so the proposed abstraction is not expected to have any adverse effects in terms of groundwater quality.

The bore is fenced to protect from stock and vehicle access or damage, and the bore head is raised above ground. The applicant is aware that the bore head needs to be adequately sealed to minimise the risk of contaminant ingress.

#### 6.2.4 Efficiency of Use

The proposed rate of take is 120 L/cow/day, which is consistent with Council's recommendations. The applicant is not opposed to the continued monitoring of water abstraction on the property to ensure that use is not excessive.

#### 6.2.5 Monitoring

The proposed abstraction will continue to be metered with records kept on a monthly basis, consistent with the existing conditions of consent. These records will be provided to Council annually at the end of the "water year" and upon request.

### 6.3 Archaeological effects

A search of the Heritage NZ website and Section 5.2 of the Southland District Plan indicates there are no recorded archaeological sites located on or near the property. Therefore, there will be no archaeological / historic heritage effects from the proposed activities.

### 6.4 Cumulative Effects

Regional scale modelling of N and P losses from agricultural land use in the Southland Region by Aqualinc in 2014<sup>10</sup> showed:

- Adoption of mitigation measures on farms could result in reductions in nutrient loads discharged in Southland;
- Within the agricultural sector, nutrient loss from dairy farms makes up a disproportionately large proportion of the nutrient load in most Southland catchments compared to the farm area;
- Adoption of mitigation measures on dairy farms alone significantly reduces catchment scale improvements in nutrient losses because sheep and beef farms make up the greatest area of land use. Overall, contributions from both land uses are significant; and
- Under the status quo of increasing production on dairy farms, water quality will not be maintained or improved in the long term even if very stringent mitigation requirements were to be adopted. Setting limits for catchment nutrient loads and then managing discharges to meet these limits appears to be the most appropriate method of ensuring the goal of maintaining and improving water quality in Southland will be achieved.

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<sup>10</sup> Aqualinc, 2014. *Assessment of Farm Mitigation Options and Land Use Change on Catchment Nutrient Loads*. Prepared for Environment Southland, report number C13055/04.

Although this study shows dairying is a significant contributor to nutrient loads in the Southland Region, it does not consider the receiving environment's assimilative capacity, or where measures are incorporated that would maintain or improve water quality. The report indicates there are 1,125 farms and a total farm area in the order of 249,000 ha in the New River Estuary catchment, being the relevant catchment for this farm. To quantify cumulative loads on a catchment scale would require the sophisticated modelling and setting of catchment limits that are outside the scope of this application.

The applicant proposes no changes to the maximum cow numbers, dairy effluent discharge area, or rate of groundwater abstraction. The proposed mitigations in this application and the Good Management Practices set out in the associated land use application and will result in an overall reduction in environmental impacts relative to the current dairy farming operation.

The sensitivity of the receiving environments to nitrogen and phosphorus inputs has been described in this report and it is considered that this individual activity provides sufficient mitigation measures to conclude that the significance of the activity on an individual scale is negligible on the New River Estuary catchment.

## **6.5 OverseerFM Modelling and Good Management Practices**

Under Rule 20 of the PSWLP, the use of land for dairy farming that was authorised before 4 April 2018 may continue until the PSWLP becomes fully operative provided that the effects of the activity are the same or similar in character, intensity, and scale.

As set out in the accompanying consent application, the applicant wishes to expand their existing 181.5 ha dairy platform onto a neighbouring 84.2 ha block of land, known as the "Schrama Block". The applicant proposes to milk up to 600 cows across the new extended dairy platform (265.7 ha total area). Therefore, in addition to this water take and effluent discharge consent application, the applicant has also sought consent to use land for dairy farming (that did not exist as of May 2016) under the PSWLP and to convert land on farm to dairy farmland (land use and discharge permit) under the NES-F.

The accompanying consent application includes the implementation of a wide range of good management practices and mitigation measures which avoid and mitigate adverse effects on the environment. These are also included in the applicant's Farm Environmental Management Plan (FEMP) that is attached to that application. The proposal also includes the recommendation that nitrogen and phosphorus output limits are imposed on the resulting land use consent. These limits would ensure that the activity is undertaken at a predicted contaminant loss level which is significantly less than the existing situation when modelled using the latest version of Overseer. These limits would be implemented via the land use consent conditions and the FEMP that includes all the relevant good management practices (GMPs) and mitigation measures.

The relevant physiographic zones, Lignite/Marine Terraces and Peat Wetlands Physiographic Zones, indicate that soils in this zone have very good ability to remove nitrogen from groundwater to the atmosphere via

denitrification. However, this process can be bypassed when contaminants are flushed to nearby surface water bodies via artificial drains and overland flow following heavy or sustained rainfall events. The applicant's good management practices associated with the discharge of effluent include reducing the accumulation of surplus nitrogen in the soil, and avoiding preferential flow of effluent through drains to reduce effects of overland flow and artificial drainage on underlying water quality.

## 6.6 Other Assessment Matters

In accordance with Clause 7 of Schedule 4 of the RMA the following provides an assessment of the activity's effects on the environment:

- a) any effect on those in the neighbourhood and, where relevant, the wider community, including any social, economic, or cultural effects*

The effects of the proposal already form part of the existing environment. Throughout the duration of the existing consents, there have been no known complaints from neighbours, which indicates that the potential adverse effects on the neighbourhood are less than minor.

The proposal will result in net positive benefits to the neighbourhood as there will be ongoing ability to provide for the social and economic benefits with the employment of staff, as well as contractors and consultants, and the farm is serviced by local schools and many businesses that would not benefit if the activities were unable to occur. More generally, 2018 data indicates that the dairy sector accounts for 7% of the regional employment in Southland, and agriculture more broadly contributed 8% to Southland Regional Gross Domestic Product.<sup>11</sup> The ability for the applicant to continue to operate their dairying operation will enable them to provide for their own social, economic and cultural wellbeing.

In terms of the potential effects on cultural values, an assessment of the proposal against the Te Tangi a Tairua is the Iwi Environmental Management Plan (applicable to the Southland Region), is made below. The proposal is considered to be wholly consistent with the relevant policies of the Iwi Management Plan.

- b) any physical effect on the locality, including any landscape and visual effects*

In terms of landscape and visual effects, the presence of effluent irrigation, other farming equipment and cows is expected within the rural locality. The proposal will not have any significant physical effects on the locality over and above that currently experienced.

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<sup>11</sup> Regional Fact Sheet: Southland. Retrieved 15/7/2021. <https://www.mbie.govt.nz/dmsdocument/11452-regional-factsheet-southland-pdf>

- c) any effect on ecosystems, including effects on plants or animals and any physical disturbance of habitats in the vicinity*

The dairy farm is located within a highly modified ecological landscape and the proposal will not have any significant adverse effects on ecosystems above that which has been occurring for many decades.

- d) any effect on natural and physical resources having aesthetic, recreational, scientific, historical, spiritual, or cultural value, or other special value, for present or future generations*

It is not considered that the activities will have any effect on aesthetic values, as the existing dairy platform is established and in keeping with the general rural nature of the area. The land in this area is historically known for farming activity, and the presence of a dairy operation on this property does not result in any effect contrary to the historical values associated with the natural and physical resources in the vicinity.

The waterways within the proposed dairy discharge area and surrounds are non-navigable and public access would be by permission of the applicant only. There is no evidence to suggest popular recreation fishing spots nearby which may be affected by the proposal. The effects on any cultural values are assessed below.

- e) any discharge of contaminants into the environment, including any unreasonable emission of noise, and options for the treatment and disposal of contaminants*

Effluent is proposed to continue to be treated and discharged to land as described earlier in this report. The assessment of alternatives provided in this report has concluded that this is the preferred solution for managing farm dairy effluent generated at the property. The activity is in keeping with the rural nature of the area, therefore it is not considered there will be any unreasonable emission of noise or odour.

- f) any risk to the neighbourhood, the wider community, or the environment through natural hazards or the use of hazardous substances or hazardous installations*

According to Environment Southland's Beacon GIS database, the southern tip of the effluent discharge area is located within the Makarewa Significant Floodplain. However, the effluent storage system (including effluent pond) is over 300 m north of this mapped floodplain area, outside of any mapped 'liquification risk' area and more than 30 km from the closest mapped active fault line.

All hazardous materials carried and used onsite will comply with the relevant rules of the Part operative Southland District Plan 2012, and the Hazardous Substances and New Organisms Act 1996. As such, there will be no risk to the neighbourhood, wider community or the environment due to natural hazards or the use of hazardous substances or hazardous installations.

On this basis, any risk to the neighbourhood, the wider community, or the environment through natural hazards or the use of hazardous substances is considered to be less than minor.

## 6.7 Assessment of Alternatives

Schedule 4 of the RMA requires that an assessment of environmental effects must include a description of any possible alternative locations or methods for undertaking the activity if it is likely that the activity will result in any significant adverse effect on the environment and/or if the activity includes the discharge of contaminants. None of the activities described in this report are expected to result in significant adverse effects on the environment and so this assessment of alternatives considers the proposed discharge of farm dairy effluent only.

### Method of Discharge

Deferred irrigation methods will be utilised on the property to ensure that effluent is only applied when conditions are suitable. Detention in the effluent pond also provides some level of treatment to the effluent before it is applied to land. Alternative methods may include direct discharge of the effluent to land on an as-required basis, regardless of the conditions. This would likely result in over-saturation of soils, ponding, overland flow and/or excessive leaching of contaminants, all of which can lead to significant adverse environmental effects. There are no other practicable environmentally acceptable alternatives to applying farm dairy effluent to land.

### Receiving Environment

Discharging effluent to land, if conducted appropriately, enables the reuse of a waste product as a soil conditioner and provides nutrients for plant growth. Attenuation of contaminants cannot occur if effluent is discharged directly to water and is therefore considered unsuitable. Direct discharge to water would almost certainly be more detrimental to the receiving environment than discharging to land.

Overall, the proposed discharge methods and receiving environment are the most suitable for managing the farm dairy effluent generated at the farm.

## 6.8 Summary

This proposal seeks to replace the current dairy effluent discharge permit and groundwater take permit. There are no new risks of effluent application or water abstraction beyond that already occurring on farm.

The effluent collection, treatment and disposal methods proposed are appropriate given on-site conditions and will ensure that any potential effects associated with effluent disposal are managed appropriately. No adverse effects are anticipated from the continued abstraction of groundwater.

The proposed activities will enable the applicant to provide for their economic and social wellbeing while providing environmental benefits in the form of reduced losses to the environment and no cultural values will be compromised.



## 7. Statutory Considerations

Schedule 4 of the RMA requires that an assessment of the activity against the matters set out in Part 2 and any relevant provisions of a document referred to in Section 104 of the RMA is provided when applying for a resource consent for any activity. These matters are assessed as follows.

### 7.1 Part 2 of the RMA

Section 104(1) RMA states that when considering an application for a resource consent, the matters which we have discussed above are subject to the purpose and principles in Part 2 RMA. However, the Supreme Court in King Salmon found that, in the absence of any uncertainty, invalidity or incomplete coverage in the relevant policy of plan document, there is no need to have recourse to an overall judgement approach under Part 2. We do not consider there are any instances of uncertainty, invalidity or incomplete coverage in the planning instruments discussed in the above sections.

Nevertheless, out of an abundance of caution, we have provided a discussion of the proposal in the light of Part 3. We have provided this discussion in the normal way treating the principles contained in sections 6, 7 and 8 as being subordinate to the purpose of the RMA as set out in section 5.

#### **Section 5 RMA – Purpose**

The purpose of the RMA is to promote the sustainable management of natural and physical resources. That is, the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic and cultural well-being and for their health and safety while:

- a. sustaining the potential of natural and physical resources to meet the reasonably foreseeable needs of future generations; and
- b. safeguarding the life supporting capacity of air, water, soil and ecosystems; and
- c. avoiding, remedying, or mitigating any adverse effects of activities on the environment.

The proposal is for the discharge of farm dairy effluent and the abstraction of groundwater, which are farming activities that use natural resources. The continuation of the activities as proposed will enable the applicant to provide for their economic and social wellbeing, and that of the immediate small Southland community and the wider regional economy in which it operates. Potential adverse effects of the proposal may exist, however the adverse effects have been adequately identified and assessed as able to be reduced or mitigated under the proposal.

Overall, the activity is considered to be consistent with Part 2 of the RMA, given the minor nature of the activity and the proposed mitigations.

## **Section 6 RMA – Matters of national importance**

Section 6 of the RMA required consideration of several matters of natural importance. The matters specifically relevant to this proposal include:

- The preservation of the natural character of the coastal environment, wetlands, and lakes and rivers and their margins and the protection of them from inappropriate subdivision, use and development;
- The relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu and other taonga.

The proposed activities will not impact directly on the coastal environments, wetlands, lakes and rivers. However, there is the potential for water quality effects on the wider receiving environment which includes these features. The assessment of environmental effects identifies potential effects on these receiving water bodies and provides appropriate and adequate mitigation measures to avoid adverse effects. The applicant acknowledges Maori have a long history and relationship with the area and consider that their proposal will not compromise or have an adverse impact on Maori culture, traditions or taonga.

## **Section 7 RMA- Other matters**

Section 7 of the RMA lists matters which all persons shall have particular regard to. Relevant to this application, these matters include kaitiakitanga, the efficient use and development of natural and physical resources, the intrinsic value of ecosystems, the maintenance and enhancement of the quality of the environment, and the protection of the habitat of trout and salmon.

As previously discussed, the assessment of environmental effects outlines mitigation measures to avoid or minimise adverse effects on water quality which in turn will avoid or minimise impacts on Section 7 matters.

## **Section 8 RMA- Treaty of Waitangi**

Section 8 of the RMA requires that applicants shall take into account the principles of the Treaty of Waitangi (Te Tiriti O Waitangi). Section 8 recognises the relationship of tangata whenua with natural and physical resources and encourages active participation of, and consultation with, tangata whenua in resource management decision-making.

We consider that the proposed activity is not inconsistent with the principles of the Treaty of Waitangi as required by Section 8.

## **7.2 Section 104(1) of the RMA**

In accordance with Schedule 4 of the RMA, an assessment of the activity against the relevant provisions of a document referred to in 104(1)(b) of the RMA must be included in an application for resource consent. Relevant documentation covered by this section are:

- National Environmental Standard for Sources of Human Drinking Water, 2007
- National Environmental Standard for Freshwater Management, 2020 (NESFM)
- National Policy Statement for Freshwater Management, 2020 (NPSFM)
- Te Tangi a Tauira - The Cry of the People, Ngai Tahu Ki Murihiku, Natural Resource and Environmental Iwi Management Plan, 2008
- Regional Policy Statement for Southland, 2017
- Region Water Plan Southland (RWPS), 2010
- Proposed Southland Water and Land Plan (PSWLP), 2018

Under the RMA, regional plans need to give effect to any NPS, NES and RPS. For an application of this scale, an assessment of the application against the regional plans is generally adequate as these plans ultimately give effect to the higher order statutory instruments. Relevant additional assessment is made against the National Policy Statement for Freshwater Management 2020 and National Environmental Standard for Freshwater 2020, as these documents post-date all of Southland's Plans (RPS, RWPS and PSWLP).

The following policies from the RWPS, and the PSWLP, which give effect to the plans' objectives, are relevant to this application for resource consent.

### 7.2.1 National Policy Statement for Freshwater Management 2020

The National Policy Statement for Freshwater Management 2020 (NPSFM 2020) took effect on 3 September 2020, as part of Government's Essential Freshwater package to restore and protect the health of New Zealand's waterways. The Essential Freshwater package signals a significant change in how activities that affect freshwater are dealt with. Instrumental in implementing this significant change is the fundamental concept of *Te Mana o te Wai* and a requirement to engage with tangata whenua to determine what *Te Mana o te Wai* means at a local scale. Determining the local approach to *Te Mana o te Wai* in consultation with tangata whenua and the rest of the community, will take time and will ultimately result in a formal RMA planning process to be notified prior to 31 December 2024<sup>12</sup>.

The NPSFM 2020 post-dates all of Southland's Plans (RPS, RWPS and PSWLP), and so as a later-in-time piece of national direction, it carries considerable weight in resource consent decision-making. Therefore, it is considered appropriate to undertake an assessment of the proposal against the objective and policies of the NPSFM 2020.

The objective and policies in the NPSFM 2020 give effect to the fundamental concept of *Te Mana o te Wai* and the associated hierarchy of obligations. Part 1.3 of the NPSFM 2020 sets of the concept of *Te Mana o te*

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<sup>12</sup> Clause 4.1(1) of the NPSFM 2020 provides that "*Every local authority must give effect to this National Policy Statement as soon as reasonably practicable*". Further, Section 80A(4) of the RMA requires regional councils to publicly notify any proposed plan, plan change, or variation, where the purpose of the same is to give effect to the NPSFM 2020, by 31 December 2024.

Wai as follows:

- (1) *Te Mana o te Wai is a concept that refers to the fundamental importance of water and recognises that protecting the health of freshwater protects the health and well-being of the wider environment. It protects the mauri of the wai. Te Mana o te Wai is about restoring and preserving the balance between the water, the wider environment, and the community.*
- (2) *Te Mana o te Wai is relevant to all freshwater management and not just to the specific aspects of freshwater management referred to in this National Policy Statement.*

Te Mana o Te Wai, as articulated by the NPSFM 2020, imposes a hierarchy of obligations. This hierarchy means prioritising the health and well-being of water bodies and freshwater ecosystems first. The second priority is the health needs of people (such as drinking water) and the third is the ability of people and communities to provide for their social, economic and cultural well-being. Clause 2.1 of the NPSFW 2020 similarly prioritises the health and wellbeing of waterbodies and freshwater ecosystems first when managing natural and physical resources as follows:

- (1) *The objective of this National Policy Statement is to ensure that natural and physical resources are managed in a way that prioritises:*
  - (a) *first, the health and well-being of water bodies and freshwater ecosystems*
  - (b) *second, the health needs of people (such as drinking water)*
  - (c) *third, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future.*

Six principles [mana whakahaere, kaitiakitanga, manaakitanga, governance, stewardship, and care and respect] inform the implementation of Te Mana o te Wai, in addition to the hierarchy of obligations.

A number of the principles set out for Te Mana o te Wai are relevant to Councils in giving effect to the NPSFM (for example through plan making processes), as they focus on tangata whenua's authority and responsibility and actions, as well as governance by the council. The first four principles (a-d) are difficult for an applicant to give effect to. Principle (e) regarding stewardship, and principle (f) regarding care and respect, are given effect to on the applicant's farm through the wintering barn and effluent system upgrades that will reduce contaminant loss to water. In addition, the applicant continues to implement on-farm GMPs including extensive riparian fencing, planting and wetland enhancement. For the same reasons, this proposal is consistent with the Te Mana o te Wai framework that priorities the health and well-being of water bodies and freshwater ecosystems.

This proposal has been carefully considered against the objective and policies which give effect to the fundamental concept of *Te Mana o te Wai*. In the context of the detailed assessment of adverse and positive effects in Section 6, we consider the proposal is not inconsistent with the hierarchy of obligations (Objective of the NPSFM) and with managing freshwater in a way that gives effect to Te Mana o te Wai (Policy 1 of the

NPSFM).

This proposal has been prepared with the wider catchment in mind, and cumulative effects of farming activities in the catchment. This is consistent with the 'Ki uta ki tai' (from mountains to the sea) integrated management framework, where users, stakeholders, Environment Southland, and community have been involved in identifying values for protection through the work to propose plan changes and Freshwater Management Units.

Further discussion of relevant policies within the NPSFM is provided in the table below.

