Application for Resource Consent (PART A)

This application is made under Section 88 of the Resource Management Act 1991

The purpose of this Part A form and the relevant Part B form(s) is to provide applications with guidance on information that is required under the Resource Management Act 1991. Please note that these forms are to act as a guide only, and Environment Southland reserves the right to request additional information.

To: Environment Southland
Private Bag 90116
Invercargill 9840

Full name, address and contact details of applicant *(in whose name consent is to be issued)*

Name: Firdale Farms Ltd

Address: C/- Roger Turk, Julie Clarke and Brendon Clarke

87 Mcmillan Road, No 2 RD, Wyndham 9892

Email: julessthld@hotmail.com

Phone: 0274454719 *Preferred* _____ *Additional* Fax: _____

Consultant contact details *(if different from above)*

Contact name/agent: Landpro Limited

Address: C/- Zen Gerente

PO Box 302, Cromwell 9342

Email: zen@landpro.co.nz

Phone: 0275280683 *Preferred* _____ *Additional* Fax: _____

Please tick the box for the consent(s) you are applying for and complete the relevant Part B form(s) where available:

Land Use

- [ ] Bore/well
- [ ] New or expanded dairy farming
- [ ] Effluent storage
- [ ] Cultivation
- [ ] Tree planting
- [ ] Gravel extraction
- [ ] Hill country burning
- [ ] Riverbed activity (incl. streams/creeks and stopbanks)
- [ ] Bridges and culverts

Discharge

- [ ] To air
- [ ] To water
- [x] To land

Water

- [ ] Take and use surface water
- [x] Take and use groundwater
- [ ] Dam water
- [ ] Divert water

Coastal

- [ ] Whitebait stand
- [ ] Structures/occupation of space
- [ ] Removal of natural materials
- [ ] Disturb foreshore/seabed
- [ ] Discharge/deposit substances
- [ ] Commercial surface water activity
- [ ] Reclaim/drain foreshore/seabed
- [ ] Marine farming
- [ ] Other coastal activities

1 Are there any **current** or **expired** consents relating to this proposal? ☑ Yes ☐ No

If yes, please provide consent number(s) and description:

AUTH-204997 Water Permit
AUTH-204658 Discharge Permit

2 Are any other consents required from Environment Southland or **other authorities**? ☐ Yes ☑ No

If yes, please state the relevant authority and the type of consent(s) required:

3 For what **purpose** is this consent(s) required: (e.g. discharge of effluent, gravel extraction etc.)

to take water from two bores for a dairy operation; to discharge dairy shed, feed pad and wintering barn effluent to land

4 **Location** of proposed activity

Address: 50 Dobbie Road

Menzies Ferry, Edendale

Legal Description: Lot 1 DP 14493, Lot 2 DP 14491, Lot 3 DP 14491, Lot 227 DP 107, Lot 230 DP 107,

Lot 1 DP 14494, Lot 2 DP 500417, Lot 1 DP 13586

Map Reference (NZTM 2000): 1276081 E 4858287 N Discharge Permit

1275982 E 4858088 N Water Permit

5 The name and address of the **owner /occupier:** (if other than the applicant)

Name: Phone:

Address:

6 **Please attach a map or a coloured aerial photograph, showing at a minimum, the location of the proposed activities.**

see attached AEE

7 Assessment of effects on the environment (AEE)

Please complete the applicable Part B form(s) for the proposed activities. For those activities where no Part B form is available, please attach a written statement that assesses the effects that your activities may have on the environment. An assessment of effects **must** include the following information:

(a) If it likely that the activity will result in any significant adverse effect on the environment, a description of any possible alternative locations or methods for undertaking the activity:
(b) An assessment of the actual or potential effect on the environment of the activity:
(c) If the activity includes the use of hazardous substances and installations, an assessment of any risks to the environment that are likely to arise from such use:
(d) If the activity includes the discharge of any contaminant, a description of—
(i) the nature of the discharge and the sensitivity of the receiving environment to adverse effects; and
(ii) any possible alternative methods of discharge, including discharge into any other receiving environment:
(e) A description of the mitigation measures (safeguards and contingency plans where relevant) to be undertaken to help or prevent or reduce the actual or potential effect:
(f) Identification of the persons affected by the activity, any consultation undertaken, and any response to the views of any persons consulted:
(g) If the scale and significance of the activity's effects are such that monitoring is required, a description of how and by whom the effects will be monitored if the activity is approved:
(h) If the activity will, or is likely to, have adverse effects that are more than minor on the exercise of a protected customary right, a description of possible alternative locations or methods for the exercise of the activity (unless written approval for the activity is given by the protected customary rights group).

You should also include:

(a) An assessment of the activity against any relevant provisions of any relevant objectives, policies, or rules:
(b) Any information specified to be included in the application in accordance with the relevant regional plan:
(c) For an application to replace an existing consent, an assessment of the value of the investment of the existing consent holder:

An assessment of effects **must** address the following matters:

(a) any effect on those in the neighbourhood and, where relevant, the wider community, including any social, economic, or cultural effects:
(b) any physical effect on the locality, including any landscape and visual effects:
(c) any effect on ecosystems, including effects on plants or animals and any physical disturbance of habitats in the vicinity:
(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:
(e) any discharge of contaminants into the environment, including any unreasonable emission of noise, and options for the treatment and disposal of contaminants:
(f) any risk to the neighbourhood, the wider community, or the environment through natural hazards or the use of hazardous substances or hazardous installations.

8 Affected Parties

Please attach written approval from parties who may be affected by your activity. *Written Approval of an Affected Party* forms are available on the Environment Southland website. During the processing of your application, Council may determine that additional approvals are required.

Checklist: Have you included the following?

to be paid within 3 days	Payment of the required deposit *(see attached fee schedule)*
n/a	Written approval from all potentially affected parties *(forms available from the Environment Southland website)*
✔	Site plan/location map/sketch of the proposed activity
✔	A copy of the Certificate of Incorporation (*where applicant is a company*)
✔	Part B form(s) specific to your activity and/or a separate assessment of environmental effects (AEE)

Notes:

(a) If your application does not contain the necessary information and the appropriate fee, Environment Southland must return the application.

(b) Council cannot accept electronic lodgement of applications at this time.

Signature of applicant

I hereby certify that to the best of my knowledge and belief, the information given in this application is true and correct.

I undertake to pay all actual and reasonable application processing costs incurred by Environment Southland.