**Table 10: Applicable policies from the NPSFM (2020).**

Policy	Wording	Comment
1	Freshwater is managed in a way that gives effect to <i>Te Mana o te Wai</i> .	See above discussion.
2	<i>Tangata whenua</i> are actively involved in freshwater management (including decision making processes) and Māori freshwater values are identified and provided for.	See above discussion.
3	Freshwater is managed in an integrated way that considers the effects of the use and development of land on a whole-of-catchment basis, including the effects on receiving environments.	Trend data indicates both declining and improving trends depending on the parameter. Surface water quality in the receiving environment (as measured at 'Hedgehope Stream at the Makarewa River confluence') indicate that the overall water quality is degraded for various contaminants. The health and well-being of the receiving environments is predicted to improve as a result of mitigations implemented on farm in association with the proposed activities.
4	Freshwater is managed as part of New Zealand's integrated response to climate change.	Same as for Policy 3.
5	Freshwater is managed through a National Objectives Framework to ensure that the health and well-being of degraded water bodies and freshwater ecosystems is improved, and the health and well-being of all other water bodies and freshwater ecosystems is maintained and (if communities choose) improved.	Same as for Policy 3.
12	The national target (as set out in Appendix 3) for water quality improvement is achieved.	The national targets from primary contact are based on water quality in terms of <i>E. coli</i> and cyanobacteria. As there are no proposed changes to the effluent system, which has been designed

		to utilise low-rate application, deferred storage of effluent and strategic application to a variety of soil types, water quality improvements are likely being made.
13	The condition of water bodies and freshwater ecosystems is systematically monitored over time, and action is taken where freshwater is degraded, and to reverse deteriorating trends.	Water quality monitoring on Hedgehope Stream is carried out under ES's State of the Environment monitoring program to ensure monitoring over time to identify trend data. The proposal includes management of nutrient inputs and outputs from the farm in order to identify areas of improvement which could improve water quality in the receiving waters.
15	Communities are enabled to provide for their social, economic, and cultural wellbeing in a way that is consistent with this National Policy Statement."	The proposal provides greater opportunities of the local economy in terms of permanent jobs and support of local schools and communities. Positive economic, social and cultural well-being should result.

## 7.2.2 Regional Plans and Te Tangi a Taurira

Relevant policies from the RWPS, and the PSWLP are considered relevant to this application and are assessed below. The rules and policies in PSWLP have legal effect from the date of notification and weight must be given to the policies contained in PSWLP alongside the existing policies in the RWPS. Consideration of the Iwi Management Plan – Te Tangi a Taurira is also included below.

### 7.2.2.1 Water Quality

Planning Document	Particularly relevant sections
Southland Regional Policy Statement	Objectives WQUAL.1, WQUAL.2, Policies WQUAL, 1, 2, 5, 7, 8
Regional Water Plan for Southland	Policies 6, 11, 25, 41 and 42
Proposed Southland Water and Land Plan	Policy A4 of NPSFM Objectives 6 and 8 Policies 6, 15B, 16, 17, 18, and 39A
Te Tangi a Taurira	Section 3.5.13 and 3.6.13

Objective WQUAL.1 is of significant relevance to the proposal as it sets the water quality framework for the management of water quality in Southland. The objective requires four primary things:

- The life supporting capacity of water and related ecosystems is safeguarded;

- The health of people and communities is safeguarded;
- Water quality is maintained or improved in accordance with the National Policy Statement for Freshwater Management 2020;
- Freshwater quality is managed to meet the reasonably foreseeable social, economic and cultural needs of future generations.

The proposed dairy discharge area is within the Lignite/Marine Terraces and Peat Wetlands Physiographic Zones. Policies 6 and 11 of the PSWLP requires the implementation of GMPs to manage adverse effects cumulatively and propose GMPs and mitigations (where appropriate) to mitigate and/or avoid effects of the activities on water quality. These GMPs and mitigations will be implemented from the FEMP, and through this and the associated land use consent. Genuine attention and thought have been given to the potential adverse effects of the proposal on water quality, in the context of the most likely contaminant pathways.

Policy 15B aims to improve water quality by reducing nutrient discharge (both direct and diffuse) from the farm. The application strongly indicates that nutrient discharge will be reduced under the proposal across the landholding:

- Cow numbers are not increasing, and there is no change to the dairy effluent discharge area.
- Farm dairy effluent is disposed via a low-rate irrigation system at a rate no more than 10 mm per hour onto Category A and C soils.
- Good management practices, such as effluent discharge buffer zones, and applying effluent at depths less than soil water deficit are adhered to.
- The effluent pond provides sufficient deferred storage and provides certainty that effluent will only be irrigated on land when soil conditions permit.

Therefore, the application is consistent with this policy and adverse effects of the discharge to the receiving environment will be appropriately mitigated.

Policy 16 of the PSWLP requires the minimising of adverse environmental effects from farming activities. This proposal does not involve an increase in the number of cows from what is already consented and therefore no increase in dairy effluent discharge. Therefore, the proposal is consistent with Policy 16 as the assessment here demonstrates the mitigation applied to minimise adverse environmental effects on the downstream sensitive receiving environments.

Policy 16(1)(b)(iii) may apply as it is our assumption that no lowland surface water body in Southland meets the Appendix E water quality standards for all attributes. However, in the context of demonstrating that there will be some improvement in water quality over time as a consequence of the effluent discharge mitigations, it is considered that the 'generally' component of the policy applies and Policy 15B and the higher objectives would provide an appropriate approach that would support granting application that have been able to

demonstrate that they would result in an improvement in water quality.

Policy 15B of the PSWLP requires improvement of water quality where it does not meet Appendix E standards and this proposal is consistent with this policy. The proposal provides for a variety of measures which either avoid or further mitigate against adverse effects on water quality which are described in detail earlier.

### 7.2.2.2 Water Quantity

Planning Document	Particularly relevant sections
Southland Regional Policy Statement	Objectives WQUAN.1, WQUAN.2, Policies WQUAN 2, 5, 6, 7, 8
Regional Water Plan for Southland	Policies 14A, 21, 22, 28, 29 and 31
Proposed Southland Water and Land Plan	Policy B7 of NPSFM Objectives 11 and 12 Policies 20, 21, 22, 23 and 42
Te Tangi a Taurira	Section 3.5.14

Objective WQUAN.1 is of significant relevance to the proposal as it sets the water quantity framework for the management of water quantity in Southland. The objective requires four primary things:

- The life supporting capacity of water, catchments and related ecosystems is safeguarded;
- The limits and targets set to achieve freshwater objectives are complied with;
- Water quality is maintained or improved in accordance with the National Policy Statement for Freshwater Management 2020;
- Freshwater quality is managed to meet the reasonably foreseeable social, economic and cultural needs of future generations.

Policy 20(1A) of the PSWLP requires the management of groundwater abstraction and use so as to recognise that the use and development of Southland’s land and water resources, including for primary production, can have positive effects including enabling people and communities to provide for their social, economic and cultural wellbeing. The proposal provides greater opportunities of the local economy in terms of permanent jobs and support of local schools and communities. Positive economic, social and cultural well-being should result, and therefore the proposal is consistent with this policy.

Policy 20(2) of the PSWLP requires a proposal to avoid, remedy or mitigate significant adverse effects from the use and development of groundwater resources on: (a) long-term aquifer storage volumes; (b) the reliability of supply for lawful existing groundwater users, including those with existing, but not yet implemented, resource consents; (c) surface water flows and levels, particularly in spring-fed streams,



natural wetlands, lakes, aquatic ecosystems and habitats (including life supporting capacity and ecosystem health and processes of water bodies) and their natural character; and (d) water quality. The rate of take and volume of water sought is the same as authorised in existing water permit AUTH- 301082-V1, is reasonable for the intended use and none of the adverse effects listed in this policy will result from the proposed abstraction of groundwater.

Policy 21 of the PSWLP sets out the requirements to manage the allocation of groundwater. The proposed abstraction of groundwater will not increase the existing consented daily volume and so will not adversely affect existing allocation limits.

Policy 22 of the PSWLP sets out the requirements to manage the effects of groundwater abstraction by avoiding stream depleting abstractions that would not safeguard the mauri of that waterway and mahinga kai, taonga species or the habitat of trout and salmon, and by ensuring interference effects are acceptable, in accordance with Appendix L.3. The proposed rate of abstraction is less than 2 L/s as an average over 24 hrs and so none of the adverse effects listed in this policy are expected. In terms of interference effects, given that the rate of take is relatively low, our experience of bore interference modelling is that it is highly likely that any adverse interference effects on any existing neighbouring bores will be 'acceptable' in accordance with Appendix L.3 of the PSWLP, if at all measurable.

Policy 23 of the PSWLP requires the management of stream depletion effects resulting from groundwater takes which are classified as having a Riparian, Direct, High or Moderate hydraulic connection, as set out in Appendix L.2 Table L.2. The proposed instantaneous rate of abstraction is 2 L/s, with a minor daily volume decrease, and so none of the adverse effects listed in this policy are expected.

Therefore, the proposal is consistent with the relevant policies noted above.

### 7.2.2.3 Effluent discharge

Planning document	Particularly relevant sections
Southland Regional Policy Statement	Objectives WQUAL.1 Policies WQUAL.8, WQUAL.10
Regional Water Plan for Southland	Policies 7, 31A, 31C, 31D, 41 and 42
Proposed Southland Water and Land Plan	Policies 13, 14 and 17
Te Tangi a Tauira	Section 3.5.1

Policies throughout the relevant planning documents stress a preference for the discharge of contaminants to land as it creates less environmental effects, enables an effective and efficient re-use of a waste produce and protects values as described in Te Tangi a Tauira. The management of effluent in the proposal meets best practice and is designed to avoid any surface runoff, overland flow, ponding, contamination of water via,

deep drainage or overland flow from the application of effluent to land. The land which will be receiving effluent is considered suitable and the discharge areas are sized appropriately to lower overall nutrient loads from the application of effluent.

#### 7.2.2.4 *Tangata Whenua*

Planning Document	Particularly relevant sections
Southland Regional Policy Statement	Policies TW.3, TW.4
Regional Water Plan for Southland	Polices 1A
Proposed Southland Water and Land Plan	Policies 1 and 2
Te Tangi a Taurira	Entire document

The Southland Regional Policy Statement describes the resource management issues important to Ngai Tahu in the Southland regional and includes ensuring tangata whenua is considered in decision making, iwi management plans are recognised, taonga and sites of special significance are protected and food gathering resources are protected. Te Tangi a Taurira is the iwi management plan recognised by Ngai Tahu which encompasses the Southland region. Policies TW.3 and Policy 2 of the PSWLP require iwi management plans to be taken into account.

This proposal includes mitigation that will ensure that the effects of the activities will not materially impact on tangata whenua values or compromise sites of special significance of food gathering sites. The cumulative effects assessment concludes that any effects felt outside the boundary of the property will not degrade water quality and not impact on cultural values such as mahinga kai.

In addition, the application provides for the following in accordance with Te tangi a taurira:

- The provision of buffer zones to water abstraction sites and waterways;
- The application effluent is to land rather than water;
- The applicants already adopts best practice for land application of managing farm effluent;
- The existing riparian margins are protected;
- Deferred application of liquid effluent and solid effluent is provided for;
- Nutrient loading from effluent discharges to land is already within industry best practice limits;
- The system and management practices are considered appropriate for the risks associated with the receiving environment;
- Water abstraction is monitored with metering results to be submitted to Council;
- Regarding Policies 3.5.14.17 and 3.5.1.17, the consent periods proposed are less than 25 years.

## 7.3 Sections 105 and 107 of the RMA

In addition to the matters in Section 104(1) of the RMA, if an application is for a discharge permit a consent authority must have regard to the matters as specified in Section 105. The proposed discharge will be undertaken in a manner which further reduces contaminants entering water through controls on application method and conditions of consent. As land-applied nutrients can be reused, there is a direct benefit to the property as a method for improving soil fertility. The discharge of effluent to land is the best method for avoiding adverse effects on water, especially relative to discharges directly to water.

There are no matters under Section 107(1) of the RMA that would require the consent authority to decline this application i.e., the effluent discharge to land is unlikely to cause any of the listed adverse effects.

## 8. Consent Duration, Review and Lapse

### 8.1 Consent Duration

With regard to consent duration, special consideration has been given to Policies 14A and 43 of the RWPS and Policy 40 of the PSWLP, and Te Tangi a Taurira which have been grouped below for ease of assessment.

#### **Certainty of the nature, scale, duration and frequency of effects**

The potential effects of the proposed activities are understood and will be managed as far as reasonably practicable. Whilst the potential adverse effects of this proposal are expected to be similar to those expected on an average dairy farm, it is noted that the level of understanding in this field is increasing. Council's level of knowledge regarding the underlying groundwater aquifer, the receiving soils and surface water management zone is also improving, with continued knowledge and research of Southland and the site being achieved in the form of the proposed physiographic units and future catchment specific studies.

Potential adverse effects have in the first instance been mitigated by appropriate management techniques on farm followed by contingency planning and ongoing monitoring. Whilst the potential effects are reasonably well understood, the advances in research and development suggest that there is still a lot to be understood. It is because of this that a 35-year term is not proposed.

#### **Matching consent duration to the level of risk of adverse effects.**

The extent and nature of the actual and potential adverse effects of the activities on the existing environment (which includes the current dairy farm) were assessed in this AEE and concluded to be no more than occurring historically in the existing environment.

#### **Relevant Tangata Whenua values and Ngai Tahu Indicators of Health**

The application has been assessed as consistent with the relevant tangata whenua values as outlined in the iwi management plan, with particular regard to the proposed consent duration being less than 25 years.

#### **Duration sought by the applicant and supporting information**

The applicant seeks a 10-year consent duration for all activities requiring consent set out in this application based on the following information:

- The level of certainty about potential effects for this specific application is high because of the ongoing use of the current effluent storage, and the low-rate effluent irrigation system.
- The proposed daily volume of water applied for is the same as in the current permit, is reasonable for the intended use, and is unlikely to result in over-allocation or depletion of the groundwater resource within a 10 year consent term.

A 10 year consent duration for the effluent discharge permit and water take permit is consistent with Policy 40 PSWLP.

#### **The permanence and economic life of any investment**

Significant investment has been required just to get to the point of making the application, with expenditure on professional services, including business feasibility studies, nutrient advice, water quality and policy and planning assessments.

The investment in both properties is significant and in the order of millions of dollars. The market for dairy products both nationally and globally is strong. Commodity market influence is always a factor and will influence the profitability of the proposed farm. An appropriate consent duration will encourage investment and improvements on farm which can improve environmental outcomes and buffer the applicant's ability to respond to commodity market changes which secures the permanence of the activity. Furthermore, the permanence of the economic life of the activity requires resource consents to be granted from the Council for a reasonable duration.

#### **Common expiry date for permits that affect the same resource**

A common expiry date for the effluent discharge and groundwater permits is considered appropriate because these activities are part of an integrated dairy farm operation with impacts on the same or related land and water resources.

#### **Applicant's compliance history**

The applicant has demonstrated a good compliance history with the existing resource consents and there is no evidence to suggest that future compliance will not continue to be good.

#### **Timing and development of FMUs**

Granting 10 year duration resource consents will not adversely affect the development and implementation of any revised framework established in the FMU section of the PSWLP, as Council has the ability to have new rules take effect from the date of notification of a plan change and would also be able to review all contents in the catchment collectively.

### **Summary**

In conclusion, due to the low level of environmental risk of the proposed activities and a substantial value of investments on the property, a 10 year duration for the effluent discharge and groundwater take permits is considered appropriate.

## **8.2 Review of Lapse**

The applicants have no objection to the Environment Southland standard review conditions in accordance with Sections 128 and 129 of the RMA. A lapse condition is not needed for an application to continue an existing activity.

## **9. Conclusion**

A decision to grant the resource consent applications under Section 104B of the RMA is recommended on the basis that:

- a) the adverse effects on the environment are highly likely to be insignificant;
- b) The proposal is consistent with the requirements of the RMA, relevant plan objectives and policies and other relevant matters.

The proposal enables opportunities for the applicant to sustainably, efficiently and profitably run their dairy farm whilst still maintaining positive environmental outcomes. Granting the resource consent applications will be consistent with the purpose of the RMA for the reasons explained within this report. The proposed activities are highly unlikely to result in further degradation of water quality and potential adverse effects will be appropriately avoided or mitigated.

## **Appendix A: Original Effluent Pond Design Drawings**

# Titipua Ltd Partnership

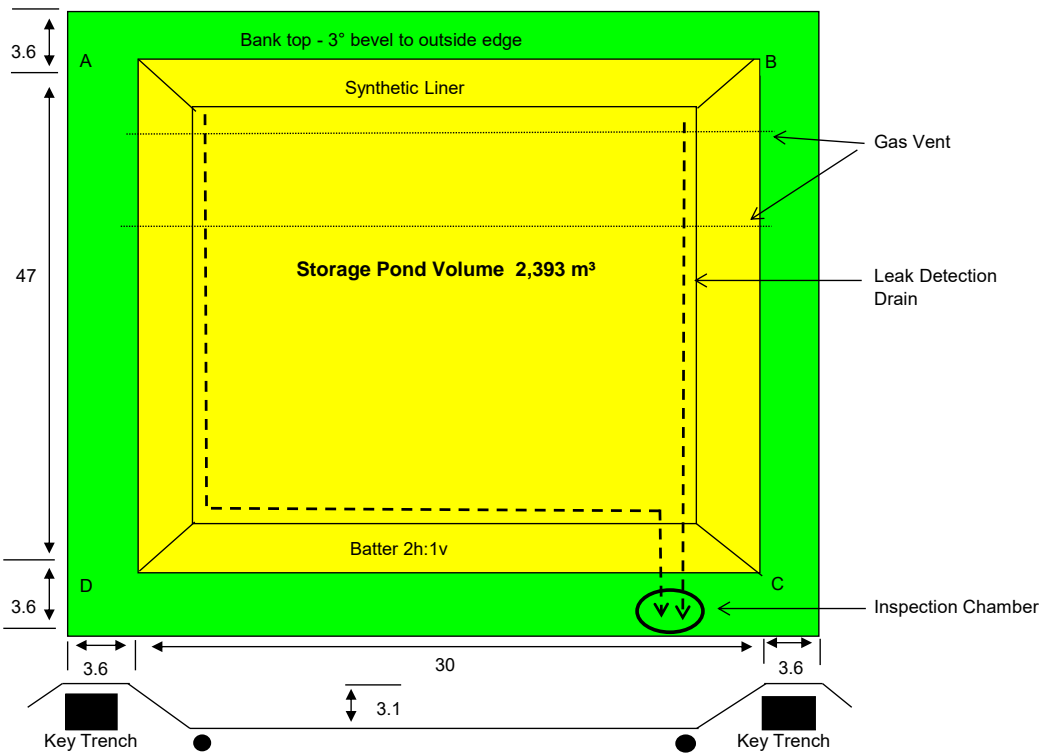
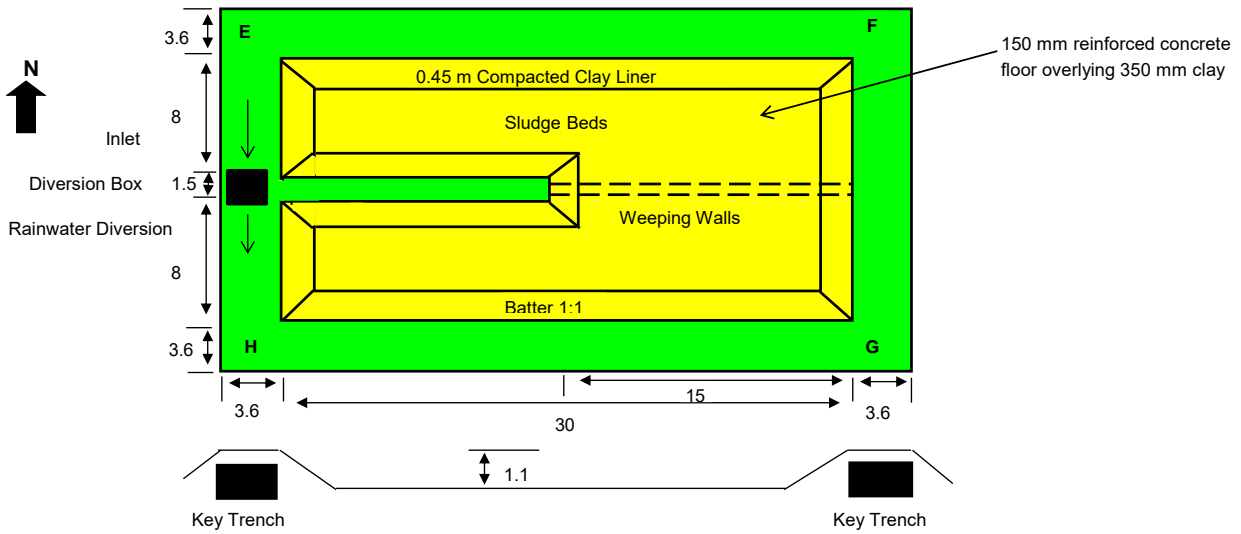
Storage Pond and Sludge Beds Plan

© Dairy Green

Not To Scale

Dimensions = m

Outside Batters 1:1



Point	Cut m	Fill m	Relative Height m
A	3.10	0	9.66
B	2.46	0.64	8.02
C	0.42	2.68	5.98
D	1.60	1.50	8.94
E	1.51	-0.41	10.00
F	0.77	0.33	9.26
G	0.11	0.99	8.60
H	0.79	0.31	9.28

Datum will be invert of dairy shed drain once supplied by the builder

Datum

## Appendix B: Original Dairy Effluent Storage Calculations



## Disclaimer

I/We acknowledge and agree that:

1. the results contained in the report which DairyNZ will provide following my/our use of the Dairy effluent storage calculator ("the calculator") are generated based on the data which I/we have inputted into the calculator; and
2. the reliability of the results and the report is dependent upon a number of variables including, without limitation, the accuracy of the input data, and the validity of the assumptions and algorithms used in the calculator in relation to the input data which may be updated to reflect development in effluent knowledge; and
3. the results contained in the report cannot be relied upon solely to ensure the effluent storage system:
  - a. meets the current or future requirements of the district or regional plans of the local territorial authority or regional council or any other authority having jurisdiction.
  - b. has the storage capacity to allow practical management of the effluent system.

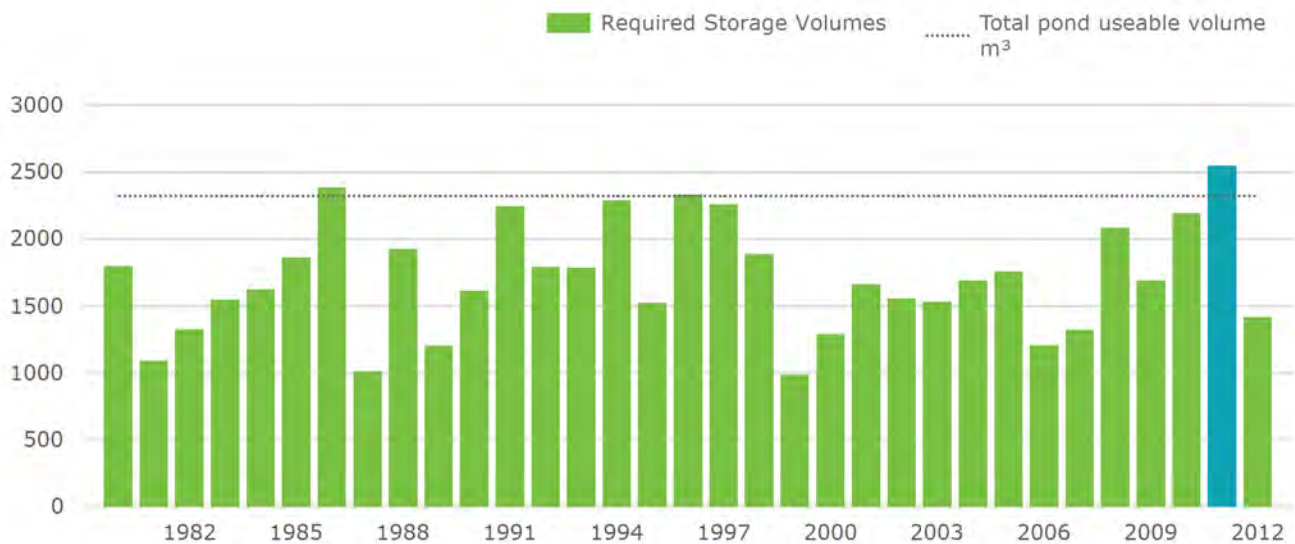
**Accordingly, DairyNZ does not accept liability for any loss, damage, cost or expense suffered or incurred by me/us or any third party to whom this report has been provided (whether by me/us or another person) in connection with the use of, and reliance on, the report and the results contained in it.**  
 DairyNZ's website terms and conditions (which can be found at <https://www.dairynz.co.nz/terms-and-conditions>) otherwise apply to the use of this service and the provision of the report and the results in it.

## Titipua Partnership

Hedgehope Block Road

<b>Supplier Number</b>		600 cows consented, twicer per day milking until 15 Dec, then 16 hour milking
<b>Storage max m<sup>3</sup></b>	2,548.29	
<b>90th percentile m<sup>3</sup></b>	2,279.40	Greenwash used at the dairy shed 40 L/cow/day water use Rainwater diversion used in the off season
<b>Total pond useable volume m<sup>3</sup></b>	2,320.83	High risk soils for effluent application
<b>File owned by</b>	Quinton Scandrett	Cobra rain gun used for effluent application
<b>Created by</b>	Quinton Scandrett	Sludge beds entered in solids separation
<b>Created on</b>	20 Jun 2021	Calving pad entered in animal shelter used by 120 cows in spring - not diverted
<b>Last modified by</b>	Quinton Scandrett	
<b>Last modified on</b>	22 Jun 2021	Existing effluent pond entered

## Required Storage Volumes



## Climate

<i>Site</i>	<i>Mean Rainfall mm</i>	<i>Altitude m</i>
Woodlands Garvie Rd	1031	52

## Soil

<i>Low Risk Soil ha</i>	<i>Minimum High Risk Soil ha</i>	<i>Surplus high risk soil ha</i>
0	80	0

## Irrigation

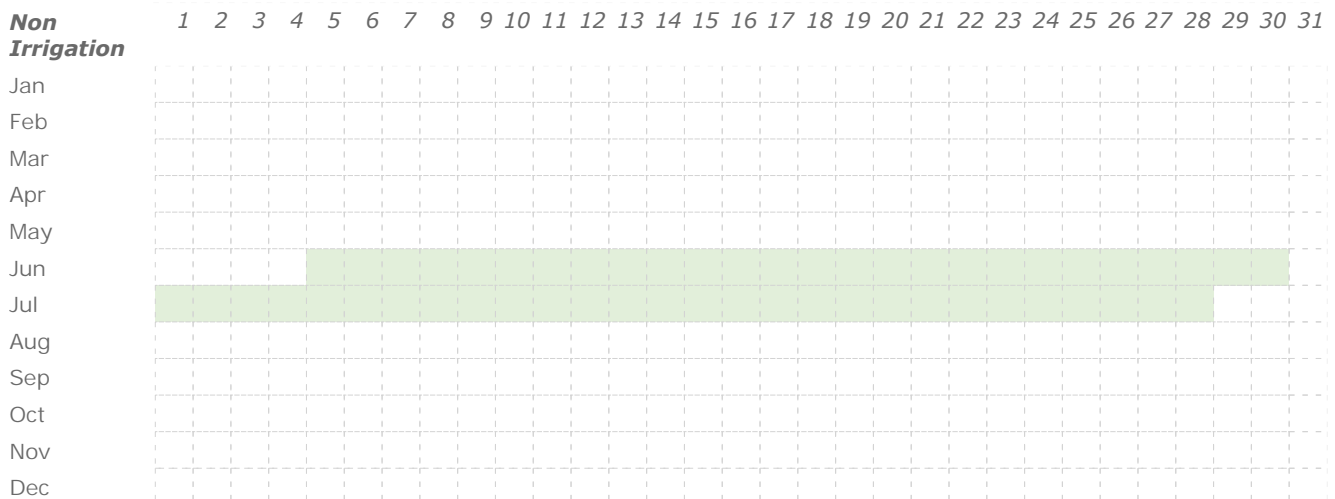
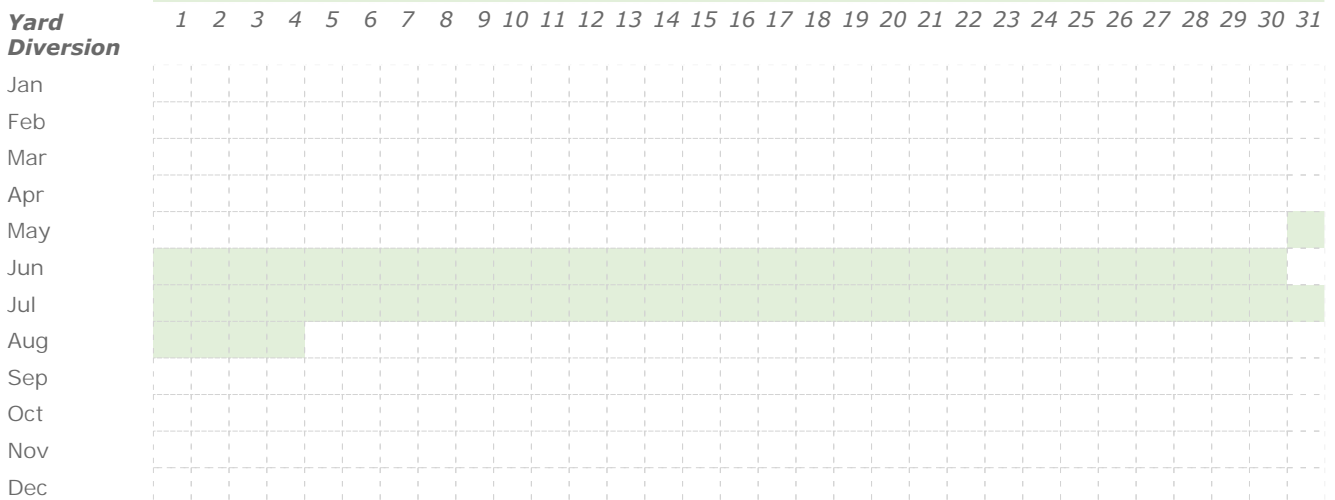
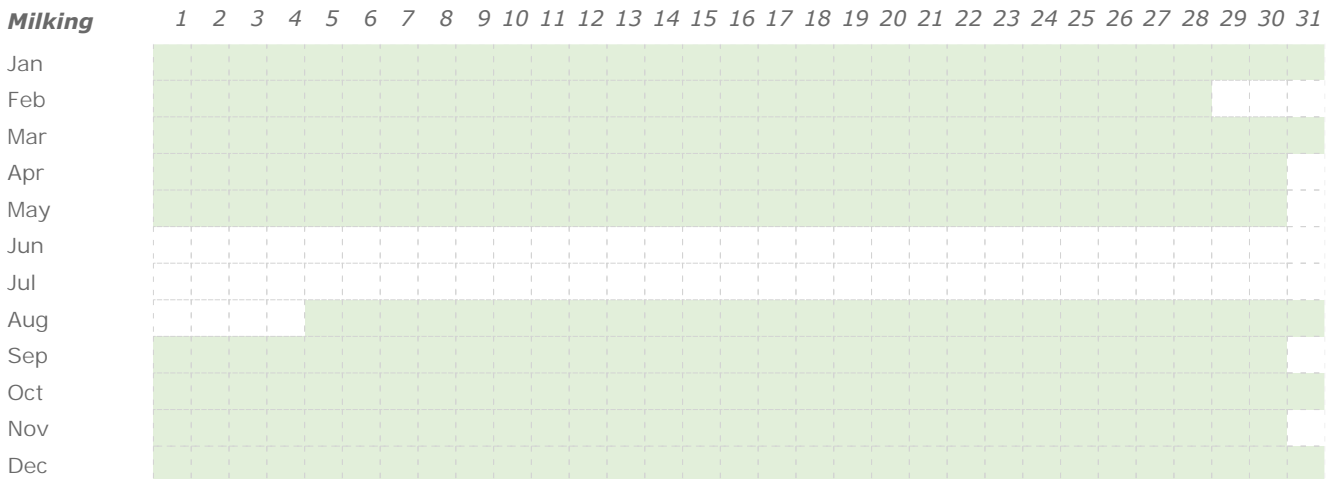
<i>Calculated option</i>	<i>Application depth mm</i>	<i>Pump volume m<sup>3</sup></i>
Specified	2	55
Specified	5	125
Specified	10	200

**Catchment**

<b>Shed</b>		<b>Yard</b>		<b>Feedpad</b>			<b>Animal Shelter</b>			<b>Other</b>
Area m <sup>3</sup>	Diverted	Area m <sup>3</sup>	Diverted	Area m <sup>3</sup>	Covered	Diverted	Area m <sup>3</sup>	Covered	Diverted	Area m <sup>3</sup>
350	Yes	998	Yes	0	No	No	1320	No	No	0

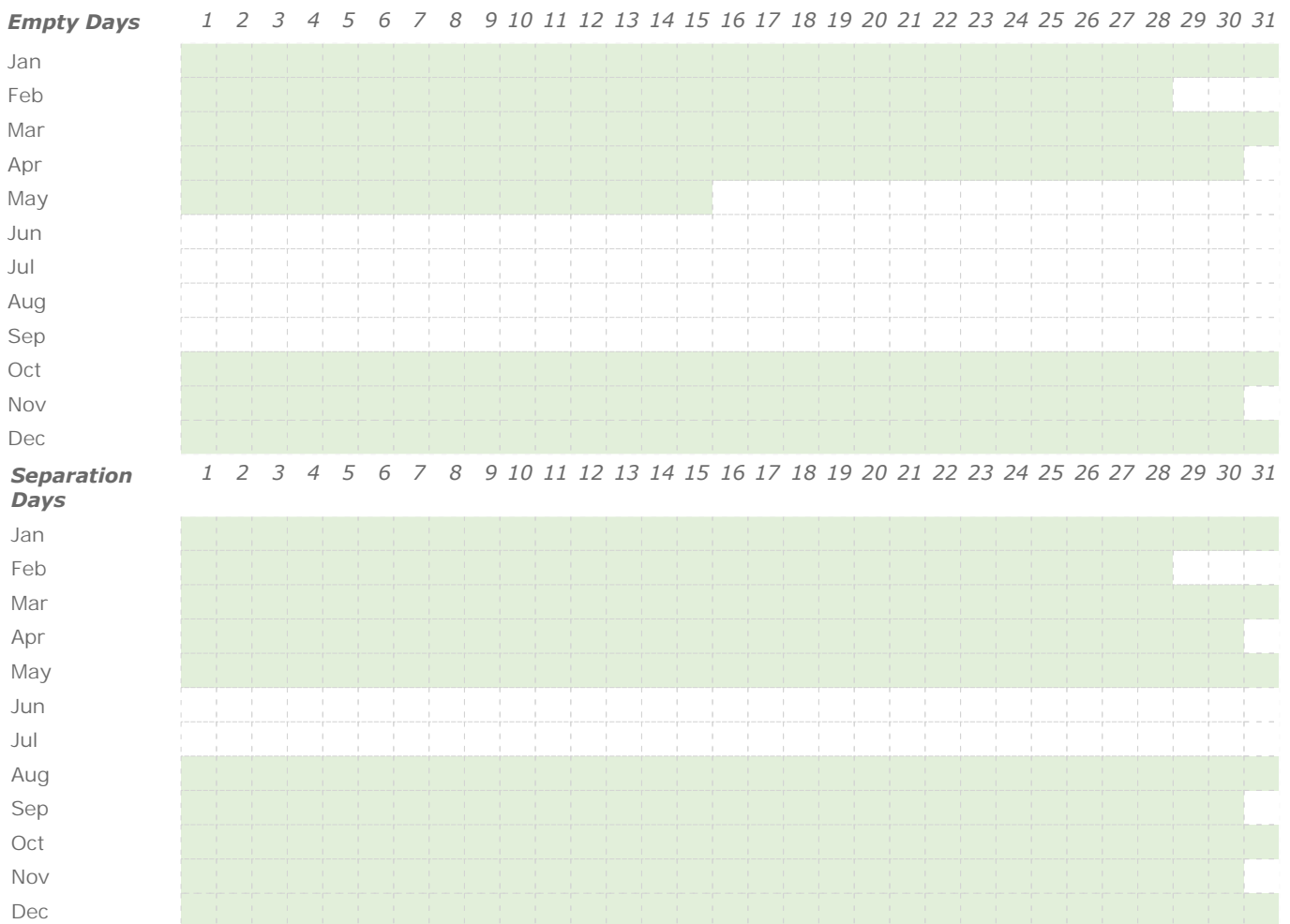
	<b>Yard</b>				<b>Animal Shelter</b>		
	Cows	Hours	Volume m <sup>3</sup>	Wash LCD	Cows	Hours	Volume m <sup>3</sup>
Jan	600	3	24	0	0	0	0
Feb	600	3	24	0	0	0	0
Mar	600	3	24	0	0	0	0
Apr	600	3	24	0	0	0	0
May	550	3	22	0	0	0	0
Jun	0	0	0	0	0	0	0
Jul	0	0	0	0	0	0	0
Aug	350	3	14	0	120	24	0
Sep	550	4	22	0	120	24	0
Oct	600	4	24	0	60	24	0
Nov	600	4	24	0	0	0	0
Dec	600	4	24	0	0	0	0

**Calendar**



### Solid Unit

<b>Name</b>	Sludge Beds
<b>Type</b>	Regular
<b>Dimension</b>	length 30m, width 8m and height 1m
<b>Input Source</b>	Yard
<b>Dry Matter %</b>	6
<b>Separator Efficiency %</b>	35
<b>Four Day Forecast SWDExcess</b>	5
<b>Minimum SWD Application</b>	10



**Storage**

Emergency Storage Period 0

<i>Storage Name</i>	<i>Covered</i>	<i>Pumped</i>	<i>Type</i>	<i>Dimension</i>
Irrigation Pond	No	On	Regular - Rectangular	length 47m, width 30m, height 3.1m, sludge height 0.1m freeboard height 0.5m and batter 2:1

## Appendix

<i>Season</i>	<i>Required Storage Volumes m<sup>3</sup></i>
1980	1,793.73
1981	1,091.79
1982	1,325.77
1983	1,546.73
1984	1,626.36
1985	1,861.10
1986	2,380.61
1987	1,010.60
1988	1,924.60
1989	1,200.60
1990	1,614.68
1991	2,241.85
1992	1,786.85
1993	1,783.65
1994	2,285.27
1995	1,522.19
1996	2,329.67
1997	2,255.92
1998	1,884.17
1999	986.05
2000	1,291.43
2001	1,657.18
2002	1,557.53
2003	1,532.03
2004	1,686.90
2005	1,752.57
2006	1,207.66
2007	1,321.84
2008	2,078.34
2009	1,686.11
2010	2,191.60
2011	2,548.29
2012	1,420.94

## **Appendix C: Visual Assessment Report**



**Dairy Green Ltd**

Practical Engineering Solutions  
Consents, Effluent, Stock water, Irrigation  
Design through to Installation

# **EFFLUENT POND VISUAL INSPECTION**

**Titipua Partnership Ltd**

**Hedgehope Block Road  
Pebble Hills**

24 June 2021

**Q SCANDRETT  
DAIRY GREEN LTD**

# Visual Pond Inspection

## Introduction

This report is to satisfy the permitted activity status described in Environment Southland's decision version of the Water and Land Plan, Rule 32 D, clause (a) (2), which states for existing agricultural effluent storage facilities, "certified by a Suitably Qualified Person in accordance with Appendix P within the last three years as: (a), having no visible cracks, holes or defects that would allow effluent to leak from the effluent storage facility".

## Methodology

The methodology used is aimed at detecting obvious physical defects that are causing or could cause leakage.

It involves a physical inspection of the lining material above the liquid height, the crest and external batters, if any. It also considers the likely failure mode for the type of containment structure being inspected. If there is a drop test report available, it will be assumed that this report confirms the performance of the pond batters and floor surfaces below liquid level since these surfaces cannot be observed unless the pond is empty.

For synthetically lined ponds, where there is a leak detection drainage system installed the inspection piezo will be checked where possible. The condition of the lining membrane and its anchoring will be recorded. As well the material creating any embankment and its stability will be noted and any items of maintenance that may be required.

A visual inspection cannot record faults that are not observable which could include unsatisfactory material below the liquid level or underneath a synthetic liner or in the core of the bank. It doesn't include an assessment of bank performance in an earthquake or calculated internal and external batter performance under the normal range of operating conditions that a pond has to perform under.