Name (block capitals) ZEN GERENTE

Signed  **Date** 11 October 2017

(*Signature of applicant or person authorised to sign on behalf of applicant)*

Fee Schedule

The Council's user charges are fixed under Section 36 of the Resource Management Act 1991. Refunds may be given, or additional fees are charged, where appropriate.

Deposits	
Bores and wells Whitebait stands Transfer of a consent from one person to another Administrative variation	**$100**
Certificate of Compliance	**$500**
Transfer an activity from one site to another Any other change/variation to an existing consent	**$1,350**
All other non-notified applications	**$1,350**
Concurrent non-notified consent applications	**$150**
Applications that require notification or limited notification	**$2,000**

Note: The fees shown in Table 1 are deposits to be paid at the time of application. Due to the complexity of these activities, this deposit will not usually cover the full cost of processing the application. Further costs may be incurred relating to staff time, disbursements, legal charges, consultation fees, and hearing commissioner fees.

Concurrent – means for additional permits in respect of the same site, activity, applicant, time of application, and closely related effect as the first application.

Environment Southland accepts payment in the forms of cash, Eftpos, cheque, or electronic transfer. All electronic transfers must include the applicant's name and "consent application" as a reference. Please make electronic payments to: Environment Southland, 01-0961-0018998-00.

User Charges: Please note that additional annual Users Charges will apply to all consents. These are payable in advance on the first day of July each year. Schedules 3 and 4 of the Environment Southland User Charges and Fees document outline the fees associated with Annual Administration Charges and Annual Consent Monitoring and Inspection Charges. Schedule 6 Annual Research and Monitoring Charges apply only to surface and groundwater takes and comprise the following:

- **Surface water takes:** A charge of **$1.72** per year per cubic metre authorised as a maximum daily take. Minimum of **$138**, maximum of **$6,895**, per consent.
- **Groundwater takes:** A charge of **$0.81** per year per cubic metre authorised as a maximum daily take. Minimum of **$162**, maximum of **$1,620**, per consent

Municipal and stock water charges are reduced by 50%.

Environment Southland's User Charges and Fees document is available at: www.es.govt.nz/resource-consent/fees

Resource Consent Application for the Discharge of Agricultural Effluent (Part B)

This application is made under Section 88 of the Resource Management Act 1991

A complete Part A form needs to be provided with this Part B form. The purpose of this Part B form is to provide applicants with guidance on information that is required under the Resource Management Act 1991. These forms are to act as a guide only and Environment Southland reserves the right to request additional information.

Section A: Application details

1. Please provide details of your existing resource consent to discharge agricultural effluent:

(a) Consent number: AUTH-204658

(b) Expiry date: 29 January 2018

2. What is the maximum number of animals from which you propose to collect effluent from under this resource consent application?

700 animals

Note: if you wish to increase the size of your milking herd, this form is not suitable for your use. Please contact Environment Southland staff for more information.

Section B: Location of discharge and description of surrounding environment

3. Location of the proposed discharge:

Address: 50 Dobbie Road, Menzies Ferry, Edendale

Map reference: 1276081 E 4858287 N

Legal description: Lot 1 DP 14493, Lot 2 DP 14491, Lot 3 DP 14491, Lot 227 DP 107, Lot 230 DP 107, Lot 1 DP 14494, Lot 2 DP 500417, Lot 1 DP 13586

4. Please complete the following tables which tell us about your property and effluent disposal area. Information can be found on the Environment Southland Website in the Beacon application, or by contacting Environment Southland.

Property Details:-	
Total Farm Area (ha)	236.5
Effective Farm Area (ha)	234
Size of effluent disposal area (ha)	210
Stocking rate	2.99 cows per ha
Freshwater Management Unit	Mataura

Effluent Disposal Area Details				
Soils	**Soil Type**	**Vulnerability Factors**		
		Structural Compaction	**Nutrient leaching**	**Waterlogging**
	Edendale	Slight	Moderate	Slight

FDE land classification	Category A – Artificial Drainage or coarse soil structure	
	Category B – Impeded drainage or low infiltration	
	Category C – Sloping land (over 7 degrees)	
	Category D – Well drained flat land	✔
	Category E – Other well drained but very stony flat land	

Physiographic zone (s)	**Zone**	**Contaminant pathway(s) for Physiographic zone**
	Oxidising	Deep drainage (Main); Artificial drainage; Overland Flow

5. Are there are any permanent or intermittent rivers, streams, lakes, drains, ponds or wetlands within 20 metres of the discharge area?

Yes		(Go to question 6)
No	✔	(Go to question 7)

6. Features of the rivers, streams, lakes, drains, ponds or wetlands within 20 metres from the discharge area include:

		Yes	**No**
(a)	signs of instream life (e.g. fish, eels, bullies, crayfish, native birds, frogs)		
(b)	areas where food is gathered from a water body (e.g. watercress, eels, wildfowl)		
(c)	bird nesting habitats		
(d)	areas of particular aesthetic, cultural, heritage or scientific value (e.g. archaeological sites)		

7. Are there are any bores or soakholes within 20 metres of the discharge area?

Yes	
No	✔

8. How many metres is the discharge area from any:

		Metres from discharge area
(a)	feature	n/a
(b)	surface waterbodies	approximately 900 m
(c)	artificial watercourses	n/a
(d)	subsurface drains	n/a
(e)	the coastal marine area	n/a
(f)	residential dwellings and places of assembly	>200 m
(g)	landholding boundaries	>20 m
(h)	water abstraction points	>100 m
(i)	registered drinking water supplies	approximately 3.5 km

10. Please attach a scaled farm plan or a coloured aerial photograph, showing:

- farm boundaries;
- paddock boundaries;
- effluent disposal paddocks (numbered and size in hectares);
- irrigation system layout;
- tile drains/mole drains;
- streams, rivers, farm drains, springs and wetlands;
- bores within 100 m of the disposal area;
- any known water abstraction points within 100 m of the disposal area;
- buildings (houses, sheds, wintering pads) and/or other places of assembly;
- effluent storage pond(s) and any effluent treatment infrastructure;
- cow races;
- dairy shed location;
- any other discharge areas (such as whey);
- any areas prone to flooding;
- any swampy areas (i.e. where water builds up in the sediments close to the ground surface above layers of poorly draining soils) within the discharge area.

see attached AEE

Section C: Description of proposed activity

11. Dairy shed effluent

(a) How many cows will be milked each day? 700

(b) How many times per day will you milk (maximum)? once/(twice)/three times per day

(c) What is the length of the milking season? (please include dates) 291 days

8 August - 25 May (dates)

(d) What is the volume of wash down effluent generated per day? 20,000 (litres/day)