## POND

The effluent pond and sludge beds for Titipua Partnership Ltd are located south of the dairy shed on the property at 425 Hedgehope Block Road and were inspected by request on the 16<sup>th</sup> June 2021 with details recorded as follows:

## Observations

The pond is rectangular in shape consisting of two constructed banks and two banks formed predominantly in cut. The east bank inside top dimension is approx. 47 m long and north bank approx. 30 m long. The inflow to the storage pond is in the northeast corner of the pond with gravity inflow via a PVC pipe from the sludge beds with liquid passing through the weeping walls prior. The pond bank crests consist of a clayey silt subsoil with the wider sludge bed and pond area fenced to exclude stock.

The following aerial view shows the site layout.

Figure 1: Aerial view of the dairy shed, sludge beds and pond.



### Soils

Topoclimate records the pond to be situated within the Pukemutu soil type. The pond's bank crest material would indicate the pond has been constructed in a clayey silt soil type which is typical of the Pukemutu soil. These soils have a heavy silt loam texture and are formed from loess. The topsoil appears to have been stripped from the pond site and only subsoil used for bank construction.

### Banks

The pond banks appear to be formed from local material, and the pond looks to have been constructed with cut and fill to balance. The pond site is sloping from northwest to south east with the north bank in cut and the other three banks at differing heights above ground level. The core bank material is predominantly clayey silt. Crest widths were approx. 4 m. The bank crests appear to be stable with good grass cover.

## Batters

The batter slope for the internal batters was visible for the top two thirds of the pond's depth due to the low level of the pond, these were estimated to be 2.0H:1V. The inside batter slope that was visible looked to be stable with no slumping or bulges identified. The external batter slopes have good grass cover, no defects were identified.

## Liner

The pond looks to have been lined with 1.5 mm EPDM. The internal batter surfaces above liquid level were inspected looking for defects or holes. There were no defects identified that would allow effluent to leak from the pond. No seepages were identified around the outside of the pond. The pond has gas venting and leak detection drainage.

Photographs of each pond batter and bank are appended.

## Comments

The pond was approx. two thirds empty which allowed an inspection of the majority of the internal bank batters. The internal and external batters are stable, there were no defects identified that would allow effluent to leak from the pond.

.....  
*Author*  
Q Scandrett  
Agricultural & Engineering Consultant  
Dairy Green Ltd

.....  
*Reviewer*  
J S Scandrett  
Agricultural & Engineering Consultant  
Dairy Green Ltd

## POND PHOTOGRAPHS

### West Bank

The west bank internal batter slope view looking south.



### East Bank

The east bank, view looking north.



### **North Bank**

The north bank and batter slope view looking east.



### **South Bank**

The south bank internal batter slope and bank crest view looking east.



## **Sludge Beds:**

The property has two parallel sludge beds, with parallel weeping walls that divide the beds, these service the dairy shed effluent. Effluent gravity flows in from the dairy shed and yard. Liquid effluent passes through the weeping walls and gravity flows via PVC pipe to the storage pond.

The sludge beds have been constructed predominantly in cut with the banks and internal batters constructed from the material in-situ. The sludge beds have been lined with a clayey silt loam that was stripped from the site. The floor has approx. 150 mm depth of concrete overlying the clay lining. The sludge beds internal batters are approx. 1H:1V, the batter slopes look to be stable with some material having been removed during cleaning out over the life of the structure. The south bed had not long been emptied prior to the visual inspection which allowed the internal surfaces of the structure to be inspected. The north bed will need to be emptied when soil conditions allow in spring to allow inspection. The weeping walls have sufficient concrete footing to ensure they work effectively and to prevent erosion. The inlet plumbing to both beds discharges onto concrete to prevent erosion from the effluent. There does not appear to be any holes, cracks or defects that would allow effluent to leak from the structure. No seepages were identified around the external batters of the structure.

## **Sludge Beds Photos:**

South bed, south bank, view looking east.



West end of the south bed, view looking north.



East end of the south bed looking north.





## **Appendix D: Peer Review of Visual Assessment Report**

Consents Section  
Environment Southland  
Private Bag 90116  
Invercargill 9840

**Effluent Pond Visual Inspection – Titipua Partnership Ltd, Hedgehope Block Road  
Pebble Hills**

GeoSolve Ltd have been engaged by Dairy Green Ltd to review a visual inspection report at the above effluent pond.

This visual inspection was carried out in accordance with Environment Southland's decision version of the Water and Land Plan, Rule 32 D, clause (a) (2), which requires that existing agricultural effluent storage facilities are *"certified by a Suitably Qualified Person in accordance with Appendix P within the last three years as: (a), having no visible cracks, holes or defects that would allow effluent to leak from the effluent storage facility"*.

I have reviewed the report dated 8 June 2021 and based on the provided information I consider that:

- Based on the descriptions and photographs within the report that there were no visible defects observed within the effluent pond or sludge beds, noting that it is recommended that the north sludge bed is inspected when emptied; and
- The effluent pond and sludge beds appear to meet the requirement in italics above and had no visible cracks, holes or defects that would allow effluent to leak it.

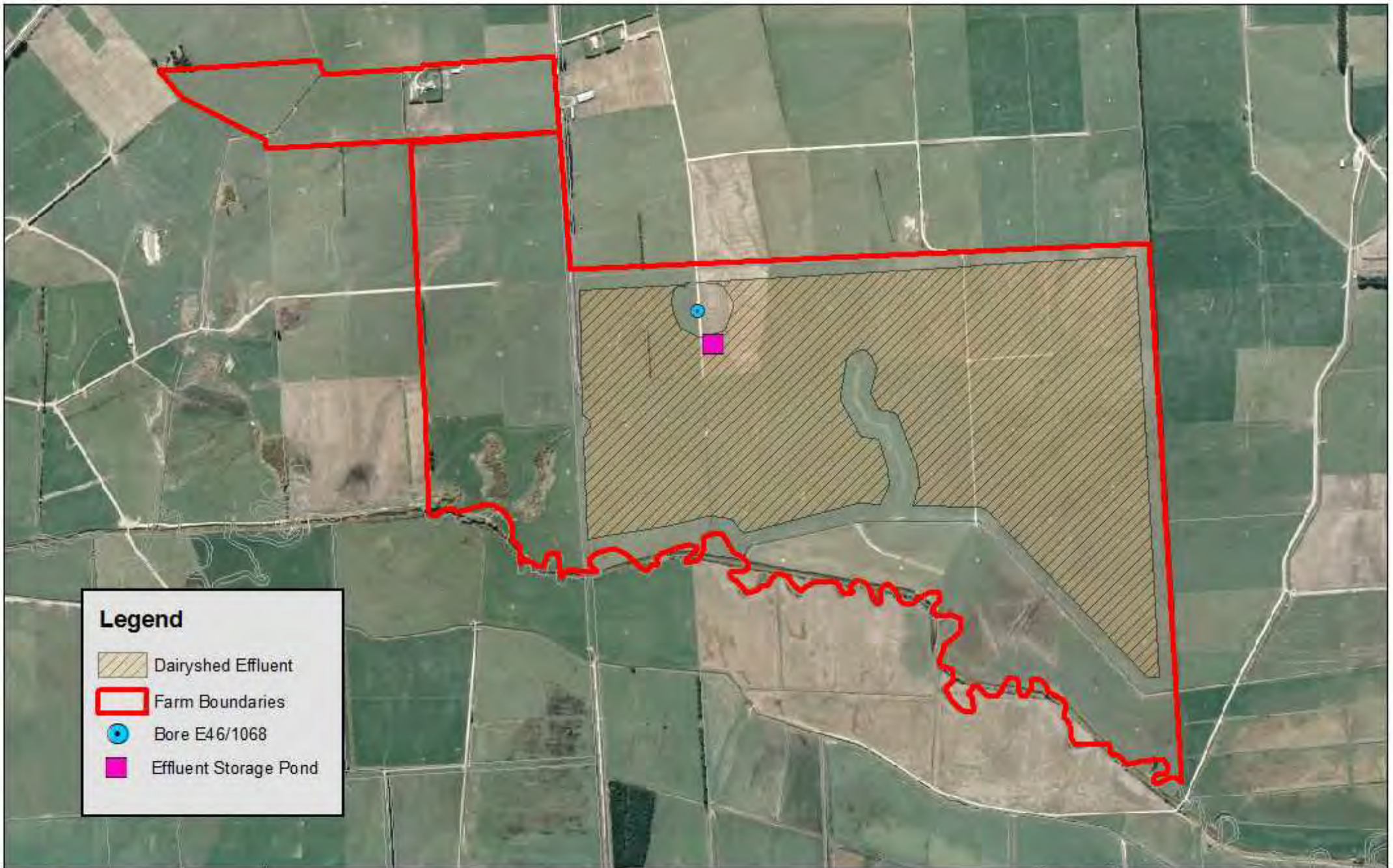
This report has been prepared for the benefit of Dairy Green Ltd with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose without our prior review and agreement.

Yours faithfully,



**Colin Macdiarmid**  
Senior Engineer –Geotechnical  
CPEng 1023934

## Appendix E: Map of Effluent Discharge Area



**Legend**

-  Dairyshed Effluent
-  Farm Boundaries
-  Bore E46/1068
-  Effluent Storage Pond



**Appendix 1 Map**  
**Titipua Limited Partnership A PP-301081-V1 and A PP-301082-V1**

Date: 15/09/2014



DISCLAIMER  
 While every effort has been made to ensure the content is correct, Environment Southland cannot guarantee the accuracy of the data. This information should not be relied in any manner without consultation.  
 Aerial Photography dated 2/2007 to 24/03/2011.  
 Copyright TerraLink International Limited  
 DATA SOURCE: GIS 2014



**Mo Topham**



Southland

Ph: 027 279 7449

Email: mo.topham@outlook.com

## File Note: Titipua Ltd Partnership – Pasture Grown June 2021

### 1.0 Supporting information to this report:

This file note is not a standalone report. It is intended to be read in conjunction with:

- The Overseer modelling report, dated 23<sup>rd</sup> March 2021 titled “Titipua Ltd Partnership – OverseerFM farm system modelling to support a consent application for expanded dairy”. This report has been attached to this file note.

### 2.0 Purpose of this report:

The Overseer Nutrient Budget Review, completed by Nicky Watt of Irricon raised points of clarification over the pasture grown estimates in the proposed nutrient budget scenario when compared to that estimated in the current dairy and Schrama block scenarios. This report seeks to explain the pasture grown figures to give council confidence that they are reasonable.

### 3.0 Modelled pasture grown results:

Table 1 below has been completed using information from the Overseer modelling report (section 1.1 and appendix 2 in that report). It shows the estimated pasture grown in each of the scenarios modelled – current dairy, Schrama block and the proposed dairy system.

*Table 1. Estimated pasture grown figures in the current, Schrama and proposed system scenarios as per the Overseer report, dated 23<sup>rd</sup> March 2021.*

	<b>Current system</b>	<b>Schrama Block</b>	<b>Proposed system</b>
<b>Pasture grown (TDM/ha)</b>	16.8	11.2	16.1
<b>N Fertiliser applied (kgN/ha)</b>	239	18	166 (average for pastoral area) 175 (non Effluent areas) 154 (effluent areas)

### 4.0 Overseer modelling process

Overseer calculates pasture grown from the data inputted using a back calculation and an assumed pasture quality. Overseer is not able to check the feasibility of these pasture production estimates and therefore the user must check them.

For the Titipua Ltd Partnership, input data was collected for the last three seasons and then averaged to reduce the impact of one seasons climatic conditions during the period.

As described in the Overseer modelling report, detailed input data for the Schrama block was not available due to the death of the previous owner. Therefore, a nutrient budget has been created

using data from the Beef and Lamb NZ economic survey alongside information available from Google Earth and the purchaser. The property has been modelled in a conservative approach that resulted in a pasture grown estimate at the lower end of the expected range. It should be noted that if a conservative approach had not been taken it would have resulted in higher nutrient losses, and thus an easier threshold for the Titipua Ltd Partnership to reach.

The proposed dairy system model is the Titipua Ltd Partnerships preferred future farm system. The inputs for the proposed system were discussed with the client at length to ensure that a viable system was modelled.

The Schrama block, when compared to the current dairy platform, has the same soil types, drainage, topography, rainfall and temperature, and similar or better soil fertility.

In Southland there are significant differences between sheep and dairy grazing systems. Sheep farms tend to be set stocked for a significant part of the season and grazed to lower residuals. These practices influence growth rates, and result in lower growth rates than a dairy farming system. It is not relevant to make direct comparisons between sheep and dairy farming growth rates. It should be noted that Woodlands growth data is from a sheep farm, but as it uses “caged cuts” is not reflective of standard sheep grazing practices.

The Schrama block, given the same farm system, nitrogen use and pasture management, has the same potential to grow pasture as the current dairy farm. Therefore, the pasture grown estimate in the proposed scenario should be compared to the current dairy farm only (not the previous sheep grazing system).

#### 4.0 Interpretation of Overseer pasture grown estimates:

Section 4.1.1 of the Overseer modelling report discusses that the pasture grown estimations in Overseer for Southland dairy farms are higher than expected. I have included this section below:

*“It should be noted that the estimated pasture grown outputs from Overseer are higher than expected. Overseer uses a default value for ryegrass/white clover pasture quality irrespective of the land use and management. The default Overseer value in Southland ranges from 10.5 to 11.17 MJ ME/ kg DM depending on the month (reference: Characteristics of pasture, June 2018, D M Wheeler AgResearch Ltd). Pasture cuts from an Eastern Southland monitor farm show MEs of 11.5 to 12.2 (reference: Pasture growth and quality on Southland and Otago dairy farms, D. E. Dalley and T. Geddes, DairyNZ, NZ Grasslands Publication 2012).*

*The Overseer default values have been used throughout the entirety of this modelling as the Best Practice Data Input Standards state that “there needs to be a very good long-term average evidence of clover content, pasture utilisation, pasture N content and pasture quality to justify changes from the default OVERSEER values. This level of information would be rare.”*

*To ensure that comparisons are valid between the baseline and proposed the same method has been used to ensure that an “apples with apples” approach is taken.”*

The Overseer Nutrient Budget Review completed by Irricon also noted that Overseer assumes a lower ME (metabolizable energy) than that found in the South Island. The lower ME assumed results in pasture grown estimates that are higher than expected.

Table 2 below shows the estimated pasture grown figures for the dairy scenarios at 10.8ME (as per the average of the Overseer assumed pasture quality) and at 11.85ME (as per the average of the pasture quality measured by Dalley and Geddes, 2012).

*Table 2. Pasture grown estimates taken directly from Overseer compared to an updated pasture grown figure using pasture quality figures measured on Southland dairy farms.*

	Current system	Schrama Block	Proposed system
<b>Overseer Pasture grown estimate – 10.8 MJME/kgDM (TDM/ha)</b>	16.8	11.2	16.1
<b>Updated pasture grown estimate – 11.85MJME (TDM/ha)</b>	15.3	NA	14.7

Therefore, the pasture production estimated by Overseer and corrected for Metabolisable Energy content is 15.3TDM/ha and 14.7TDM/ha on the current and proposed dairy system scenarios, respectively.

## 5.0 Expected pasture grown in Southland

Pasture production has been measured at the Woodlands Research Station on a fortnightly basis since 2000. The trial is operated in a nil nitrogen, optimal soil fertility system. The results of these measurements are publicly available, and I note that the Irricon report referenced a paper written about this trial which averaged pasture production from 2001 – 2012. Recent data released by the Woodlands Research Station including the years 2013 - 2021 showed that the average annual pasture production for this trial is now 13.0 TDM/ha (with no nitrogenous fertiliser input).

Pasture production in the current and proposed dairy farm scenarios is 2.3 and 1.7 TDM/ha higher respectively than the Woodlands Research Station average. This difference can be explained by nitrogen fertiliser pasture growth. As shown in Table 1, the current and proposed dairy farm scenarios included fertiliser nitrogen use of 239 and 166kgN/ha respectively. At a 10:1 response rate (10kgDM per 1kgN applied per ha), we would expect that the current and proposed would grow 2.39TDM/ha and 1.66TDM/ha more than the Woodlands Research Station. **This equates to an expected pasture grown of 15.39TDM/ha and 14.66TDM/ha on the current and proposed system respectively.**

## 5.0 Conclusions:

Due to differences in pasture management and its effect on pasture production, it is not justifiable to directly compare pasture grown figures rates for a sheep and dairy system. This comparison, by Irricon has led to incorrect conclusions regarding robustness of the modelling.

Pasture production is estimated by Overseer using a back calculation and an assumed pasture quality. Overseer overestimates pasture production on Southland dairy farms due to an under estimation of pasture quality. After correcting for this error, Overseer estimates pasture production on the current and proposed scenarios to be 15.3 and 14.7TDM/ha respectively.

The Woodlands Research Station has measured pasture production for the last 20yrs. The average annual pasture production on a Nil Nitrogen site is 13.0TDM. Considering the nitrogen applied to the current and proposed system, and a 10:1 response rate, we would expect pasture production on the Titipua Ltd Partnership property to be 15.39 and 14.66TDM/ha in the current and proposed systems respectively.

Given that the corrected Overseer pasture grown estimates are within 0.1TDM/ha of the Woodlands + nitrogen estimates, it can be concluded that the pasture grown is feasible and sensible.



## **Attachment 3**

# **Forest & Bird Submission**

## Forest & Bird Submission on APP-20211092 (Titipua Limited Partnership)

28 January 2022

### Submitted online

[esconsents@es.govt.nz](mailto:esconsents@es.govt.nz)



### From:

Royal Forest and Bird Protection Society of New Zealand (**Forest & Bird**)

### Contact:

Rick Zwaan

Regional Conservation Manager Otago Southland

[r.zwaan@forestandbird.org.nz](mailto:r.zwaan@forestandbird.org.nz)

021 845 587

PO Box 6230, Dunedin North, Dunedin 9059

### *Introduction*

1. Forest & Bird is New Zealand's leading independent conservation organisation, which has played an important role in preserving New Zealand's environment and native species since 1923. We are independently funded by private subscription, donations, and bequests. Our mission is to protect New Zealand's unique ecological values, flora and fauna, and natural habitat through the sustainable management of indigenous biodiversity, natural landscapes, rivers, lakes, and coastal environments.
2. Forest & Bird opposes Titipua Limited Partnership's application for Land Use Consents, Discharge permit, and Water Permit for dairy farm operations at 354 Hedgehop Block Road, Southland (**APP-20211092**).
3. Forest & Bird is not a trade competitor
4. Forest & Bird is willing to participate in any pre-hearing mediation and wishes to appear in person at any hearing
5. Forest & Bird has not had the opportunity to directly assess the site of the proposed activity ourselves and relies on the application documents and notification documents.

### *Context of degraded waterbodies in Southland*

6. Many of the waterbodies in Southland are known to be degraded including the Makarewa River<sup>1</sup> which the site drains into. The degraded state of the

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<sup>1</sup> [ref s95 report/envi southland

waterways negatively impacts on the habitats of threatened native fish and desperately needs improving.

7. Recent evidence suggests significant reductions in contaminant losses of nitrogen (N) phosphorus (P) and sediment are needed to improve the health of degraded waterways throughout Southland. Recent science reports commissioned by Environment Southland for the People, Water and Land programme - Te Mana o te Tangata, te Wai, te Whenu highlight that N & P need to reduce by 70% to meet the freshwater objectives in the next 25 years.<sup>2</sup> Assuming a straight-line reduction, over the 10year consent period proposed a proportional contribution would be to reduce losses by 28% over the duration of the consent.
8. The Section 95 report (s95) demonstrate that the proposed activities will result in more than minor in parts and the mitigations proposed are not sufficient to mitigate the negative effects on freshwater quality.
9. In appropriate dairying is known to have significant negative effects on freshwater quality with any intensification of such activity at odds with efforts to improve freshwater quality in Southland.
10. While Forest & Bird recognises that the impact on climate change is not directly able to be assessed under the current RMA process, it remains concerned that expanding dairy cow numbers will have a detrimental impact on the ability to reduce methane emissions to meet what is required under domestic and international agreements to keep warming below 1.5 degrees. The resulting climate change if this is goal is not meet will have significant detrimental effects on Southland, with effects such as increasing severity of storms and flooding impacting the ongoing viability of activities such as farming.

#### *Inadequate mitigation measures*

11. The application relies heavily on the mitigation proposed by a constructed wetland. Yet the application offers no detail of how the wetland would be constructed, the timeframes for growth of vegetation which will do the heavy lifting of reducing loss of contaminants, nor does it contain detail of how the wetland will cope with excessive overland flows during periods of high rainfall. Without this detail it is impossible to assess whether or not the assumed removals will eventuate by the time the activity occurs. As this mitigation measure is only proposed to start to be constructed when the activity commences it is highly likely the effectiveness will be reduced for a number of

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<sup>2</sup> <https://waterandland.es.govt.nz/science-and-economics/science-modelling>

years until vegetation is established. During this time, increased losses of contaminants will continue to degrade the catchments adding cumulative effects to an already stressed ecosystem.

12. Even if we are to assume the wetland is constructed to effectively reduce contaminant losses, the s95 report highlights the inadequacy of relying on Overseer and incorrect calculations made in the application with the report showing the actual mitigation is likely to be far less than the applicant assumes. The s95 report calculates 79.75 to 256.75kg/yr less nitrogen removed or, in other words, more pollution in the waterways than the application assumes. This is a significant disparity and the range highlights the high uncertainty of how effective the mitigation measures proposed would be.
13. The s95 report also shows that the enhanced wetland proposed as a key mitigation measure would not capture contaminants from the Scharama block – a key area of expansion for the dairy farm. This area appears to have no avoidance mitigation proposed for the loss of nitrogen and other contaminants into waterways. This will lead to continuing degradation of waterways and the habitats they provide which, as the s95 report identifies are already degraded:

*The water quality in the receiving environment is degraded, in particular the Hedgehope Stream 20m upstream of the Makarewa River confluence sits in the worst 25% of all sites for E.coli and in the worst 50% of all sites for Total Nitrogen and Total Phosphorus.<sup>3</sup>*

#### *No consideration of climate change*

14. Allowing an increase in dairy cow numbers will contribute more greenhouse gas emissions via methane emissions and nitrous oxide emissions. This will contribute to climate change which is known to have a detrimental effect on Southland and ongoing viability of activities such as farming in the region.<sup>4</sup> The effects of these have not been addressed by the application and are at odds with Environment Southland's Draft Climate Action Plan 2020-2022 goal to support the Government's goal of net zero greenhouse gas emissions by 2050 and Local Government Leaders' Climate Change Declaration.<sup>5</sup>

#### *Inconsistent with the Act, NPS-FM, RPS, pSWLP*

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<sup>3</sup> S95 report, p. 14

<sup>4</sup> <https://environment.govt.nz/facts-and-science/climate-change/impacts-of-climate-change-per-region/projections-southland-region/>

<sup>5</sup> <https://www.es.govt.nz/environment/climate-change>


15. Forest & Bird agrees with the policy analysis laid out in the s 95 report.
16. The application is inconsistent with the National Policy Statement on Freshwater, in particular Objective 1, Policies 1, 2, 3, 9, 10, 11, 12, 13, 14, and 15.
17. The proposed activities do not support the objectives in the Southland Regional Policy Statement in particular Objectives WQUAL.1 and WAUAL.2 which aim to halt the decline in water quality and improve water quality in Southland generally and in lowland areas specifically. The application does not meet the requirements of related Policies WQUAL.1 or WQUAL.2.
18. The s 95 report has detailed where the application does not meet the objectives and policies of the proposed Southland Water and Land Plan (pSWLP). Forest & Bird agrees with this analysis.
19. Allowing more discharges of pollution into waterways is at odds with several parts of the Resource Management Act, such as s7.

*Relief sought:*

20. In the first instance Forest & Bird seeks that the application is declined.
21. If the application is not declined then improved mitigation measures must be put in place that independent experts verify will not result in any increase in contaminants in the receiving waterbodies and the mitigation measures contribute to a reduction in existing contaminants by the time the increased dairying activities commence.

## **Attachment 4**

# **Te Ao Marama Inc Submission**



31 January 2022

Consents Manager  
Private Bay 90116  
Invercargill

Tēnā Koe,

**RE: Submission on Resource consent application – APP-20211092**

Please find attached a submission lodged, on behalf of Waihōpai Rūnaka on Resource Consent applications for the Dairy Farm operation by Titipua Limited Partnership.

We trust the information contained within the submission is sufficient; however, should you wish to discuss any aspect further, please do not hesitate to contact me.

Nāhaku noa nā,



Stevie-Rae Blair  
Te Ao Marama Inc.  
Kaitohutohu Taiao

To: Environment Southland  
Private Bay 90116  
Invercargill

1. This is a submission on the application (Resource Consent Application APP-20211092) for a suite of consents related to a dairy farming operation at 354 Hedgehope Bloack Road, Hedgehope.
2. The submission relates to the applications in their entirety (Appendix A). Waihōpai Rūnaka are **opposed** to the granting of the applications.
3. Waihōpai Rūnaka wishes to be heard in support of its submission.
4. If others are making a similar submission, Waihōpai Rūnaka will consider presenting a joint case with them at a hearing.
5. Waihōpai Rūnaka is not a trade competitor for the purposes of section 308B of the Resource Management Act 1991.
6. A copy of this submission has been sent to the applicant.

**Signed** for and on behalf of Waihōpai Rūnaka.



Stevie-Rae Blair  
PO Box 7078  
South Invercargill,  
9844

31 January 2022



## Introduction

1. This submission is made on behalf of Waihōpai Rūnaka.

### *Papatipu Rūnaka*

2. The Te Rūnanga o Ngāi Tahu Act 1996 (the TRoNT Act) and the Ngāi Tahu Claims Settlement Act 1998 (the Settlement Act) give recognition to the status of Papatipu Rūnanga as kaitiaki and manawhenua of the natural resources within their takiwā boundaries.
3. The consent application proposals relate to the operation of a dairy farm within the takiwā of Waihōpai Rūnaka.
4. The rich cultural landscape of the Tatakura (Hedgehope), Makarewa and Lower Ōreti catchment. These include some of the oldest settlements in New Zealand (adjacent to the NRE estuary), the cultural stories of the travels of Tamatea and his waka Takitimu, the number and significance of wāhi tapu and archaeological sites; the large amount of Māori Land in this area, and the mahinga kai resources of this area.
5. The Tatakura, Makarewa and Lower Ōreti is an important landscape to Ngāi Tahu because of historical (as indicated above) and contemporary associations. These associations include the formation of landscape, wāhi ingoa (place names), mahinga kai, wāhi tapū and archaeological sites.
6. The tupuna had considerable knowledge of whakapapa, traditional trails and tauranga waka, places for gathering kai and other taonga, ways in which to use the resources of the Oreti, the relationship of people with the river and their dependence on it, and tikanga for the proper and sustainable utilisation of resources. All of these values remain important to Ngai Tahu today.
7. This cultural, spiritual, historic, and traditional association is recognised by the crown and is a Statutory Acknowledgement (See attachment 1) under the Ngāi Tahu Claims Settlement Act, 1997.
8. Ngāi Tahu is supportive of development within its takiwā, provided activities are undertaken in a way that respects the environment where the activity is to be undertaken and do not adversely affect Ngāi Tahu cultural values, customs and their traditional relationship with land and water.

## General Position

9. Waihōpai Rūnaka, as kaitiaki, are responsible for protecting the mana and mauri of the Oreti Awa and its tributaries. We are concerned with the current state of water quality in the catchment and have reservations that this application will maintain or improve the hauora of the Oreti.
10. Intensive farming has been identified as the main contributor<sup>1</sup> to the deterioration of our waterways and we believe enabling further intensification impacts us achieving our kaitiaki responsibilities.
11. Ngāi Tahu **opposes** the application for the following reasons:
  - Effects on cultural values, rights and interests

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<sup>1</sup> Snelder and Legard. 2014, Ewans 2018, Robertson et al. 2019

- Intensification of land
- Proposed mitigation measures do not adequately mitigate the effects on water quality

### **Decision sought**

12. Providing for te hauora o te wai requires targeted remedial action where degradation is found to be present, seeking improvement in environmental state over time. Waihōpai rūnaka are concerned that some mitigations have not been included as part of the application and therefore the application does not provide for the hauora o te wai.
13. Waihōpai Rūnaka seek that the application is declined due to appropriate mitigation measures not being included to reduce the impacts on water quality. However, if council was of the mind to approve the application, we would support appropriate mitigations that would improve water quality.

## STATUTORY ACKNOWLEDGEMENT FOR The Ōreti River

### Statutory Area

The statutory area to which this statutory acknowledgement applies is the river known as Oreti, the location of which is shown on Allocation Plan MD 123 (S.O. 12262).

### Preamble

Under section 206, the Crown acknowledges Te Runanga o Ngai Tahu's statement of Ngai Tahu's cultural, spiritual, historic, and traditional association to the Oreti River, as set out below.

### Ngai Tahu Association with the Oreti River

The Oreti River traverses a significant area of Murihiku, stretching from its mouth at Invercargill almost to the edge of Whakatipu-wai-maori (Lake Wakatipu). As such, it formed one of the main trails inland from the coast, with an important pounamu trade route continuing northward from the headwaters of the Oreti and travelling, via the Mavora or Von River Valley, to the edge of Wakatipu and onto the Dart and Routeburn pounamu sources. Indeed, pounamu can be found in the upper reaches of the Oreti itself.

The tupuna had considerable knowledge of whakapapa, traditional trails and tauranga waka, places for gathering kai and other taonga, ways in which to use the resources of the Oreti, the relationship of people with the river and their dependence on it, and tikanga for the proper and sustainable utilisation of resources. All of these values remain important to Ngai Tahu today.

The kai resources of the Oreti would have supported numerous parties venturing into the interior, and returning by mokihi (vessels made of raupo), laden with pounamu and mahinga kai. Nohoanga (temporary campsites) supported such travel by providing bases from which the travellers could go water fowling, eeling and catching inaka (whitebait), and were located along the course of Oreti River.

There were a number of important settlement sites at the mouth of the Oreti, in the New River estuary, including Omaui, which was located at the mouth of the Oreti, where it passes the New River Heads. Oue, at the mouth of the Oreti River (New River estuary), opposite Omaui, was one of the principal settlements in Murihiku. Honekai who was a principal chief of Murihiku in his time was resident at this settlement in the early 1820s, at the time of the sealers. In 1850 there were said to still be 40 people living at the kaik at Omaui under the chief Mauhe.

As a result of this pattern of occupation, there are a number of urupa located at the lower end of the Oreti, in the estuarine area. Urupa are the resting places of Ngai Tahu tupuna and, as such, are the focus for whanau traditions. These are places holding the memories, traditions, victories and defeats of Ngai Tahu tupuna, and are frequently protected by secret locations.

The mauri of the Oreti represents the essence that binds the physical and spiritual elements of all things together, generating and upholding all life. All elements of the natural environment possess a life force, and all forms of life are related. Mauri is a critical element of the spiritual relationship of Ngai Tahu Whanui with the river.

#### Purposes of Statutory Acknowledgement

Pursuant to section 215, and without limiting the rest of this schedule, the only purposes of this statutory acknowledgement are—

- (a) To require that consent authorities forward summaries of resource consent applications to Te Runanga o Ngai Tahu as required by regulations made pursuant to section 207 (clause 12.2.3 of the deed of settlement);

## **Attachment 5**

# **Mo Topham's File Note: Updating Overseer FM Outputs to Version 6.4.2 on behalf of the Applicant**



**Mo Topham**



Southland

Ph: 027 279 7449

Email: mo.topham@outlook.com

## File Note: Titipua Ltd Partnership – Updating OverseerFM outputs to version 6.4.2

March 2022

### 1.0 Supporting information to this report:

This file note is not a standalone report. It is intended to be read in conjunction with:

- The Overseer modelling report dated 23<sup>rd</sup> March 2021 titled “Titipua Ltd Partnership – OverseerFM farm system modelling to support a consent application for expanded dairy”.
- The File Note, dated June 2021 titled “File Note: Titipua Ltd Partnership – Pasture grown”
- The File Note, dated September 2021 titled “File Note: Titipua Ltd Partnership – Overseer version change”
- Titipua Ltd Partnership – Wetland mitigation calculations (Oct 2021)
- Landpro Project Memorandum written by Andrea Richardson (Nov 2021)
- The File Note, dated October 2021 titled “File Note: Titipua Ltd Partnership – Additional mitigation strategies”

These reports have been attached to this file note.

### 2.0 Purpose of this report:

Since the File note dated October 2021 titled “File Note: Titipua Ltd Partnership – Additional mitigation strategies” was written, there has been a new version of OverseerFM released – 6.4.2. Environment Southland have requested that the OverseerFM models for the Titipua Limited Partnership be rerun under the new version, and the results be presented. The calculations outside of Overseer have also been updated to ensure continuity of the application.

### 3.0 Previously modelled losses as per file note dated October 2021:

In the most recent file note, dated October 2021, the nutrient losses were quantified under Overseer version 6.4.1. These were shown in Tables 9 and 10 of that report, and are repeated below:

*Table 1. Estimated nitrogen and phosphorus losses from the current system using Overseer version 6.4.1 (as per file note dated October 2021)*

	<b>Current Dairy Platform</b>	<b>Schrama’s block</b>	<b>Total current</b>
<b>Area (ha)</b>	181.5	84.2	265.7
<b>Total Farm N Loss (kg)</b>	10349	1,685	12,034
<b>N Loss/ha (kgN/ha/yr)</b>	57	20	45
<b>Total Farm P Loss (kg)</b>	458	191	649
<b>P loss/ha (kgP/ha/yr)</b>	2.5	2.3	2.4
<b>Pasture Grown (tDM/ha)</b>	16.8	11.2	

Report disclaimer: This file note is intended to be read alongside the reports listed in section 1.0 of this report. Details of how the properties are operated currently, and how the property will be operated going forward have been gathered from the farm owner. Where accurate data was unavailable, conservative assumptions have been made using professional judgement and industry benchmarks.

Table 2. Estimated nitrogen and phosphorus losses from the current and proposed systems including calculations outside of Overseer (as per file note dated October 2021). This modelling utilises Overseer version 6.4.1

	Total current	Proposed	
<b>Area (ha)</b>	265.7	265.7	
<b>Total Farm N Loss (kg)</b>	12,034	11,180 <i>(11,075 modelled plus 581 baleage grass wintering minus 476 wetlands calculated outside OverseerFM)</i>	7.1% decrease
<b>N Loss/ha (kgN/ha/yr)</b>	45	42	
<b>Total Farm P Loss (kg)</b>	649	579 <i>(623 modelled minus 5 baleage grass wintering minus 39 wetlands calculated outside OverseerFM)</i>	10.8% decrease
<b>P loss/ha (kgP/ha/yr)</b>	2.4	2.2	
<b>Pasture Grown (tDM/ha)</b>		16.1	

Note:

1. Estimated pasture grown figures are higher than expected. This is discussed in section 4.1.1 of the "Overseer modelling report, dated 23<sup>rd</sup> March 2021" attached to this file note
2. Calculations outside of OverseerFM have been required in the proposed system modelling. These are explained in full in the file note dated October 2021 and in section 4.2. of the "Overseer modelling report, dated 23<sup>rd</sup> March 2021" attached to this file note. Updates to these calculations are explained within this report.

#### 4.0 Updated modelling under Overseer version 6.4.2

A new version of Overseer (6.4.2) was released on the 20<sup>th</sup> December 2021. The Overseer website noted that the "OverseerFM model release 6.4.2 addresses defects in model implementation identified by feedback from our users." Of the defects identified, there were two that affected the modelling completed for this application. These defects are both related to how Overseer distributes supplements throughout the season and the downstream impact of this on estimated losses.

The Titipua Limited Partnership Overseer files have been rerun under Overseer version 6.4.2 with the outputs shown below. Outputs shown in red show a change to those given in Tables 1 and 2.

Note: calculations outside of Overseer have NOT been updated in these tables.

A full description of the farm system is given within the file note, written October 2021, titled "File Note: Titipua Ltd Partnership – Additional mitigation strategies". No changes have been made to this.

Table 3. Estimated nitrogen and phosphorus losses from the current system using Overseer version 6.4.2

	Current Dairy Platform	Schrama's block	Total current
Area (ha)	181.5	84.2	265.7
Total Farm N Loss (kg)	10151	1,658	11809
N Loss/ha (kgN/ha/yr)	56	20	44
Total Farm P Loss (kg)	458	191	649
P loss/ha (kgP/ha/yr)	2.5	2.3	2.4
Pasture Grown (tDM/ha)	16.8	11.2	

Table 4. Estimated nitrogen and phosphorus losses from the current and proposed systems including calculations outside of Overseer. This modelling utilises Overseer version 6.4.2. Please note: The calculations outside of Overseer have NOT been updated in this table.

	Total current	Proposed	
Area (ha)	265.7	265.7	
Total Farm N Loss (kg)	11809	10,752 <i>(10,647 modelled plus 581 baleage grass wintering minus 476 wetlands calculated outside OverseerFM)</i>	9.0% decrease
N Loss/ha (kgN/ha/yr)	44	40	
Total Farm P Loss (kg)	649	579 <i>(623 modelled minus 5 baleage grass wintering minus 39 wetlands calculated outside OverseerFM)</i>	10.8% decrease
P loss/ha (kgP/ha/yr)	2.4	2.2	
Pasture Grown (tDM/ha)		16.1	

Note:

1. Estimated pasture grown figures are higher than expected. This is discussed in section 4.1.1 of the "Overseer modelling report, dated 23<sup>rd</sup> March 2021" attached to this file note
2. Calculations outside of OverseerFM have been required in the proposed system modelling. These are explained in full in the file note dated October 2021 and in section 4.2. of the "Overseer modelling report, dated 23<sup>rd</sup> March 2021" attached to this file note. Updates to these calculations are explained within this report.

## 5.0 Updating the outside of Overseer calculations

The proposed system estimated losses included the use of calculations outside of Overseer. These calculations have been recalculated below utilising information from Overseer version 6.4.2.

### 6.1 Baleage grass wintering:

As explained in the March 2021 report "OverseerFM is likely to underestimate nitrogen losses as OverseerFM is not able to adequately reflect the on-farm realities of this system. OverseerFM assumes that the pasture plants will regrow post grazing and take up urinary N from the wintering activity. However, due to the soil type and climate on the applicant's property, the plants are not



viable following the winter grazing. As a result, the area is cultivated and regrassed in spring. I am unaware of any research that has quantified the impact of baleage grass wintering in terms of nitrate and phosphorus loss. I have therefore completed a desktop modelling exercise that attempts to estimate the nutrient losses from this system more accurately.”

In the March 2021 report, I explained that I had created an Overseer file that showed the baleage grass area as a very low yielding kale crop. This allowed me to add a defoliation and regrassing event to Overseer and ensured that overseer would assume no uptake of urinary N between grazing of the crop and the resowing of the pasture. Further details on how this was modelled can be found in the March 2021 report in section 4.2.1.

I have rerun the same calculation following the update of Overseer to Version 6.4.2. The results are summarised in the table below. Again, where applicable, changes in losses as compared to version 6.4.1 are shown in red while the previous presented figures are shown in black.

Table 5. Total nitrogen and phosphorus losses for the kale or baleage/grass area (10ha)

	Nitrogen losses (kg N) (version 6.4.1 in black) (version 6.4.2 in red)	Phosphorus losses (version 6.4.1 in black) (No changes for version 6.4.2)
Pasture baleage system	343 566	19
Kale system	924 1169	14
Difference	603 kgN higher loss in the Kale system (581 in version 6.4.1)	5kgP lower loss in the Kale system

Therefore, it is predicted that the losses from the grass baleage wintering system will be **603 kgN** higher and **5kg P** lower than estimated in the OverseerFM Proposed scenario.

## 6.2 Installation of a wetland:

Calculations on the potential mitigation efficiency of a constructed wetland were given in the file note “Titipua Ltd Partnership – Wetland mitigation calculations (Oct 2021)”. These calculations were completed based on block N and P losses estimated in Overseer version 6.4.1. For a complete description of the assumptions and background information please refer to the earlier file note.

The tables below have been copied and updated from the previous file note “Titipua Ltd Partnership – Wetland mitigation calculations (Oct 2021)”. I have rerun the same calculations following the update of Overseer to Version 6.4.2. Again, where applicable, changes in losses as compared to version 6.4.1 are shown in red while the previous presented figures are shown in black.

Table 6. Estimated nitrogen mitigation because of the wetland installation (Overseer version 6.4.2 – copied and updated from file note “Titipua Ltd Partnership – Wetland mitigation calculations (Oct 2021)”.