12. Winter milking

(a) Does your milking season include winter milking? No

(b) If yes, what is the number of cows to be milked in winter? _____ cows

(c) How many times per day will you milk _____ once/twice/three times per day

(d) Dates of winter milking season _____ (provide dates)

13. Feed pad/wintering pad/stand-off pads

(a) Number of cows on feed/wintering/stand-off pad 2 pads 350 each = 700 total cows

(b) What is the size of the area? 1750 and 3187 square metres

(c) Is the feed/wintering/stand-off pad roofed? Old feed pad = No; wintering pad Yes Yes/No

(d) Is rainwater diversion in place? Old = No; Wintering pad = Yes Yes/No

(e) Is it mechanically swept? Yes Yes/No

(f) If it is washed down, amount of water used n/a litres/day

(g) How is effluent from this facility disposed of? n/a

(h) Intended length of time the area is to be used about 130 days per year

14. Please describe any other sources of effluent that is collected for discharge e.g. stock underpasses and silage pads

15. **Total volume of effluent:**

Using your answers to questions 11-14 (above) what is the total volume of effluent to be discharged (in cubic metres/day)?

20 cubic metres per day from dairy shed

Effluent irrigation rate and method

16. **Please describe how effluent will be collected, treated and discharged to land and when it will be discharged to land:**

the effluent goes to storage pond and discharge to land through low rate irrigation during suitable conditions

See attached AEE for details

Proposed instantaneous effluent application rate* 10 mm/hr

Proposed effluent application depth 25 mm per application

*This is the depth of effluent that would be applied to a soil surface if the irrigation system was run continuously for one hour.

17. **Has the effluent irrigator discharge rate been checked and calibrated recently? This is particularly recommended for high rate irrigators.**

- [x] No
- [ ] Yes

If yes, then please include the results of the test.

Section D: Storage facility

18. What volume of effluent storage and treatment do you have on site (m^3)?
Please include a Massey Effluent Pond Calculation to show that you have, or will have sufficient effluent storage.

Effluent Pond/Tank	2943	Cubic metres
Sump(s)		Cubic metres
Weeping wall/sludge bed		Cubic metres
Other (please specify)		Cubic metres

19. Are you increasing storage on site?

Yes	☐	(Go to question 20)
No	✔	(Go to question 21)

If you are increasing your storage then please complete the land use consent application form for effluent storage.

20. By how much and to what volume?

n/a Cubic metres

21. When was your effluent storage and treatment installed?

2008

22. Has your current effluent storage pond, tank or structure been certified by a Chartered Professional Engineer as being structurally sound?

No	☐

23. Have you undertaken an Effluent Pond Drop Test that has been certified by a Chartered Professional Engineer?
(Refer to Appendix P of the proposed Southland Water and Land Plan for the Effluent Pond Drop Test methodology (shown at the back of this form))

Yes	✔
No	☐

If you have certification from a Chartered Professional Engineer, please attach the certification to your consent application

24. Pond level drop

Information in this section will be known if you have had a drop test performed on your existing pond. Please contact the Consent Authority for advice as to whether or not you need to perform this test on your storage.

(a) What is the pond level drop for your storage facility? 1.3 (mm per 24 hours)

(b) What is the maximum depth of your pond (excluding freeboard 2.7 (metres)

(c) Does your pond level drop exceed the maximum allowable pond level drop (see table below)?

- [x] No
- [ ] Yes

Maximum Depth of Pond (m) excluding freeboard	Maximum Allowable Pond Level Drop (mm per 24 hours)
<0.5	1.2
0.5 to 1.0	1.4
1.0 to 1.5	1.6
1.5 to 2.0	1.8
>2.0	2.0

Section E: Assessment of Effects

25. Please describe any possible long term or short term effects the discharge may have on the quality of the receiving environment and including effects on water bodies, biota (plant and animal life), soil quality, and human health:

see attached AEE

Section F: Good Management Practices and Mitigation Measures

Please include a description of the monitoring or good management practices to be undertaken to help avoid, reduce, remedy or mitigate the actual or potential effects on environmental features and values.

26. Are there any times when you will avoid disposing the effluent to land?

Yes ☑ No ☐

If **yes**, please indicate below the times you will avoid effluent disposal

(a) When there is snow on the ground ✔

(b) Areas where food is gathered from watercourses (e.g. watercress, eels, wildfowl)? n/a

(c) When rainwater or irrigation water has ponded on the land surface ✔

(d) When the soil temperature is at or below 5 degrees Celsius ✔

(e) When the soil moisture conditions as per Council's monitoring site, or my own soil moisture site say it is unsuitable ✔

(f) Other (please state)

To minimise the risk of adverse effects from odour and spray drift, it is recommended that effluent shall not be discharged within 20 metres of the property boundary or 200 metres of any residential dwelling other than those on the subject property. If you cannot adhere to this buffers, then please describe what effects there may be beyond the property boundary resulting from odour and/or spray drift.

27. What contingency plans do you have in place in the event you are unable to discharge the effluent to land, including during bad weather conditions or if any equipment breaks down:

Examples: The capacity of my storage facility is sufficient to defer irrigation in unfavourable weather conditions; or I plan to have the effluent taken off my property.

The storage pond volume is sufficient to defer irrigation in unfavourable weather conditions.
There is a tractor pump which can be used as a back-up pump.
There is a contractor with slurry spreaders which may be used if there usual method of effluent discharge is not possible during breakdown or maintenance.

28. **What good management practices will you use to avoid or mitigate the effects and the risks of your discharge to the environment? For example: low rate effluent discharge.** *These can be found on the Environment Southland website, including on the relevant Physiographic zone information sheets.*

see attached AEE

My maintenance for my effluent system includes:

maintenance undertaken as required

The checks I will undertake on my effluent storage and treatment and disposal system to ensure it is not leaking or is not broken are:

weekly visual check and regular equipment maintenance checks

I monitor my effluent discharge by:

weather and environment check before discharge

visual inspection each time effluent is discharged

Section F: Other matters

29. Please specify the duration sought for the resource consent:

10 years

Please say why you think this consent duration is appropriate for your operation:

see attached AEE (Section 8)

30. Do you have a current collected agricultural effluent management plan?

Yes ✔ No ☐ FAFP will be refined and reviewed periodically and as needed.

This plan can be part of the plan that you have prepared for your farm to meet the requirements of Appendix N of the proposed Plan. If you do have a plan which sets out how you manage your effluent then please include it in this application.