Overseer block name	Area of block captured by wetland (ha)	OverseerFM estimated nitrogen leaching loss (version 6.4.1) (version 6.4.2 in red) (kgN/ha)	Reduction in N leaching due to wetland (estimated from wetland resource) (%)	Total reduction (Ha x kgN/ha x %) (kgN) (version 6.4.1) (version 6.4.2 in red)
Non-Eff, Rolling – Puke, Apar	21.4	39.4 38	38	320.4 309.0
Eff, Rolling – Puke, Apar	9.1	36.0 35	38	124.5 121.0
Non effective area (laneways and tracks) – the losses from this area are accounted for in “other sources” below.	3.5			
<b>Total block Nitrogen loss mitigated</b>	<b>34.0</b>			<b>444.9</b> <b>430.0</b>
Plus reduction in other sources losses	34/265.7	637 627	38	31.0 30.5
<b>Total farm Nitrogen loss mitigated</b>				<b>475.9</b> <b>460.5</b>

Table 7. Estimated phosphorus mitigation because of the wetland installation (Overseer version 6.4.2 – copied and updated from file note “Titipua Ltd Partnership – Wetland mitigation calculations (Oct 2021)”. NOTE: no changes in P loss estimated by Overseer version 6.4.2 when compared to version 6.4.1 and therefore no changes to the P loss mitigation calculation below.

Overseer block name	Area (ha)	OverseerFM estimated P loss (version 6.4.1) (version 6.4.2 in red) (kgP/ha)	Reduction in P loss due to wetland (estimated from wetland resource) (%)	Total reduction (kgP) (Ha x kgP/ha x %) (version 6.4.1) (version 6.4.2 in red)
Non-Eff, Rolling – Puke, Apar	21.4	2.14	48	22.0
Eff, Rolling – Puke, Apar	9.1	2.20	48	9.6
Non effective area (laneways and tracks) – the losses from this area are accounted for in “other sources” below.	3.5			
<b>Total block Phosphorus loss mitigated</b>	<b>34.0</b>			<b>31.6</b>
Plus reduction in other sources losses	34/265.7	115	48	7.1
<b>Total farm Phosphorus loss mitigated</b>				<b>38.7</b>

Therefore, it is predicted that the losses from the wetland will reduce losses from the catchment area by **461kg N** (previously 476kgN) and 39kgP per annum.

### 6.3 Cumulative effects of mitigations calculated outside of Overseer

Calculations outside of Overseer have been completed to quantify the impact of the baleage grass wintering and the wetland installation. The updated loss estimates are shown in the table below. Differences, as compared to Table 4 of this report are shown in **red**.

*Table 1. Estimated nitrogen and phosphorus losses from the current and proposed systems including calculations outside of Overseer. This modelling utilises Overseer version 6.4.1*

	Total current	Proposed	
<b>Area (ha)</b>	265.7	265.7	
<b>Total Farm N Loss (kg)</b>	11809	<b>10,789</b> <i>(10,647 modelled plus 603 baleage grass wintering minus 461 wetlands calculated outside OverseerFM)</i>	<b>8.6% decrease</b>
<b>N Loss/ha (kgN/ha/yr)</b>	44	<b>41</b>	
<b>Total Farm P Loss (kg)</b>	649	579 <i>(623 modelled minus 5 baleage grass wintering minus 39 wetlands calculated outside OverseerFM)</i>	10.8% decrease
<b>P loss/ha (kgP/ha/yr)</b>	2.4	2.2	
<b>Pasture Grown (tDM/ha)</b>		16.1	

Note:

1. Estimated pasture grown figures are higher than expected. This is discussed in section 4.1.1 of the "Overseer modelling report, dated 23<sup>rd</sup> March 2021" attached to this file note
2. Calculations outside of OverseerFM have been required in the proposed system modelling. These are explained in full in the file note dated October 2021 and in section 4.2. of the "Overseer modelling report, dated 23<sup>rd</sup> March 2021" attached to this file note. Updates to these calculations are explained within this report.

## 7.0 Conclusions:

The further modelling requested by the applicant has resulted in changes in the estimated losses of Nitrogen and Phosphorus.

Table 2. Estimated nitrogen and phosphorus losses from the current system using Overseer version 6.4.2

	Current Dairy Platform	Schrama's block	Total current
Area (ha)	181.5	84.2	265.7
Total Farm N Loss (kg)	10151	1,658	11809
N Loss/ha (kgN/ha/yr)	56	20	44
Total Farm P Loss (kg)	458	191	649
P loss/ha (kgP/ha/yr)	2.5	2.3	2.4
Pasture Grown (tDM/ha)	16.8	11.2	

Table 3. Estimated nitrogen and phosphorus losses from the current and proposed systems including calculations outside of Overseer. This modelling utilises Overseer version 6.4.2

	Total current	Proposed	
Area (ha)	265.7	265.7	
Total Farm N Loss (kg)	11809	10,789 <i>(10,647 modelled plus 603 baleage grass wintering minus 461 wetlands calculated outside OverseerFM)</i>	8.6% decrease
N Loss/ha (kgN/ha/yr)	44	41	
Total Farm P Loss (kg)	649	579 <i>(623 modelled minus 5 baleage grass wintering minus 39 wetlands calculated outside OverseerFM)</i>	10.8% decrease
P loss/ha (kgP/ha/yr)	2.4	2.2	
Pasture Grown (tDM/ha)		16.1	

Note:

1. Estimated pasture grown figures are higher than expected. This is discussed in section 4.1.1 of the "Overseer modelling report, dated 23<sup>rd</sup> March 2021" attached to this file note
2. Calculations outside of OverseerFM have been required in the proposed system modelling. These are explained in full in the file note dated October 2021 and in section 4.2. of the "Overseer modelling report, dated 23<sup>rd</sup> March 2021" attached to this file note. Updates to these calculations are explained within this report.



## **Draft Consent Conditions**

- 1. Discharge Permit**
- 2. Water Permit**
- 3. Land Use Consent (winter barn and feed pad)**
- 4. Land Use Consent (farming in the form of a dairy farm expansion)**
- 5. Land Use Consent (new effluent storage facility in the form of a herd home bunker)**



Cnr North Road and Price Street  
(Private Bag 90116  
DX YX20175)  
Invercargill

Telephone (03) 211 5115  
Fax No. (03) 211 5252  
Southland Freephone No. 0800 76 88 45

## Discharge Permit

Under Section 104B of the Resource Management Act 1991, a resource consent is granted by the Southland Regional Council to **Titipua Limited Partnership** of **354 Hedgehope Block Road, Hedgehope 9872** from **Date Consent Granted 2022**.

**Please read this Consent carefully, and ensure that any staff or contractors carrying out activities under this Consent on your behalf are aware of all the conditions of the Consent.**

### Details of Permit

Purpose for which permit is granted:	To discharge agricultural effluent to land from up to 600 cows via low rate travelling irrigator, umbilical system and slurry tanker.
Location	<ul style="list-style-type: none"> <li>- site locality Hedgehope Block Road, Hedgehope</li> <li>- map reference NZTM2000 1257620E 4869360N</li> <li>- physiographic zones Lignite Marine Terraces and Peat Wetlands</li> <li>- groundwater zone Makarewa</li> <li>- catchment Titipua Stream</li> <li>- FMU Oreti</li> </ul>
Legal description of land at the site:	Lot 2 DP 420431 and Lot 3 DP 1494
Expiry date:	<b>31 May 2032</b>

### Schedule of Conditions

#### General conditions

1. This resource consent shall not be exercised until Discharge Permit AUTH-301081-V1 is surrendered or has expired.
2. This consent shall be exercised in conjunction with Land Use Consent AUTH-20211092-04.

3. This consent authorises the discharge of dairy shed effluent and feed pad (“agricultural effluent”) onto land, via a land disposal system consisting of a sump, weeping wall, dual sludge beds, feed pad tank and a synthetically lined effluent storage pond to low rate travelling irrigator, umbilical system and slurry tanker, as described in the application (APP-20211092) for resource consent dated 11 May 2021<sup>1</sup>, additional application dated 30 August 2021<sup>2</sup>, additional application dated 6 December 2021<sup>3</sup> and further information dated 30 August 2021<sup>2</sup>. The activity shall be limited to:
- (a) the discharge to land of agricultural effluent generated from milking of up to 600 cows up to twice per day;
  - (b) the discharge to land of agricultural effluent via a low rate travelling irrigator;
  - (c) the discharge to land of agricultural effluent via a high rate umbilical system and slurry tanker as contingency measures;
  - (d) the discharge of agricultural effluent to an area of 93 hectares as per the plan attached as Appendix 1; and
  - (e) the discharge to land of feed pad effluent generated from the use of a feed pad by up to 120 cows between 1 August and 31 October (inclusive).

**Advice Note:** Routine monitoring inspections of this consent may occur up to two times a year. This number does not include any other required inspections.

4. Notwithstanding these conditions, this permit shall be exercised in accordance with the Collected Agricultural Effluent Management Plan. Where there is inconsistency between the Collected Agricultural Effluent Management Plan and the conditions of this consent, the conditions of this consent shall prevail.
5. The discharge shall not exceed:
- (a) a depth of application of 10 millimetres for each individual application, and an instantaneous rate of 10 millimetres per hour via a low rate travelling irrigator;
  - (b) a depth of application of 5 millimetres for each individual application via an umbilical system or slurry tanker.
6. Prior to the exercise of this consent, the Consent Holder shall:
- (a) measure the depth and instantaneous rate of application by the travelling irrigator as installed; and
  - (b) supply these measurements to the Consent Authority.
7. The minimum return period for the discharge of agricultural effluent to land shall be 28 days.
8. The discharge shall not occur when the moisture content of the soils is at or above field capacity.
9. Nitrogen loading onto any land area as a result of the exercise of this consent shall not exceed 150 kilograms of nitrogen per hectare per year.

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<sup>1</sup> Environment Southland Document ID: A654203

<sup>2</sup> Environment Southland Document ID: A697761

<sup>3</sup> Environment Southland Document ID: A723636



### Exclusions

10. This consent does not authorise the discharge of:
  - (a) dairy shed effluent collected during 1 June to 31 July; and
  - (b) effluent collected by a winter barn, silage pad or underpass.
11. No discharge shall occur within:
  - (a) 20 metres of any surface watercourse;
  - (b) 100 metres of any water abstraction point;
  - (c) 200 metres of any place of assembly or dwelling not on the subject property; and
  - (d) 20 metres from any property boundaries.

Where there is inconsistency between the plan attached as Appendix 1 and the conditions of this consent, the conditions of this consent shall prevail.

12. The stored or discharged agricultural effluent shall not enter any surface watercourse in any way, including:
  - (a) directly;
  - (b) indirectly;
  - (c) by overland flow;
  - (d) via entrainment by stormwater or run-off; or
  - (e) via a pipe.
13. The stored or discharged agricultural effluent shall not:
  - (a) form ponds or flow on the land surface, or
  - (b) cause contamination of water.
14. The stored or discharged agricultural effluent shall not cause any odour beyond the boundary of the site (see Appendix 1) that is offensive or objectionable in the opinion of the Council's Compliance Officer.
15. Spray drift beyond the boundary of the site shall not occur.

### Effluent storage

16. The discharge shall occur via an agricultural effluent storage pond of between 2,279 cubic metres and 2,320 cubic metres capacity.
17. The Consent Holder must maintain at least 500 mm of freeboard in the agricultural effluent storage pond at all times.

### System management

18. The Consent Holder shall notify the Consent Authority the identity of the Person in Charge of the agricultural effluent disposal system:
  - (a) prior to the first exercise of this consent, and
  - (b) no more than five working days following the appointment of any new Person in Charge.

19. The Consent Holder shall install and maintain:
  - (a) an operational alarm that alerts the Person in Charge to any system failure that could cause the over-application, overflow or spilling of agricultural effluent (e.g. sudden pressure drop, irrigator stoppage); and /or
  - (b) an operational automatic switch-off system that prevents any over-application or spilling of agricultural effluent.
20. Where the agricultural effluent reticulation system is installed in such a way that effluent can be siphoned when pumping ceases, the Consent Holder shall install and maintain an anti-siphon device in the agricultural effluent pipeline.
21. In the event of the failure or mismanagement of the agricultural effluent disposal system, or any other event that may result in a discharge of agricultural effluent that may have significant adverse effect on water quality, particularly in the region of the abstraction point of a registered drinking-water supply, the Consent Holder shall notify, as soon as reasonably practicable, the following:
  - (a) the Consent Authority (ph 03 211 5115 or 03 211 5225 after hours); and
  - (b) Southland District Council (ph 0800 732 732).

#### **Collected Agricultural Effluent Management Plan**

22. Within three months of the first exercise of this consent, the Consent Holder shall prepare and submit to the Consent Authority a Collected Agricultural Effluent Management Plan. The Collected Agricultural Effluent Management Plan shall:
  - (a) provide concise and clear direction to the Person in Charge and other staff on the operation of the agricultural effluent system;
  - (b) identify environmental risks of agricultural effluent discharges specific to the farm including, but not limited to, locations of drains, surface waterways, sub-surface drainage and critical source areas in the agricultural effluent disposal area;
  - (c) identify how the above environmental risks are avoided;
  - (d) describe how each component of the agricultural effluent system is maintained and have regard to the information provided in the pond storage calculations provided in the application;
  - (e) describe how agricultural effluent in storage is managed;
  - (f) describe how agricultural effluent is managed when soils are at or above field capacity and/or during adverse weather conditions; and
  - (g) describe how the stormwater diversion on the system is set up and managed.
23. Annually or more frequently, the Collected Agricultural Effluent Management Plan shall be reviewed and the outcome of the review provided to the Consent Authority within one month.
24. If amended at any time, the most recent version of the Collected Agricultural Effluent Management Plan shall be provided to the Consent Authority within one month of the amendment.

**Advice note:** *The Collected Agricultural Effluent Management Plan required by Condition 22 may be incorporated into the Operational Management Plan required by Land Use Consent AUTH-20211092-05 and/or the Farm Environmental Management Plan required by Rule 20, and prepared in accordance with Appendix N, of the proposed Southland Water and Land Plan (Decisions Version) (or any updated version of the plan).*

**Review of consent**

25. The Consent Authority may, in accordance with Sections 128 and 129 of the Resource Management Act 1991, serve notice on the Consent Holder of its intention to review the conditions of this consent during the period 1 February to 30 September each year, or within two months of any enforcement action being taken by the Consent Authority in relation to the exercise of this consent, for the purposes of:
- (a) determining whether the conditions of this permit are adequate to deal with any adverse effect on the environment, including cumulative effects, which may arise from the exercise of the permit, and which it is appropriate to deal with at a later stage, or which become evident after the date of commencement of the permit;
  - (b) ensuring the conditions of this consent are consistent with any National Environmental Standards Regulations, relevant plans and/or the Environment Southland Regional Policy Statement;
  - (c) amending the monitoring programme to be undertaken;
  - (d) adding or adjusting compliance limits;
  - (e) ensuring the Oreti Freshwater Management Unit meets the freshwater objectives and freshwater quality limits set in an operative regional plan or National Policy Statement for Freshwater Management; and
  - (f) requiring the Consent Holder to adopt the best practicable option to remove or reduce any adverse effect on the environment arising as a result of the exercise of this permit.

for the **Southland Regional Council**

Allan Cubitt  
**Independent Hearing Commissioner**



**Notes:**

1. *The Consent Holder shall pay an annual administration and monitoring charge to the Consent Authority, collected in accordance with Section 36 of the Resource Management Act, 1991, payable in advance on 1 July each year.*
2. *In accordance with Section 125(1)(a) of the Resource Management Act, this consent will lapse after a period of five years after the date of commencement unless it is given effect to or an application is made to extend the lapse period before the consent lapses.*
3. *In accordance with section 126 of the Resource Management Act, 1991, this consent may be cancelled by the Consent Authority if not exercised for a continuous period of 5 years or more.*
4. *The Consent Holder is reminded that they may apply at any time under Section 127 of the Act to have any condition of this consent changed except that which specifies the expiry date of this consent.*
5. *If you require a replacement permit upon the expiry date of this permit, any new application should be lodged at least 6 months prior to the expiry date of this permit. Applying at least 6 months before the expiry date may enable you to continue to exercise this permit until a decision is made, and any appeals are resolved, on the replacement application.*
6. *Dairy shed effluent should not be discharged onto any land area that has been grazed within the previous 5-10 days. Where there has been significant damage to soil during grazing, it is recommended that effluent not be applied until that damage has been repaired.*
7. *Measuring the moisture content of the soil to determine when the soils are at or above field capacity can be done by either actual monitoring on site or by reference to the appropriate Council monitoring site. The Council's soil moisture monitoring sites can be viewed at <http://gis.es.govt.nz/> and following the "Soil Moisture Map" link.*
8. *Ponding is the accumulation of effluent on the soil surface resulting from the application of effluent to saturated soils, or the application of effluent inducing saturated soil conditions.*
9. *Extreme caution should be taken when applying nitrogen fertiliser to the effluent disposal area. It is recommended that a nutrient budget is used to check that nitrogen and potassium application rates to the effluent disposal area are not excessive.*
10. *The Consent Holder should display, in a prominent place in the dairy shed, a copy of the resource consent and relevant limits about the operation of the effluent disposal system that must be complied with.*
11. *Storage systems should be operated at low levels when conditions for effluent disposal are suitable in order to maintain storage for wet weather periods. In particular, storage systems should be emptied in late summer/early autumn to ensure sufficient storage capacity for the following late winter/early spring period.*



### Appendix 1 Discharge Area

#### Discharge Area

-  Discharge Area
-  Farm Boundaries



While every effort has been made to ensure the content is correct, Environment Southland cannot guarantee the accuracy of the data. This information should not be used in any manner without consultation.

DATA SOURCE: ES GIS 2022



Cnr North Road and Price Street  
 (Private Bag 90116  
 DX YX20175)  
 Invercargill

Telephone (03) 211 5115  
 Fax No. (03) 211 5252  
 Southland Freephone No. 0800 76 88 45

## Water Permit

**Under Section 104B** of the Resource Management Act 1991, a resource consent is granted by the Southland Regional Council to **Titipua Limited Partnership** of **354 Hedgehope Block Road, Hedgehope 9872** from **Date Consent Granted 2022**.

**Please read this Consent carefully, and ensure that any staff or contractors carrying out activities under this Consent on your behalf are aware of all the conditions of the Consent.**

### Details of Permit

Purpose for which permit is granted:	To take and use groundwater for the purpose of stock drinking water and dairy shed wash down.
Location	Hedgehope Block Road, Hedgehope
- site locality	E46/1068
- well number	NZTM2000 1257616E 4869560N
- map reference	Makarewa
- groundwater zone	Titipua Stream
- catchment	Lignite Marine Terraces
- Physiographic zone	
Legal description of land at the site:	Lot 3 DP 1494
<b>Expiry date:</b>	<b>31 May 2032</b>

### Schedule of Conditions

- This consent shall not be exercised until Water Permit AUTH-301082-V1 is surrendered or has expired.
- This permit authorises the taking of groundwater at the location specified above. The rate of abstraction shall not exceed:
  - 2 litres per second;
  - 72,000 litres per day; and
  - 26,280,000 litres per year.

**Advice Note**

*The Consent Holder must ensure that the bore that water abstraction occurs from can meet the following conditions:*

1. *The bore or well design and headworks prevent:*
  - (i) *the infiltration of contaminants; and*
  - (ii) *the uncontrolled discharge or leakage of water to the ground surface or between aquifers.*
2. *Should the bore not meet the above conditions, the Consent Holder shall apply to the Consent Authority for a Resource Consent for the use and maintenance of the bore.*
3. Prior to the first exercise of this consent, the Consent Holder shall install a backflow prevention device or take other appropriate measures to ensure water and/or contaminants cannot return to the water source.
4.
  - (a) The Consent Holder shall have and maintain a water meter to record the water take, within an error accuracy range of +/-5% over the meter's nominal flow range. The Consent Holder shall forward a copy of the installation certificate to the Consent Authority within one month of installing the water meter.
  - (b) The water meter shall be installed in a straight length of pipe, before any diversion of water occurs. The straight length of pipe shall be part of the pump outlet plumbing, easily accessible, have no fittings and obstructions in it. There shall be a straight length of pipe on either side of the water meter, on the upstream side there shall be a distance that is 10 times the diameter of the pipe and on the downstream side there shall be a distance of five times the diameter of the pipe.
  - (c) The Consent Holder shall ensure the full operation of the water meter at all times during the exercise of this consent. All malfunctions of the water meter during the exercise of this consent shall be reported to the Consent Authority within five working days of observation and appropriate repairs shall be performed within five working days. Once the malfunction has been remedied, a Water Measuring Device Verification Form completed with photographic evidence must be submitted to the Consent Authority within five working days of the completion of repairs.
  - (d)
    - (i) If a mechanical insert water meter is installed it shall be verified for accuracy each and every year from the first exercise of this consent.
    - (ii) Any electromagnetic or ultrasonic flow meter shall be verified for accuracy every five years from the first exercise of this consent.
    - (iii) Each verification shall be undertaken by a Consent Authority approved operator and a Water Measuring Device Verification Form shall be completed and supplied to the Consent Authority with receipts of service. These shall be supplied within five working days of the verification, and at any time upon request.
  - (e) The Consent Holder shall maintain a record of the total volume of water abstracted each month. The Consent Holder shall provide this record to the Consent Authority by 31 May each year and at any other time on request.