31. Have you identified any parties which may be affected by the activity?

Yes ☐ No ✔

If **yes**, please indicate below

(a) Neighbours

(b) Other consent holders in the immediate area

(c) Department of Conservation

(d) Iwi (Te Ao Marama Inc; Te Rūnanga O Ngāi Tahu

(e) Local authorities

(f) Fish & Game New Zealand

(g) Other (please state)

Please include evidence of any consultation undertaken for this application.

Section G: Planning Assessment and Declaration

The Resource Management Act 1991 requires you to make your own assessment of your proposal against relevant policies. A separate planning assessment sheet is available to use, or you can do your own assessment. The planning assessment can be found on our website, under the application forms. An assessment must be included with your application.

I hereby certify that to the best of my knowledge and belief, the information given in this application is true and correct.

I undertake to pay all actual and reasonable application processing costs incurred by Environment Southland.

Name (please print) Zen Gerente

Signed 

Date 11 October 2017

END OF FORM

Appendix P: Effluent Pond Drop Test methodology

- Testing is undertaken over a minimum period of 48 hours.
- Testing recording equipment is to be accurate to not more than 0.8 mm.
- Continuous readings are to be taken over the entire test period at not more than 10 second intervals.
- Data analysis is undertaken by a party independent of equipment installer.
- Any change in pond fluid level over the test period needs to be accounted for.
- Ponds must be at or over 75% design depth before a test can be undertaken.
- The pond has been de-sludged in the 12 months prior to the test being undertaken and there shall be no sludge or crust on the pond surface during the test.
- The pond surface is not frozen during any part of the testing.
- An anemometer shall be installed for the duration of the test and at no time shall the wind speed exceed 10 metres per second during the test.

Firdale Farms Ltd

Policy Sheet for Farm Dairy Effluent Applications

Please read these carefully and tick where you agree with the statements. These policies are available in full on Environment Southland's website.

environment SOUTHLAND REGIONAL COUNCIL
Te Taiao Tonga

Assessment against Part 2 of the RMA

Relevant Provisions		Agree?
Part 2	The application achieves the purpose of the RMA through sustainable management of natural and physical resources.	✔

Assessment against the National Policy Statement for Freshwater Management (NPS FM), 2014

Relevant provisions		Agree?
Objective A1 – Sustainable management, use and development of land	Given that the effects associated with the discharge of effluent are anticipated to be less than minor, the consent application is consistent with Objective A1.	✔
Objective A2 – maintain or improve water quality	My proposed mitigation measures show that the proposed discharge of dairy effluent will assist in maintaining or improving water quality.	✔

Assessment against the Regional Policy Statement for Southland (RPS), 1997

Relevant provisions		Agree?
Objective 5.2 – water quality is maintained or enhanced	My proposed mitigation measures will that in the discharge of contaminants, water quality will be maintained.	✔

Assessment against the Proposed Southland Regional Policy Statement (Proposed RPS), 2012

Relevant provisions		Agree?
Objective WQUAL 1 and Policy WQUAL 1 – water quality goals and management.	My proposed mitigation measures will ensure that the discharge of effluent is appropriately managed in order to maintain water quality.	✔
Objectives BIO2 and BIO3 and Policies BIO2 and BIO7 – protection of significant areas, Tangata Whenua and integrated management	My proposed mitigation measures will ensure the discharge of effluent is appropriately managed.	✔

Assessment against the Proposed Southland Water and Land Plan (SWAL Plan), 2016

Relevant provisions	Assessment	Agree?
Objective 6 – land use and water quality	My mitigation measures show an understanding of the connection between land use and freshwater and seek to manage any effects on water quality. These will ensure that water quality is maintained.	✔
Objective 8 - water quality of aquifers	The proposed mitigation measures will ensure that the discharge will not adversely affect existing water quality of groundwater or hydraulically connected waterways.	✔
Objective 13 – use and development of soils and water quality	The proposed mitigation measures will ensure the discharge of effluent to land will not have a significant or cumulative effect on human health and these are avoided and adverse effects on the environment are avoided, remedied or mitigated.	✔

Relevant provisions	Assessment	Agree?
Objective 18 – Good practice	I will operate at good practice or better to optimise efficient resource use and to protect land, soils, and water from quality and quantity degradation.	✔
Policies 1, 2 and 3	I have considered Iwi Management Plan and I will not adversely affect Taonga species.	✔
Policy 13- Land use and water quality	The proposed mitigation measures will ensure the discharge activities are appropriately managed.	✔
Policy 15 – Maintaining and improving water quality	The proposed mitigation measures will ensure any adverse effects on water quality are avoided, remedied or mitigated.	✔
Policy 16 – farming activities that affect water quality	I will minimise the environmental effects from my farming activities by having management plans and managing sediment, runoff and nutrient losses.	✔
Physiographic zone policies (Policies 4-12)	**Please read the fact sheet for your zones before agreeing with the below statement:** I will avoid, remedy, or mitigate erosion and adverse effects on water quality from contaminants transported by various drainage pathways by implementing GMP's. These GMP's are included in my consent application.	✔

Assessment against the Operative Regional Water and Land Plan (2010)

Relevant provisions	Assessment	Agree?
Policies 6 and 25 – effects on water quality and soil health	My management practices and GMP's will help me to avoid, remedy or mitigate effects on water quality and soil.	✔
Policies 7 and 13 – discharges to land	My discharge is to land and not to water.	✔
Policies 31A, 31C and 31D – land and soil health	My discharge is to land; the management of my discharge means that I mitigate any adverse effects and the level of management of my discharge is in line with the level of risk to the environment.	✔
Policy 42 – effluent discharges	I have avoided adverse effects as a result of my discharge by matching the level of management of my discharge to the level of risk.	✔

Assessment against the Regional Effluent Land Application Plan

Relevant provisions	Assessment	Agree?
Objective 4.1.1 and Policies 4.2.1 and 4.2.2 – soil health	My discharge is to land, will be done in a sustainable manner and will be managed to safeguard the life supporting capacity of soil.	✔
Objective 4.1.2 and Policy 4.2.3 – safeguarding water quality and mitigate adverse effects	My discharge will be managed in a way to avoid or mitigate effects on water quality and to safeguard the life supporting capacity of water.	✔
Objective 4.1.14 and Policy 4.2.9 – amenity values	I will not adversely effect amenity values as a result of my discharge	✔
Policies 4.2.4 and 4.2.7– precautionary approach and good practice	I have taken a precautionary approach and there is little uncertainty about the effects of my activity. I will operate at good practice, or above.	✔

Application for a Water Permit (PART B) - To Take and Use Groundwater

This application is made under Section 88 of the Resource Management Act 1991

A complete Part A form needs to be provided with this Part B form. The purpose of this Part B form is to provide applicants with guidance on information that is required under the Resource Management Act 1991. These forms are to act as a guide only and Environment Southland reserves the right to request additional information. **Please also refer to Appendix A of the Regional Water Plan for Southland, 2010.**

User Charges: Please note that annual User Charges will apply to all water permits. Schedule 6 of Environment Southland's User Charges and Fees document outlines the Annual Research and Monitoring Charges, which you should consider before applying for a water permit. Please refer to www.es.govt.nz/resource-consent/fees for more information on annual user fees and charges.

To: Environment Southland
Private Bag 90116
Invercargill 9840

1 What is this application for?

☐ a new groundwater take ☑ the renewal of existing consent no: 204997

2 What duration of resource consent is sought? 10 years

3 For what purpose(s) will the water be used?

☑ Stock water and/or dairy shed use ☐ Irrigation ☐ Community supply ☐ Commercial/industrial

☐ Other

If other, please describe: _____

4 Please provide details of the bore(s) from which you wish to take water. *If you do not have an existing bore, you will need to apply for a consent to construct a bore before you apply to take groundwater. Please refer to the relevant Part B form.*

Bore 1: NZTM 2000 1275982 E 4858082 N Bore number: F46/0727

Bore 2: NZTM 2000 _____ E _____ N Bore number: _____

	Bore depth (m)	Screen depth (m)	Diameter (mm)	Pump type	Pump capacity (l/s)
Bore 1	25	22	200		9
Bore 2					

5 How much water do you propose to take and at what rate will it be taken?

Maximum rate of take		litres per second
Maximum daily volume	71.88	cubic metres per day
Maximum weekly volume		cubic metres per week
Maximum monthly volume		cubic metres per month
Maximum annual volume		cubic metres per year

6 What is the frequency of the proposed water take?

How many hours per day (maximum)?	24
How many days per week (maximum)?	7
How days per month (maximum)?	31

7 Please state the name of the aquifer that you propose to take water from.

Edendale Groundwater Zone

8 Do you intend to store your water before subsequent use?

If yes, what/how much storage will be provided? _____ m^3

What type of storage facilities are proposed? 4 storage tanks (existing)

You may need a building permit and/or additional resource consents for the construction of storage facilities.

9 What type of water metering system is installed or proposed to be installed? Environment Southland prefers all takes for 5 l/s or more to be fitted with telemetry to report in line with the Resource Management (Measurement and Reporting of Water Takes) Regulations 2010.

- [x] Water meter
- [ ] Data logger
- [ ] Telemetry

10 If you propose to use water for stock and/or dairy shed use – please answer the following:

(a) What type of animal and numbers of stock will be supplied with water for drinking?

☐	Sheep	Number:		Water required:		litres/head/day
☐	Beef cattle	Number:		Water required:		litres/head/day
☑	Dairy cows	Number:	700	Water required:	102.69	litres/head/day
☐	Other	Number:		Water required:		litres/head/day

(b) How much water do you require for your dairy shed? 32.69 litres/head/day

11 If you propose to use water to irrigate land – please answer the following:

(a) How many hectares of land will be irrigated? _____

(b) What is the soil type(s) of the land being irrigated _____

(c) What will you be irrigating (i.e. crop, pasture etc)? _____

(d) What type of irrigation system will be used? _____

(e) What is the target application rate (mm/day and mm/year)? _____

(f) How have you calculated the amount of water you need? (attach separate pages if required)

_____

12 If you propose to use water for industrial use – please answer the following:

(a) What type of industry will be using the water and how will the water be used?

_____

(b) How have you calculated the amount of water you need? (attach separate pages if required)

_____

13 If you propose to use water for commercial/domestic supply – please answer the following:

(a) What type of establishment will use the water?

	Households – number of households to be supplied: _____
	Camping grounds – maximum number of visitors and staff per year: _____
	Schools – maximum number of students and staff per year: _____
	Motel units – number and expected occupancy: _____
	Other: _____

(b) How have you calculated the amount of water you need? (attach separate pages if required)

_____

14 If you propose to use water for any other purpose, please describe the amount of water you will need and how this has been calculated (please attach a separate sheet to this application, if necessary).

70 L/cow drinking water

32.69 L/cow dairy shed etc
102.69 L/cow per day * 700 cows = 71,883 L/day ~71,880 L/day

15 Please describe any other sources of water available for the property. Describe how much water is available and what it is used for.

n/a

16 **Please also describe any measures you are proposing to minimise wastage of water and maximise its efficient use:**

no wash down water used in feed pad and wintering pad
use of water storage tanks

17 **Does your proposed water take have any associated discharges? If yes, please describe.**

☑ Yes ☐ No

Please note that a discharge into the environment may require a resource consent application to be made specifically for the discharge (please refer to the relevant Part B form).

discharge of effluent from water use; discharge permit is being sought

Existing Environment

18 **Are any of the following features found within the existing environment of the proposed activity? Describe these features in the space below, along with details of the assessment undertaken to determine the presence of these features.**

	Yes	No
(a) Signs of instream life (e.g. fish, eels, bullies, crayfish, native birds, frogs)?		✔
(b) Areas where food is gathered from a water body (e.g. watercress, eels, wildfowl)?		✔
(c) Wetlands, wildlife habitats or bird nesting habitats (e.g. swamp areas)?		✔
(d) Other activities occurring in the area (e.g. commercial activity, fishing, swimming, boating)?		✔
(e) Areas of particular aesthetic, cultural, heritage or scientific value (e.g. archaeological sites)?		✔
(f) Waste discharges and/or monitoring sites?	✔	
(g) Other water takes?	✔	
(h) Surface water bodies? Natural springs?	✔	

The property is also part of the effluent disposal area.

There are wells in the surrounding farms.

Nearest water body is outside the farm.