5. Prior to the exercise of this consent, the Consent Holder shall notify the Consent Authority of the person who is in charge of the operation this consent. If the person in charge changes during the term of this consent, the Consent Holder shall notify the Consent Authority of the new operator no later than five working days after that person takes responsibility.
  
6. The Consent Authority may, in accordance with Sections 128 and 129 of the Resource Management Act 1991, serve notice on the Consent Holder of its intention to review the conditions of this consent during the period 1 February to 30 September each year, or within two months of any enforcement action being taken by the Consent Authority in relation to the exercise of this consent, or on receiving monitoring results, for the purposes of:
  - (a) adjusting the consented rate or volume of water under Condition 2, should future changes in water use indicate that the consented rate or volume is not able to be fully utilised;
  - (b) determining whether the conditions of this consent are adequate to deal with any adverse effect on the environment which may arise from the exercise of the consent and which it is appropriate to deal with at a later stage;
  - (c) ensuring the conditions of this consent are consistent with any National Environmental Standards Regulations, National Policy Statement, Water Conservation Order, relevant plans and/or any relevant Regional Policy Statement; or
  - (d) adjusting or altering the method of water take data recording and transmission.

for the **Southland Regional Council**

Allan Cubitt  
**Independent Hearing Commissioner**



**Notes:**

1. *In accordance with Section 125(1)(a) of the Resource Management Act, this consent shall lapse after a period of five years after the date of commencement unless it is given effect to or an application is made to extend the lapse period before the consent lapses.*
2. *Section 126 of the Resource Management Act provides for this resource consent to be cancelled if the consent has been exercised in the past but has not been exercised during the preceding five years.*
3. *If you require a replacement permit upon the expiry date of this permit, any new application should be lodged at least six months prior to the expiry date of this permit. Applying at least six months before the expiry date may enable you to continue to exercise this permit until a decision is made, and any appeals are resolved, on the replacement application.*
4. *The Consent Holder shall pay an administration charge to the Consent Authority collected in accordance with Section 36 of the Resource Management Act, payable in advance on 1 July each year.*

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Cnr North Road and Price Street  
(Private Bag 90116  
DX XY20175)  
Invercargill

Telephone (03) 211 5115  
Fax No. (03) 211 5252  
Southland Freephone No. 0800 76 88 45

## Land Use Consent

Under **Section 104B** of the Resource Management Act 1991, a resource consent is granted by the Southland Regional Council to **Titipua Limited Partnership** of **354 Hedgehope Block Road, Hedgehope 9872** from **Date Consent Granted 2022**.

**Please read this Consent carefully, and ensure that any staff or contractors carrying out activities under this Consent on your behalf are aware of all the conditions of the Consent.**

### Details of Consent

Purpose for which permit is granted: Use of land for a feed pad and herd home winter barn

Location - groundwater zone Makarewa  
- FMU Oreti  
- physiographic zone Lignite Marine Terraces  
- catchment Titipua Stream

Expiry date: **31 May 2032**

### Schedule of Conditions

1. This resource consent authorises the use of land for a feed pad as described in the application for resource consent dated 11 May 2021<sup>1</sup> and the use of land for a herd home winter barn described in the application for resource consent dated 6 December 2021<sup>2</sup>. The activity shall be limited to:
  - (a) the use of land for a feed pad for up to 120 cows between 1 August and 31 October (inclusive);
  - (b) the use of land for a herd home winter barn for up to 490 cows all year round; and
  - (c) the use of the land for a feed pad and herd home winter barn during adverse weather conditions.

<sup>1</sup> Environment Southland Document ID: A654203

<sup>2</sup> Environment Southland Document ID: A723636

2. This consent shall be exercised in conjunction with Discharge Permit AUTH-20211092-01 (or any subsequent variation versions)

3. The feed pad shall be locate as described in the table below:

Legal description	Lot 3 DP 1494
Map Reference of Feed Pad (NZTM 2000)	1257741E 4869400N
Property address	354 Hedgehope Block Road

4. The feed pad shall not be located within:

- (a) 50 metres of any surface watercourse;
- (b) 70 metres of any water abstraction point;
- (c) 200 metres of any place of assembly or dwelling not on the subject property;
- (d) 20 metres of any mapped tile drains; and
- (e) 20 metres from any property boundaries.

5. The feed pad shall be:

- (a) no greater than 1,300 m<sup>2</sup> in area;
- (b) constructed with a concrete tank at the southern boundary to capture effluent generated on the feed pad; and
- (c) constructed with a minimum depth of 500mm of wood-based material across the base and nibbed edges to prevent overland flow beyond the perimeter of the feed pad.

6. Liquid effluent generated on the feed pad shall be captured in the concrete tank and pumped to the effluent system authorised by Discharge Permit AUTH-20211092-01.

7. The herd home winter barn shall be locate as described in the table below:

Legal description	Lot 3 DP 1494
Map Reference of Herd Home (NZTM 2000)	1257658E 4869494N
Property address	354 Hedgehope Block Road

8. The herd home winter barn shall not be located within:

- (a) 50 metres of any surface watercourse;
- (b) 70 metres of any water abstraction point;
- (c) 200 metres of any place of assembly or dwelling not on the subject property;
- (d) 20 metres of any mapped tile drains; and
- (e) 20 metres from any property boundaries.

9. The herd home winter barn shall be:

- (a) no greater than 720 m<sup>2</sup> in area;
- (b) constructed with containment bunkers beneath the herd home to capture effluent generated in the herd home; and
- (c) constructed with a concrete slatted floor and nibbed edges to prevent overland flow beyond the perimeter of the herd home.

10. Liquid and solid effluent generated in the herd home shall be captured in effluent storage bunker authorised by Land Use Consent AUTH-20211092-05.

11. This consent does not authorise the discharge of any liquid effluent or animal and vegetative waste produced as a result of the activity authorised by this consent being undertaken.

**Advice Note:** *The Consent Holder shall discharge:*

- (a) *the feed pad and herd home sludge and associated vegetative matter in accordance with Rule 38 of the Proposed Southland Water and Land Plan (Decisions Version) or any subsequent versions; and*
- (b) *the liquid effluent generated from the feed pad in accordance with the conditions of Discharge Permit AUTH-20211092-01 (or any subsequent variation versions).*
12. The Consent Authority may, in accordance with Sections 128 and 129 of the Resource Management Act 1991, serve notice on the consent holder of its intention to review the conditions of this consent during the period 1 February to 30 September each year, or within two months of any enforcement action being taken by the Consent Authority in relation to the exercise of this consent, or on receiving monitoring results, for the purposes of:
- (a) determining whether the conditions of this permit are adequate to deal with any adverse effect on the environment, including cumulative effects, which may arise from the exercise of the permit, and which it is appropriate to deal with at a later stage, or which become evident after the date of commencement of the permit;
- (b) ensuring the conditions of this consent are consistent with any National Environmental Standards Regulations, relevant plans and/or the Environment Southland Regional Policy Statement; or
- (c) ensuring the Oreti Freshwater Management Unit meets the freshwater objectives and freshwater quality limits set in an operative regional plan pursuant to Policy A1 of the National Policy Statement for Freshwater Management.

for the **Southland Regional Council**

Allan Cubitt  
**Independent Hearing Commissioner**

**Notes**

1. *In accordance with Section 125(1)(a) of the Resource Management Act, this consent shall lapse after a period of five years after the date of commencement unless it is given effect to or an application is made to extend the lapse period before the consent lapses.*
2. *The consent holder shall pay an annual administration and monitoring charge to the Consent Authority, collected in accordance with Section 36 of the Resource Management Act, 1991. This charge may include the costs of inspecting the site up to one time each year (or otherwise as set by the Consent Authority's Annual Plan).*



Cnr North Road and Price Street  
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Invercargill

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## Land Use Consent

Under Section 104B of the Resource Management Act 1991, a resource consent is granted by the Southland Regional Council to **Titipua Limited Partnership** of **354 Hedgehope Block Road, Hedgehope 9872** from **Date Consent Granted 2022**.

Please read this Consent carefully, and ensure that any staff or contractors carrying out activities under this Consent on your behalf are aware of all the conditions of the Consent.

### Details of Consent

Purpose for which permit is granted:	Use of land for farming
Location	- groundwater zone - FMU - physiographic zones - catchment
	Makarewa Oreti Lignite Marine Terraces, Peat Wetlands and Gleyed Titipua Stream
Expiry date:	<b>31 May 2032</b>

### Schedule of Conditions

1. Except as modified by conditions of resource consent, the activities authorised by this resource consent shall be carried out in general accordance with the application for resource consent (APP-20211092)<sup>1</sup> and all subsequent information provided during the application and the Farm Environmental Management Plan required by this consent.
2. For the avoidance of doubt, in the event that any inconsistency between the conditions of resource consent and the information and plans, including the Farm Environmental Management Plan (FEMP), submitted as part of the application, the conditions of resource consent shall prevail.
3. The use of land for farming shall occur on the landholding at 354 Hedgehope Block Road, as shown on the plan attached as Appendix 1, and consisting of a block of land forming the dairy platform, at or about map reference (NZTM 2000) 1257613E 4869560N and comprising Lot 2

<sup>1</sup> Environment Southland Document ID: A654203

DP 420431, Lot 3 DP 1494, Lot 1 DP 470872, Lot 1 DP 386399, Lot 2 DP 386399, Lot 2 DP 558643 and Lot 2 DP 4406.

4. The farming activities shall be limited as follows:
- (a) a maximum milking herd of no more than 600 cows; and
  - (b) intensive winter grazing of a maximum of 400 mature age cows on a maximum of 10 ha of crop.

**Advice note:**

*Intensive winter grazing is defined as the grazing of stock between 1 May and 30 September (inclusive) on forage crops (including brassica, beet and root vegetable crops), excluding pasture and cereal crops.*

5. When intensive winter grazing is occurring on any part of the landholding, the Consent Holder shall:
- (a) maintain a 5 metre buffer at all times between any surface water way (river, artificial watercourse, modified watercourse and natural wetland) and the area being grazed;
  - (b) progressively graze stock from the top to the bottom of any slope, where this is not possible a 20 metre 'last bite' strip shall be left at the bottom of the slope to be grazed last;
  - (c) back fence cattle at all times to prevent the stock re-entering previously grazed areas;
  - (d) provide transportable water trough(s) in or near the areas being grazed;
  - (e) place supplementary feed (including silage, baleage or hay) in portable feeders in the area being grazed;
  - (f) critical source areas (including swales) within the area being grazed, shall be uncultivated and ungrazed; and
  - (g) graze cattle in mobs of no more than 120.
6. The Consent Holder shall notify the Consent Authority the identity of the Person in Charge of the landholding:
- (a) prior to the first exercise of this consent; and
  - (b) no more than five working days following the appointment of any new Person in Charge.

**Advice Note**

*Routine monitoring inspections of this property may occur up to one time each year. This number does not include any other inspections required by other Resource Consents.*

**Exclusions**

7. Cultivation and intensive winter grazing shall not occur on a slope over 10 degrees.

**Nutrient Management**

8. From the first exercise of this Consent, the Consent Holder shall implement a soil testing regime to determine the soil fertility status over the landholding and to develop fertiliser recommendations based on the soil testing results.
9. The Consent Holder shall maintain a record of their soil testing regime, soil testing results and fertiliser recommendations required by condition 9 and provide this record to the Consent Authority ([EScompliance@es.govt.nz](mailto:EScompliance@es.govt.nz)) by 30 September each year.

10. The Consent Holder shall:

- (a) manage the application of fertiliser in accordance with:
  - (i) the Code of Practice for Nutrient Management (With Emphasis of Fertiliser Use) Fertiliser Association, 2013, ISBN 978-0-47328345-2"; or
  - (iii) any subsequent updates;
- (b) not apply fertiliser:
  - (i) to land during the period 1 June - 31 July inclusive;
  - (ii) within 10 m of a surface water body;
  - (iii) within 10 m of any wetland boundary;
  - (iv) within 20 m of any bore;
  - (v) when soil temperature is at or below six degrees Celsius;
  - (vi) when soil moisture capacity is exceeded; and
  - (vii) directly to land within a riparian strip/margin;
- (c) not apply synthetic nitrogen fertiliser at a rate of more than 190 kg/ha/year.

11. The Consent Holder shall:

- (a) take representative soil samples at least once every two years and have those samples analysed for Olsen P by a laboratory with IANZ accreditation;
- (b) by 30 September each year in 2024, 2026, 2028 and 2030 provide the results to the Consent Authority ([EScompliance@es.govt.nz](mailto:EScompliance@es.govt.nz)); and
- (c) if Olsen P levels exceed a range of 29 - 31 the Consent Holder must reduce the amount of P fertiliser being applied to the landholding to ensure the risk of P loss is reduced. This reduction in P fertiliser shall be noted in the records required by condition 26(a).

**Nutrient Modelling**

12. The Consent Holder must ensure that nitrogen and phosphorus losses to water from farming activities undertaken on the land are maintained at, or below the baseline contaminant loss rates of:

- (a) 40 kilograms per hectare per year nitrogen;
  - (i) as estimated by the four-year rolling average loss rates using OVERSEER FM<sup>®</sup> version 6.4.2, undertaken in accordance with the generally accepted best practice modelling including the applicable Best Practice Data Input Standards/Overseer FM User Guide.
- (b) 2.3 kilogram per hectare per year phosphorus;
  - (i) as estimated by the four-year rolling average loss rates using OVERSEERFM<sup>®</sup> version 6.4.0, undertaken in accordance with the generally accepted best practice modelling including the applicable Best Practice Data Input Standards/Overseer FM User Guide; and
  - (ii) information from published New Zealand and Overseas research to estimate the additional phosphorus loss mitigation, beyond that modelled in Overseer, that is likely to occur as a result of the mitigation being implemented in accordance with the FEMP required under this resource consent.

For the purposes of this resource consent, the four-year rolling average is defined as the average of the most recent four consecutive years' results starting from 1 July 2023.

13. Each and every year for the duration of this consent, using the current version of OverseerFM and in accordance with the generally accepted best practice modelling and the current Best Practice Data Input Standards, the Consent Holder shall:
  - (a) model the nitrogen and phosphorus loss rates for the previous year from 1 July to 30 June inclusive;
  - (b) calculate the four-year rolling average of nitrogen and phosphorus loss rates; and
  - (c) re-model the baseline contaminant loss rates specified in condition 12 in the current version of Overseer.
14. The re-modelled baseline contaminant loss rates, modelled in accordance with Condition 13(c) shall supersede and replace the baseline contaminant loss rates specified in condition 12.
15. A report must be provided to the Consent Authority by 30 September each year summarising the results of Overseer nitrogen and phosphorus loss modelling required by condition 13. The report must include:
  - (a) a review of the Overseer input data to ensure that the annual nutrient budget reflects the farming system;
  - (b) an explanation of any differences between that nutrient budget and the annual nutrient budget of all previous years of farming undertaken under this consent;
  - (c) a comparison of the three-year rolling average nitrogen and phosphorus losses with the applicable baseline contaminant loss rates; and
  - (d) the names and summaries of the relevant qualifications and experience of the person(s) who prepared and (if relevant) reviewed the nutrient budget.
16. All nutrient loss modelling required by this consent must be undertaken by a person who is a Certified Nutrient Management Advisor (CNMA) under the Nutrient Management Advisor Certification Programme (NMACP).
17. The Consent Holder may use an alternative model that has been demonstrated to be equivalent to Overseer provided:
  - (a) the evidence to demonstrate equivalence is provided to the Consent Authority at least six months prior to submitting the relevant annual report as required by condition 16; and
  - (b) the use of the alternative model is approved by the Chief Executive of the Consent Authority.

### **Mitigation Measures**

18. Prior to the exercise of this consent, the Consent Holder shall inspect all bridges and culverts and, where necessary, undertake improvements to the structures to ensure that there is no runoff of agricultural effluent to surface water.
19. The Consent Holder shall undertake maintenance of the existing and any new dairy lanes to ensure they are contoured to ensure that any run-off occurs onto vegetated areas where it will not enter any surface water body.
20. Except for crossings of surface waterways, the Consent Holder shall not construct any new dairy lanes within 20 metres of a surface waterbody.



21. The Consent Holder shall:
- (a) construct a new herd home winter barn, as detailed in the application, at or about NZTM 1257658E 4869494N;
  - (b) provide written confirmation of the fully operational herd home winter barn to the Consent Authority ([EScompliance@es.govt.nz](mailto:EScompliance@es.govt.nz)) by 1 May 2023.
22. The Consent Holder shall:
- (a) reconstruct the existing duck pond into a wetland, in accordance with NIWA's *Technical guidelines for constructed wetland treatment of pastoral farm run-off*, as detailed in the application, at or about NZTM2000 1257230E 4869143N by 1 May 2023; and
  - (b) provide written confirmation, along with date stamped photos, of the completed wetland construction to the Consent Authority ([EScompliance@es.govt.nz](mailto:EScompliance@es.govt.nz)) by 1 June 2023.
23. The Consent Holder shall utilise plantain in their re-grassing program. The plantain content shall be recommended by a suitably qualified seed representative and shall be detailed in the FEMP required by condition 28.
24. Following intensive winter grazing on all areas of the landholding, the Consent Holder shall re-sow at the earliest opportunity based on paddock suitable conditions and as soon as practicable to minimise the amount of time that bare ground is exposed.
25. The Consent Holder shall cultivate:
- (a) with the contour of the land being used for cultivation and shall not cultivate up and down the slope; and
  - (b) no less than 5 metres from the outer edge of any surface water body or natural wetland unless for the purpose of renewing or establishing pasture in accordance with Rule 25(b) of the Proposed Southland Water and Land Plan (Decisions Version), or any subsequent replacement versions.

#### **Records and Reporting**

26. The Consent Holder must have and maintain a record of the following practices undertaken on-farm for each year between 1 July and 30 June:
- (a) fertiliser application, including rates and dates of application;
  - (b) types of crops and total area of cropping, including winter feed/forage crops;
  - (c) cultivation methods;
  - (d) stock units with references to type, age and breed;
  - (e) effluent application areas; and
  - (f) all other inputs to the OVERSEER® nutrient budgeting model.
27. These records required by Condition 26 shall be provided to the Consent Authority ([EScompliance@es.govt.nz](mailto:EScompliance@es.govt.nz)) by 30 September each year.

### Farm Environmental Management Plan

28. The Consent Holder shall have and maintain a Farm Environmental Management Plan (FEMP). The FEMP shall, in accordance with Appendix N of (Decisions Version) the Southland Water and Land Plan (or any replacement Appendix in an updated version of the plan), demonstrate how the following outcomes are to be achieved:

- (a) nutrients are used efficiently and nutrient loss to water is minimised;
- (b) contaminant losses from critical source areas are reduced;
- (c) cultivation is undertaken in a manner that minimises the movement of sediment and phosphorus to waterways;
- (d) intensive winter grazing occurs in a way that minimises the loss of sediment, phosphorus and microbiological contaminants to waterways;
- (e) agricultural effluent and other discharges are managed in a way that avoids or minimises the loss of contaminants to water. Irrigation water is applied to meet plant demands and minimises the risk of leaching and run-off;

29. The FEMP required by Condition 28 shall also include, but not be limited to:

- (a) a site map showing the location of critical source areas; physiographic zones; permanent or intermittent rivers, streams, lake, drains, ponds or wetlands; where known the location and depth of any subsurface drainage systems including outlets, riparian vegetation and fences adjacent to waterways and stock access points across waterways;
- (b) details of the implementation and maintenance of mitigation measures required by the conditions of this consent and any mitigations voluntarily implemented including new riparian planting;
- (c) details of the implementation and maintenance of Good Management Practices, including adoption of changing industry good management practices. This includes where the implementation of these is to avoid, remedy or mitigate any farm specific environmental risks to water quality shown through any monitoring undertaken on the property voluntarily or as required by the conditions of this consent;
- (d) a review of the data obtained from the monitoring undertaken in accordance with the Farm Environmental Management Plan and any changes made, or to be made, as a consequence of that monitoring.