See attached AEE

Please also include a map or aerial photograph showing the following:

- the location(s) of the existing points of take;
- the location of proposed points of take(s);
- the location of water measuring device(s);
- the total property area boundary;
- the area(s) to be irrigated (if relevant);
- the area(s) of community supply (if relevant);
- distances to any discharge activities;
- other surface water bodies and wetlands nearby and the distance from the point of take(s) to them;
- the coastline and the distance to it (if relevant);
- the location of any dairy sheds (if relevant).

see attached AEE

Assessment of Effects See Attached AEE

19 Will the take and use of groundwater have any effects on the following:

	Yes	No
(a) Aquifer storage volumes		
(b) Existing bore or well yields		
(c) River and stream flows, including minimum flows and allocation levels		
(d) Wetland and lake water levels		
(e) Groundwater quality		

*For those answered **No** above, please describe why there will be no effects. For those answered **Yes**, please describe how these effects may occur.*

20 **Pursuant to Schedule 4 of the Resource Management Act, 1991, there are a number of matters that must be addressed by an assessment of environmental effects. Please discuss what effects the proposed activity will have on the following:** see attached AEE for details

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

see attached AEE

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

nothing more than minor compared to existing

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

nothing more than minor compared to existing

(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

nothing more than minor compared to existing

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

addressed in the AEE

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

not applicable

21 **Please include a description of the monitoring or mitigation measures (including safeguards and contingency plans where relevant) to be undertaken to help avoid, reduce, remedy or mitigate the actual or potential effects on environmental features and values.**

water meter will be used

22 **Please include a description of any possible alternative locations or methods for undertaking the activity and why these alternatives have not been selected.**

The well is existing and still provides adequate supply so no alternatives have been considered.

23 **Please include evidence of any consultation undertaken for this application. This may include (but not be limited to) consultation with adjoining landowners, other consent holders in the immediate area, iwi (e.g. Te Rūnanga O Ngāi Tahu, Te Ao Marama Inc.), government departments/ministries (e.g. DOC), territorial authorities and recreational associations.**

24 **Appendix A of the Regional Water Plan for Southland, 2010, details the level of further assessment required as part of your application. This may include the following assessments (please attach as a separate report):**

- interference effects/drawdown;
- radius of influence;
- stream depletion effects;
- an assessment of the dynamic aquifer response to abstraction.

25 **Appendix L of the proposed Southland Water and Land Plan, 2016, details the level of further assessment required as part of your application. This may include the following assessments (please attach as a separate report):**

- aquifer test requirements;
- stream depletion effects;
- interference effects;
- calculation of seasonal groundwater allocation;
- establishing allocation volumes for confined aquifers.

Please note that in accordance with Schedule 4 of the RMA, you may also be required to provide an assessment of whether or not the proposed activity is contrary to any of the relevant provisions of the following documents.

(a) Regional Policy Statement for Southland, 1997
(b) Proposed Southland Regional Policy Statement, 2012 (and any proposed/subsequent versions)
(c) Regional Water Plan for Southland, 2010
(d) Proposed Southland Water and Land Plan, 2016 (and any proposed/subsequent versions)
(e) National Policy Statement for Freshwater Management, 2014
(f) National Environmental Standard for Sources of Human Drinking Water, 2007
(g) Resource Management (Measurement and Reporting of Water Takes) Regulations, 2010

Staff are able to advise whether this is required, as it is dependant on the location, scale and complexity of your proposal. We invite you to come in for a pre-application meeting with Environment Southland consents staff to discuss this.

END OF FORM

Firdale Farms Ltd

Resource Consent Application to
Environment Southland Council

For Renewal of Discharge Permit 204658 and
Water Permit 204997

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11 October 2017

QUALITY INFORMATION

Reference:	L:\17305 – Effluent Consent Renewal – Firdale Farms Ltd
Document:	20171011 17305 Firdale Farms AEE Final
Date:	11 October 2017
Prepared by:	Zen Gerente
Reviewed by:	Kathryn Hooper
Client Review:	Roger Tuck, Julie Clarke and Brendon Clarke
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1. INTRODUCTION

1.1 Overview of Proposal

Firdale Farms Ltd, the applicant owns a dairy farm approximately 3.5 km south of central Edendale and 4.5 km southwest of Wyndham.

The applicant seeks to renew their existing Discharge Permit 204658 to discharge dairy shed and feed pad effluent generated from up to 700 cows to land and Water Permit 204997 to take groundwater at an abstraction rate of 71,880 litres per day for a dairy operation. These consents are due to expire on 29 January 2018 and replacement consents are hereby sought to authorise the continuation of these activities at the dairy farm. There are no proposed changes in the farm's operation.

This application is being made more than 3 months before the expiry of the current consents and so the applicant seeks to be allowed to continue to operate under the existing consents until the new consents are granted, pursuant to s124(2)-(3) of the RMA.

1.2 The Applicant

Applicant Physical Address: Firdale Farms Ltd
C/-Roger Turk, Julie Clarke and Brendon Clarke
87 Mcmillan Road
No 2 RD
Wyndham 9892

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

1.3 Purpose of Documentation

Pursuant to 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.

1.4 Site Description

The farm is located in Edendale along Dobbie Road (Figure 1).

Figure 1. Location map of the farm (Source: ES Beacon, 2017)

Figure 2. Aerial map of the farm/disposal area

2. DETAILS OF PROPOSAL

The farm covers 236.5 ha with legal description of titles in Table 1 (see Attachment B for Certificate of Titles). The effective area is 234 ha.

Table 1. Legal description of the titles and parcel area of the existing farm

Legal Description	Parcel Area, ha
Lot 1 DP 14493	22.99
Lot 2 DP 14491	13.07
Lot 227 DP 107	47.55
Lot 2 DP 500417	51.90
Lot 3 DP 14491	13.34
Lot 1 DP 13586	12.50
Lot 1 DP 14494	16.25
Lot 230 DP 107	58.92
Total	**236.52**

The dairy farm is located within Mataura River Catchment.

There are no proposed changes to the current FDE discharge and water abstraction activities.

2.1 Discharge Permit

The total milking herd will not exceed 700 cows. The stocking rate will still be 2.99 cows per ha.

The amount of dairy shed effluent disposed of onto land will not exceed that from 700 cows. There are two existing feed pads. The amount of effluent disposed of onto land will not exceed that from 350 cows from each feed pad/wintering pad.

The disposal area will still be 210 ha. The disposal rate is 30 ha per 100 cows.

The existing storage pond has 2,943 m^3 total volume with 1906 m^3 effective capacity. As per Massey DESC, the storage pond requirement should not be less than 1571 m^3 which means the existing storage pond volume is still adequate (Attachment C). The pond complies with the requirement of the Environment Southland with a leakage rate of less than 2 mm/day as per the results of the drop test done on 7-10 April 2017 (see Attachment D for the Drop Test Results). The data used in the test were verified by NIWA (see Attachment E for the Confirmation Letter from NIWA).

The farm has a travelling irrigator. The application rate is 10 mm/hr. The maximum depth of application is 25 mm for each individual application. The travelling irrigator runs for 1-2.5 hours per day.

2.2 Water Permit

The abstraction rate will not exceed 71,880 litres per day or 24,520 m^3 per year from a terrace aquifer in the Edendale groundwater zone for dairy use. Water is to be extracted from the bore F46/0727 in Edendale. The water allocation per cow is 102.69 L per day as opposed to 120 L per day in the previous application.

As of 2 October 2017, Edendale Groundwater Zone has not exceeded its discretionary allocation limit (Table 2). The volume of abstraction under this application is accounted under currently allocated with its consent still valid.

Table 2. Edendale groundwater zone current allocation and discretionary allocation limits under RWP and pSWLP as of 2 October 2017 [Killick, M (ES), personal communication, 2 Oct 2017]

	RWP Edendale Zone	PWLP Edendale Zone
Currently Allocated (m^3)	6,776,746	7,135,340
Discretionary Allocation Limit (m^3)	17,100,000	9,310,000
% of Allocation Limit	40	77

2.3 Compliance

The existing consents AUTH-204658 and AUTH-204997 were granted on 29 January 2008 and 3 June 2008, respectively. The written approvals of the neighbouring property owners were obtained and appended to those applications, which approved the overall application at that time.

Since granting of the existing consents, the applicant has generally demonstrated an excellent compliance record for the discharge permit and water permit, with only one instance of non-compliance in the past decade against the Discharge Permit. The applicant had non-compliance on application depth in 2008 but this was corrected and has never been an issue.

3. DESCRIPTION OF EXISTING ENVIRONMENT

3.1 Land Use, Topography & Climate

The subject site is flat farmland and it is surrounded dairy farms.

The property is an existing dairy farm. All stock are wintered off pastures (25 May to 1 August) with the exception of any cows which calve early/slip. Winter milking is not undertaken. A feed pad and a wintering barn are present on this property, which are used from May to September.

Based on 30 years of rainfall records at Wyndham (being the nearest rainfall station to the property), the property is likely to receive 1079 mm per year. According to Topoclimate data, growing degree days for the property range between 2,050 and 2,100 per annum, which is an average rate for Southland.

3.2 Surface Waterways

According to Beacon, the property is located within the major Mataura catchment, Mataura River catchment boundary and Lower Mataura surface water management zone.

There are no waterways within the property. The nearest tributary from the property is Ives Creek which is about 1 km away and about 3 km downstream from this creek is the Mataura River.

Effluent disposal does not occur within 20 m of any waterway.

General state and trend of water quality in the Catchment

ES have recently released a report delineating the state and trends of water quality in Southland. This report[1] combines State of the Environment (SOE) monitoring datasets from ES, Crown Research Institutes, NIWA and GNS Science and provides an assessment of the state and trends of water quality in Southland rivers, land and groundwater. The state of water quality is assessed against the compulsory objectives within the National Policy Statement for Freshwater Management (NPS-FM; New Zealand Government 2014) and the trigger values for physical and chemical stressors in New Zealand rivers from the ANZECC guidelines (ANZECC 2000). The state assessment is provided for data collected between January 2012 and December 2016. Trend analysis was carried out for a five, ten and 17-year time periods (up to December 2016) depending on whether sufficient data was available.

The nearest SOE site to the property and located in the same catchment is the Mataura River at Mataura Island Bridge. The following table provides a summary of water quality state and trends for the Mataura River at Mataura Island Bridge.

Table 3. Summary of state and trend

Parameters	Measurement	State 2012 – 2016 ES	Trend 2007 – 2016 ES
Mataura River at Mataura Island Bridge			
Nitrate Nitrite Nitrogen Toxicity (NO_3-N)	[a]Median ≤1.0 g/m^3 95th percentile ≤1.5 g/m^3 Lowland median <0.444 g/m^3	A Band Above	Indeterminant
Ammoniacal Nitrogen Toxicity (NH_4-N)	[a]Median ≤0.03 g/m^3 Maximum ≤0.05 g/m^3 [b]<0.021 g/m^3	A Band Below	Insufficient Data
Total Nitrogen (TN)	[b]<0.617 g/m^3	Above	Indeterminant
Total Phosphorus (TP)	[b]<0.033 g/m^3	Below	Indeterminant
Dissolved Reactive Phosphorous (DRP)	[b]<0.01 g/m^3	Below	Deterioration
E. coli	[c]>260 and ≤540/100mL	B Band	Indeterminant

[a]New Zealand Government (2014)

[b]ANZECC 2000 Guideline

[c]Secondary contact recreation

[1] Hodson, R., Dare, J., Merg, M., and Couldrey, M., 2017. *Water Quality in Southland: Current State and Trends. Technical Report April 2017.* Environment Southland publication number 201704, Invercargill.

The results presented in Table 3 above show that water quality samples on the mainstem of the Mataura River at Mataura Island Bridge, have concentrations of TP and DRP below ANZECC 2000 guideline between 2012 – 2016.

Concentrations of TN and NO_3-N exceed ANZECC 2000 guidelines, while concentration of NH_4-N is below ANZECC guidelines. For NH_4-N, the samples are within the Band A attribute state when assessed against the compulsory objectives within the amended National Policy Statement for Freshwater Management 2017. This would indicate that under this framework that there are no observed effects on any species tested. For NO_3-N, the samples are also within the Band A attribute state when assessed against the compulsory objectives within the amended NPSFM 2017. This would indicate that under this framework, there is high conservation value and at this level of NO_3-N, there is unlikely to be effects even on sensitive species.

There are insufficient data over the past 10 years to determine a trend on NH_4-N, and indeterminant trends for NO_3-N, TN, TP and *E. coli*. However, samples for DRP demonstrate a deterioration in water quality for this contaminant.

Site specific water quality monitoring

In accordance with Condition 14 of AUTH-204658, groundwater quality samples may be taken up to twice a year from a well near the farm. Since 2008, all samples were graded "good" except for one sample 4 years ago which was graded "marginal." There was no cited probable cause of the marginal rating but since then, the samples were graded 'good."

3.3 Groundwater

The property is located within the Edendale groundwater zone. The Edendale groundwater zone, comprising 7,529 hectares, occurs in the saturated gravels underlying the Edendale terrace adjacent to the Mataura River.

As per NIWA, the aquifer is bounded to the west and south by Tertiary lignite measure sediments and overlying gravel deposits which mark the extent of the Mataura Valley. Groundwater quality is generally good in the Edendale zone, although it does vary according to location and bore depth. Nitrate and chloride levels are generally elevated but not above the drinking water standard. Recharge to the Edendale groundwater zone is exclusively from rainfall and runoff on the terrace which marks the western boundary.