**Advice Note:**

*Should the use of a Freshwater Farm Plan be required or available, on the basis that it is certified under section 217G of the Resource Management Act 1991 (as amended from time to time in accordance with Section 217E(2) or (3)) and available for use, the Consent Holder may elect to use such plan.*

30. The FEMP shall be reviewed at least once a year and can be modified at any time by the Consent Holder; and either

- (a) an updated version shall be provided to the Consent Authority by 30 September each year; or
- (b) the Consent Holder must notify the Consent Authority in writing that no changes have been made by 30 September each year.

**Advice Note**

*The results from the review of the FEMP will be assessed by the Consent Authority to ensure that the FEMP will still achieve the objectives specified in the FEMP and the FEMP has been prepared*

*in accordance with Appendix N of the Southland Water and Land Plan (Decisions Version) (or any updated version of the plan).*

31. The Consent Holder shall operate in accordance with the FEMP at all times. Where there is inconsistency between the FEMP and the conditions of the consent, the conditions of this consent shall prevail.

#### **Auditing**

33. The Consent Authority may require the Consent Holder to have the farming activity as authorised by this consent independently audited by a person who is a Certified Nutrient Management Advisor or Farm Environmental Plan Auditor or a Suitably Qualified Person who has demonstrated an equivalent level of expertise.
34. The audit shall assess the performance of the farming activity occurring on the property against:
- (a) the objectives and good management practices specified in the FEMP;
  - (b) any additional mitigation measures implemented on the property either voluntarily or as required by the conditions of this consent; and
  - (c) the baseline contaminant loss rates specified in conditions 12 and 14.
35. The audit must determine the level of confidence of achieving each objective set out in the FEMP. This level of confidence shall be categorised into the following:
- High - the objective is probably being achieved
  - Medium - the objective is possibly being achieved
  - Low - it is unlikely that the objective is being achieved.
36. The audit shall record the justification for each level of confidence assessment, including noting the evidence, or lack of, used to make the determination.
37. Where an objective has received a Medium or Low level of confidence, the audit shall include the actions required for the farm to meet the objective and a timeframe whereby these actions need to be undertaken.
38. Where an objective has received a Medium level of confidence (and the farm has received no Lows), the audit shall also determine whether or not the farm is on-track to achieve the objectives.
39. The audit report shall be provided to the Consent Authority within three months of the date of the Consent Authority issuing a requirement to undertake the audit.
40. The frequency of audit requirements may be annually except where, for two consecutive years, an audit report has concluded that all objectives are probably being achieved (received a high level of confidence). In that situation no further audit will be required for at least three years.
41. Where the audit identifies actions required to be undertaken for the farm to meet the objective the Consent Holder must implement these actions within the timeframes stated in the audit.
42. Upon completion of any changes made and/or mitigations implemented as required by the audit, the Consent Holder shall confirm in writing, including photographs (date and time stamped) to the Consent Authority that these actions have been completed and implemented.

43. Upon completion of all the changes made and/or mitigations implemented as identified in the audit, the Consent Holder must ensure the measures are properly maintained, continue to function and are not removed or altered for the duration of this consent (and any subsequent variation versions).

**Lapse and Review**

44. The Consent Authority may, in accordance with Sections 128 and 129 of the Resource Management Act 1991, serve notice on the consent holder of its intention to review the conditions of this consent during the period 1 February to 30 September each year, or within two months of any enforcement action being taken by the Consent Authority in relation to the exercise of this consent, or on receiving monitoring results, for the purposes of:
- (a) determining whether the conditions of this permit are adequate to deal with any adverse effect on the environment, including cultural effects on the tangata whenua and/or cumulative effects, which may arise from the exercise of the permit, and which it is appropriate to deal with at a later stage, or which become evident after the date of commencement of the permit; or
  - (b) ensuring the conditions of this consent are consistent with any National Environmental Standards Regulations, relevant plans and/or the Environment Southland Regional Policy Statement;
  - (c) amending the auditing/monitoring/recording/reporting/modelling programme to be undertaken;
  - (d) adding or adjusting compliance limits;
  - (e) ensuring the Oreti Freshwater Management Units meets the freshwater objectives and freshwater quality limits set in an operative regional plan or National Policy Statement for Freshwater Management; and
  - (f) requiring the Consent Holder to adopt the best practicable option to remove or reduce any adverse effect on the environment as a result of the exercise of this permit.

for the **Southland Regional Council**

Allan Cubitt  
**Independent Hearing Commissioner**

**Notes:**

1. *Reporting to Council is required by conditions of your consent. The key dates for you to meet are listed below in Table 1:*

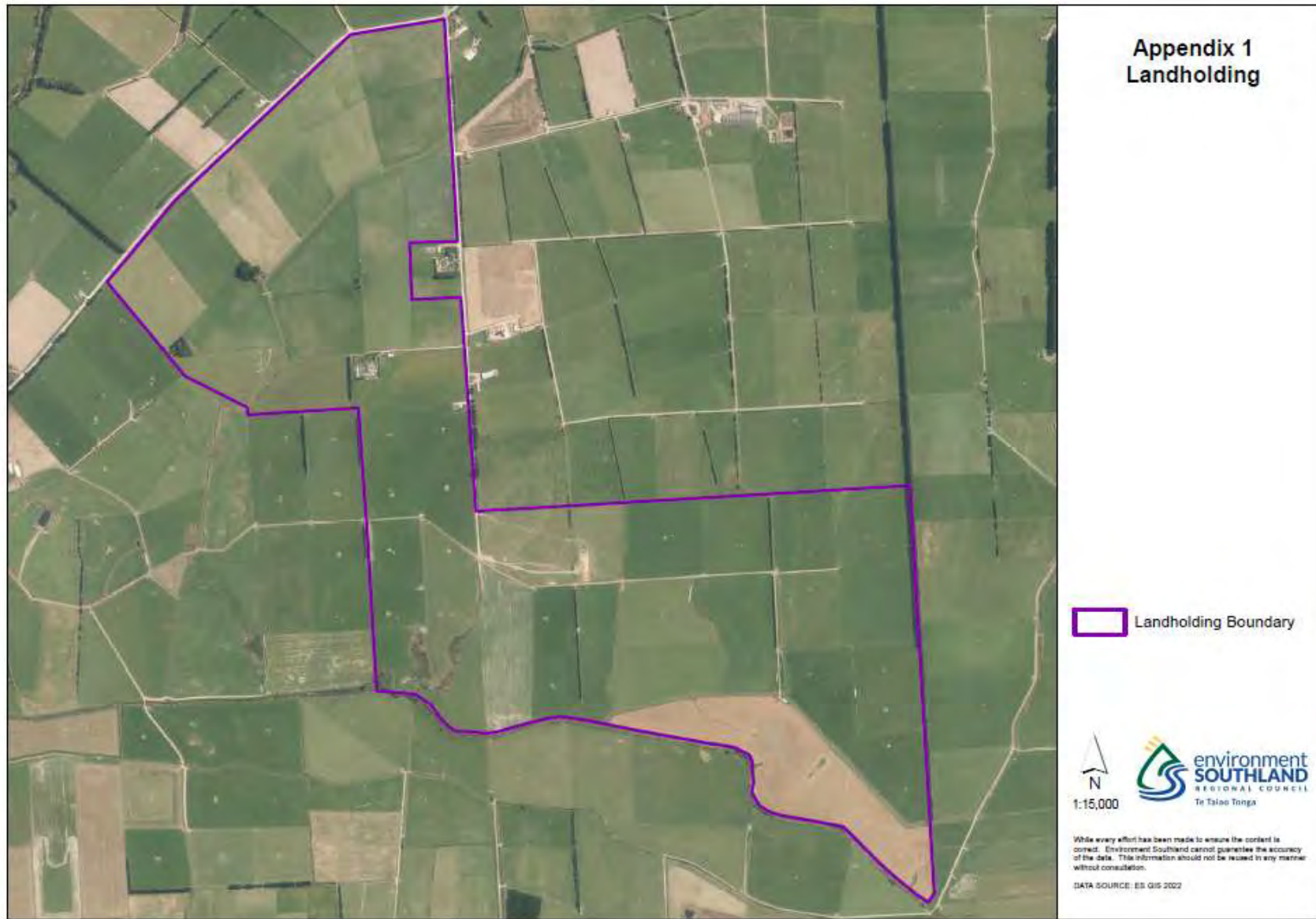
**Table 1: List of Key Dates**

Due date	Condition number	Requirement
30 Sept each year	9	Provide record of soil testing regime, soil testing results and fertiliser recommendations
30 Sept 2024, 2026, 2028 & 2030	11	Provide Olsen P results
30 Sept each year	15	Report summarising results of Overseer modelling
1 May 2023	22	Confirmation of herd home winter barn construction

Due date	Condition number	Requirement
1 June 2023	23	Confirmation of wetland construction
30 Sept each year	27	Provide record of farming practices
30 Sept each year	30	Provide updated version of FEMP if changes were made due to review or confirm no changes were made due to review

2. *In accordance with Section 125(1)(a) of the Resource Management Act, this consent shall lapse after a period of five years after the date of commencement unless it is given effect to or an application is made to extend the lapse period before the consent lapses.*
3. *In accordance with Section 138 of the Resource Management Act, this consent may be surrendered by providing written notice to the Consent Authority. This written notice must be accompanied with evidence to demonstrate that the conversion is complete and that all of the conditions of this permit have been satisfied in full.*
4. *The Consent Holder shall pay an annual administration and monitoring charge to the Consent Authority, collected in accordance with Section 36 of the Resource Management Act, 1991, payable in advance on 1 July each year. This charge may include the costs of inspecting the site up to two times each year (or otherwise as set by the Consent Authority's Annual Plan).*
5. *The FEMP, supporting evidence and on-site practices may be audited by the Consent Authority at any time for compliance and enforcement purposes.*

DRAFT





Cnr North Road and Price Street  
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## Land Use Consent

**Under Section 104B** of the Resource Management Act 1991, a resource consent is granted by the Southland Regional Council to **Titipua Limited Partnership** of **354 Hedgehope Block Road, Hedgehope 9872** from **Date Consent Granted 2022**.

**Please read this Consent carefully, and ensure that any staff or contractors carrying out activities under this Consent on your behalf are aware of all the conditions of the Consent.**

### Details of Permit

Purpose for which permit is granted:	To construct, maintain, and use a herd home bunker for the storage of agricultural effluent
Location	- site locality - map reference - groundwater zone - physiographic zone - catchment
	Hedgehope Block Road NZTM2000 1257658E 4869494N Makarewa Lignite Marine Terraces Titipua Stream
Legal description of land at the site:	Lot 3 DP 1494
<b>Expiry date:</b>	<b>31 May 2032</b>

### Schedule of Conditions

#### General Conditions

1. This consent authorises the construction, maintenance, and use, in accordance with the application for resource consent dated 6 December 2021<sup>1</sup>, of an effluent storage herd home bunker with capacity to store no more than 834 cubic metres of effluent.

#### Operational Requirements and Limitations

2. This Resource Consent shall be exercised in conjunction with Land Use Consent AUTH-20211092-03.

<sup>1</sup> Environment Southland Document ID: A723636

3. There must be no overland or lateral flow, or overtopping or overflowing of agricultural effluent from or outside of, or visible or noticeable leakage from, the structures authorised by this consent, during the use and maintenance of the structures.

#### **Construction**

4.
  - (a) The effluent storage bunker must be designed, and the construction supervised, by a suitably qualified person. The bunker shall be constructed of suitable materials, and shall be designed and constructed in such a manner that it is structurally sound and will not leak.
  - (b) The supervising suitably qualified person shall, upon completion of the construction, provide to the Consent Authority ([escompliance@es.govt.nz](mailto:escompliance@es.govt.nz)):
    - (i) confirmation in writing that the bunker has been designed and constructed in accordance with the conditions of this consent and the "IPENZ Practice Note 21 "Farm Dairy Effluent Ponds" 2017;
    - (ii) the Producer Statement;
    - (iii) results from compaction testing undertaken following completion of the earthworks; and
    - (iv) reports and photographs from each installation progress inspection undertaken by the suitably qualified person, or by any other supervising person acting on their behalf.
  - (c) No effluent may be stored/treated in the bunker until the confirmation required by condition 4(b) is received by the Consent Authority.
  - (d) The confirmation required by condition 4(b) shall be provided to the Consent Authority no later than 1 May 2023.
5. The effluent bunker shall not be constructed within:
  - (a) 50 metres of any surface watercourse;
  - (b) 100 metres of any water abstraction point;
  - (c) 50 metres of any other property boundary;
  - (d) 200 metres of any residential dwelling, other than residential dwellings on the property.

#### **Inspections and monitoring**

6.
  - (a) At least once each milking season, the consent holder shall:
    - (i) inspect the bunker while it is empty to check for cracks, holes, or defects; and
    - (ii) take photographs of the empty bunker which show all aspects of the structure.
  - (b) The consent holder shall maintain a record of the inspections and photographs taken under condition 6(a) and shall provide the record to the Consent Authority upon request.
7.
  - (a) By 30 June 2031 the consent holder shall obtain written confirmation from a Suitably Qualified person that the bunker has no visible cracks, holes or defects that would allow effluent to leak from the structure.



- (b) The certification required by condition 7(a) shall be accompanied by photographs of the structures (date stamped) and be supplied to the Consent Authority within one month of receiving the certification.
8. The Consent Holder shall notify the Consent Authority within 48 hours if the inspections required by condition 6, the certification required by condition 7, or any other inspection or testing identifies that:
- (a) the bunker is not structurally sound (which may be identified through the presence of slumping, hollows, bulges, or defects on either the inside or outside walls of the structure); or
  - (b) the structure has visible cracks, holes or defects that would allow effluent to leak from the structure.
9. Within one week of notifying the Consent Authority under condition 8, the Consent Holder shall advise the Consent Authority in writing of the steps that will be taken to ensure that the structure is made suitable for ongoing use, including:
- (a) any additional testing to be undertaken;
  - (b) an outline of the proposed works to be undertaken to remediate the structure;
  - (c) the timeframe for completion, which shall be no longer than three months;
  - (d) identification of whether the works will require consent for reconstruction of the bunker (rather than the maintenance authorised by this consent);
  - (e) the additional mitigation measures that will be employed to minimise the adverse effects of the leaking structure prior to remediation being undertaken; and
  - (f) testing, certification, or inspections to be completed following the works to demonstrate that the structure is able to comply with the conditions of this consent.

### **Operational Management Plan**

10. Within six months of the exercise of this consent, the consent holder shall prepare and submit to the Consent Authority an Operational Management Plan for the herd home bunker authorised by this consent. The Operational Management Plan may be combined with the Collected Agricultural Effluent Management Plan required by AUTH-20211092-01 (the relevant discharge permit) or any subsequent replacement, and shall include:
- (a) operational procedures relating to the bunker;
  - (b) emergency responses;
  - (c) monitoring and reporting requirements;
  - (d) the undertaking of visual inspections;
  - (e) a record of any maintenance work undertaken; and
  - (f) the installation of monitoring devices.
11. The Operational Management Plan required by condition 10 shall be reviewed at least once each milking season, with the outcome of the review provided to the Consent Authority within one month.

12. If an event (such as effluent overflow to water or collapse of the structure) occurs that may have significant adverse effect on water quality, particularly at the abstraction point of a registered drinking-water supply, the consent holder shall notify, as soon as reasonably practicable, the following:
- (a) the Consent Authority (ph 03 211 5115 or 03 211 5225 after hours);
  - (b) Southland District Council (ph 0800 732 732).

**Accidental Discovery**

13. In the event of a discovery, or suspected discovery, of a site of cultural importance (Waahi Taonga/Tapu) during the effluent bunker construction, the consent holder shall immediately cease operations in that location and inform the local iwi authority (Te Ao Marama Inc, phone 03 931 1242). Operations may recommence at a time as agreed upon in writing with the Consent Authority. The discovery of Koiwi (human skeletal remains) or Taonga or artefact material (e.g. pounamu/greenstone) would indicate a site of cultural importance. Appendix A to this consent outlines the process that is to be followed in the event of such a discovery.

for the **Southland Regional Council**

Allan Cubitt  
**Independent Hearing Commissioner**

**Note:**

1. *The consent holder shall pay an annual administration and monitoring charge to the Consent Authority, payable on invoice. This charge may include the costs of inspecting the operation of this resource consent.*

**Appendix A: Protocol in the event of a discovery, or suspected discovery, of a site of cultural importance (Waahi Taonga/Tapu)**

**1. Kōiwi tangata accidental discovery**

If Kōiwi tangata (human skeletal remains) are discovered, then work shall stop immediately and the New Zealand Police, Heritage New Zealand (details below) and Te Ao Marama Inc. (Ngāi Tahu (Murihiku) Resource Management Consultants) shall be advised. Contact details for Te Ao Marama Inc are as follows:

Te Ao Marama Inc  
Murihiku Marae, 408 Tramway Road, Invercargill  
PO Box 7078, South Invercargill 9844  
Phone: (03) 931 1242

Te Ao Marama Inc. will arrange a site inspection by the appropriate Tangata Whenua and their advisers, including statutory agencies, who will determine how the situation will need to be managed in accordance with tikanga māori.

**2. Archaeological Sites**

Archaeological sites are protected under the Heritage New Zealand Pouhere Taonga Act (2014), and approval is required from Heritage New Zealand before archaeological sites can be modified, damaged or destroyed.

Not all archaeological sites are known or recorded precisely. Where an archaeological site is inadvertently disturbed or discovered, further disturbance must cease until approval to continue is obtained from Heritage New Zealand. As stated above, the New Zealand Police and Te Ao Marama Inc. also need to be advised if the discovery includes kōiwi tangata /human remains.

Heritage New Zealand c/o Regional Archaeologist Otago/Southland  
PO Box 5467, Dunedin  
Phone: (03) 477 9871      Mobile 027 240 8715      infodeepsouth@heritage.org.nz

**3. Taonga or artefact accidental discovery**

If taonga or artefact material (e.g. pounamu/greenstone artefacts) other than kōiwi tangata is discovered, disturbance of the site shall cease immediately and Southland Museum and Te Ao Marama Inc. shall be notified of the discovery by the finder or site archaeologist in accordance with the Protected Objects Act 1975. All taonga tuturu are important for their cultural, historical and technical value and are the property of the Crown until ownership is resolved.

**4. In-situ (natural state) pounamu/greenstone accidental discovery**

Pursuant to the Ngāi Tahu (Pounamu Vesting) Act 1997, all natural state pounamu/greenstone in the Ngāi Tahu tribal area is owned by Te Runanga o Ngāi Tahu. Ngāi Tahu Pounamu Management Plans provide for the following measures:

- any *in-situ* (natural state) pounamu/greenstone accidentally discovered should be reported to Te Runanga o Ngāi Tahu staff as soon as is reasonably practicable. Te Runanga o Ngāi Tahu staff will in turn contact the appropriate Kaitiaki Papatipu Runanga;
- in the event that the finder considers the pounamu is at immediate risk of loss such as erosion, animal damage to the site or theft, the pounamu/greenstone should be carefully covered over and/or relocated to the nearest safe ground.

The find should then be notified immediately to the Programme Leader – Ohanga, at Te Rūnanga o Ngāi Tahu. Their details are as follows:

Te Rūnanga o Ngāi Tahu  
C/- Programme Leader - Ohanga  
Te Whare o Te Wai Pounamu  
15 Show Place, PO Box 13-046, Otautahi/Christchurch 8021  
Phone: (03) 366 4344      Web: [www.ngaitahu.iwi.nz](http://www.ngaitahu.iwi.nz)

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