According to the ES GIS Database, a significant portion of the subject property is mapped within the drinking water limits (8.5-11.3 mg/L), and moderate to high land use (3.5-8.5 mg/L) in terms of regional nitrate levels for 2007-2012[2]. A small portion of the property is within the minor to moderate land use impacts (1.0-3.5 mg/L). These nitrate levels of the property are levels for developed land dominated by intensive agriculture.

[2] Rissmann, C., 2012. *The extent of nitrate in Southland groundwaters: Regional 5 year median (2007-2012 (June)).* Environment Southland publication number 2012-09, Invercargill.

Out of 40 issued consents for groundwater take within the Edendale Groundwater Zone, 26 of these including the applicant's consent are for stock/agricultural activities. However, these only take a total of 11% of the allocated water when compared with industrial activities which takes 73%.

3.4 Estuary

The Toetoes Harbour is a shallow tidal river estuary that is about 4.7 km^2 in size. There is SOE monitoring undertaken in Toetoes Harbour in the form of macroalgal monitoring, fine scale monitoring and broad scale mapping. This monitoring program shows the estuary is in "*good condition*" with *"the presence of nuisance macroalgal blooms, moderate sediment oxygenation, and a benthic community indicating slightly polluted conditions, suggesting that the estuary is in a mesotrophic or moderately enriched state"*[3]. Ecologically, the estuary has diverse habitats with extensive tidal flats and saltmarshes. The estuary provides good habitat for fish, birdlife and tidal flat organisms with the estuary rated as outstanding in the "Wetlands of National Importance to Fisheries Database".

A coastal risk assessment undertaken by Wriggle Coastal Management in 2008 shows that while eutrophication and sedimentation may be poor in some arms of the estuary, overall vulnerability and susceptibility ranges from very low to moderate, as shown in Table 4.

Table 4. Risk assessment for the Toetoes Harbour

[Source: Wriggle Coastal Management, 2008][4]

	Existing condition rating	*Susceptibility rating*	*Vulnerability rating*
Sedimentation	Fair	Low	Moderate
Eutrophication	Fair	Low	Moderate
Disease Risk	Good	Low	Low
Contaminants	Very good	Very low	Very low
Habitat Loss	Fair	Low	Moderate
Invaders	Good	Low	Low
Shellfish	Good	Very low	Very low

Estimated nitrogen loadings to the estuary are low (being the main driver of eutrophication) and the susceptibility of the estuary to stressors is assessed as low-moderate due to the estuary being well flushed (with low residence time) and a wide range of habitat types[4]. More recent estimates of nitrogen loads show they are relatively high, especially when compared to other estuaries in Southland, yet despite this nutrient enrichment condition is still very good due to the high assimilative capacity of this estuary type.

[3] Wriggle Coastal Management, 2009. *Fortrose (Toetoes) Estuary: Fine scale monitoring 2008/09*. Prepared for Environment Southland, June 2009.

[4] Wriggle Coastal Management, 2008. Southland Coast Te Waewae Bay to the Catlins: Habitat mapping, risk assessment and monitoring recommendations. Prepared for Environment Southland, August 2008.

This is illustrated in Figure 2 which shows that at the same nutrient condition grade, shallow tidal river estuaries can have an order of magnitude higher nitrogen loads than shallow tidal lagoons[5].

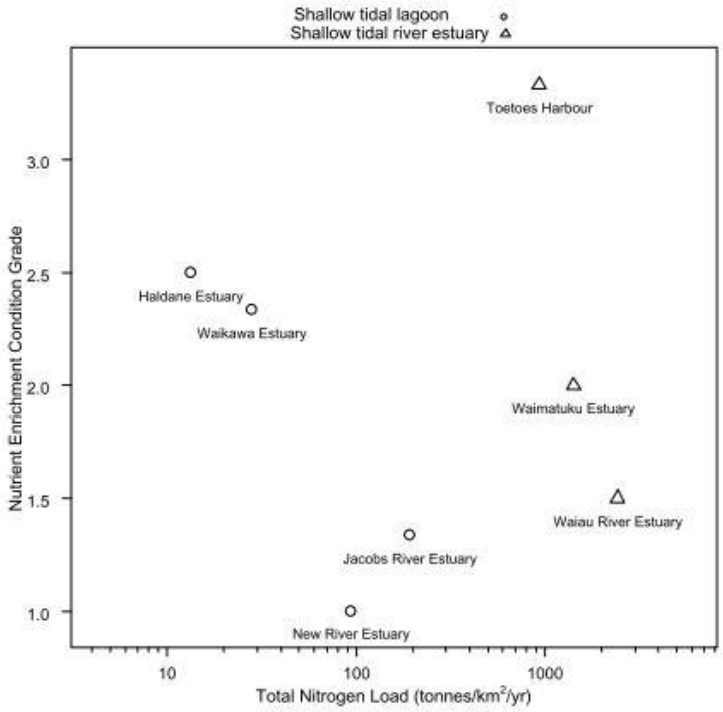


Figure 3. Relationship between condition grade for nutrient enrichment and the estimated nitrogen load [Source: Aqualinc 2014[6]]

3.5 Soils and Physiographic Zones

The following table provides an assessment of soils and physiographic units that occur on the farm, which is generally flat in nature.

[5] Condition grade: >3 is very good condition, 2.6 – 3.0 is good condition, 2.0 – 2.5 is moderate/fair condition and <2 is poor condition.

[6] Aqualinc, 2014. Regional Scale Stratification of Southland's Water Quality – Guidance for Water and Land Management. Prepared for Environment Southland, report number C13055/02.

Table 5. Summary of soils, physiographic zones and risks

Soils				*Farm Dairy Effluent Category and Risk*			*Physiographic Zones*
Type	**Vulnerability Factors**			**Classification & DESC Risk**	**Groundwater Risk**	**Surface water risk**	**Key contaminant pathway**
	Structural Compaction	**Nutrient leaching**	**Waterlogging**				
Edendale	Slight	Moderate	Slight	Category D (Low Risk)	High	Moderate	**Oxidising** -Deep drainage (Main) -Artificial Drainage -Overland Flow

The whole property has Edendale soils. These soils are formed in deep wind-blown loess derived from greywacke and schist rocks. These soils are well drained and have deep rooting depth and high water-holding capacity. Although the soil is well drained, the compact subsoil is slowly permeable which may cause short-term water logging after heavy rainfall.

Oxidising means well aerated with plenty of oxygen. High levels of oxygen allow nitrogen to build up, and therefore this setting has little to no ability to remove nitrogen (i.e. denitrification). When soils are wet, any nitrogen not used by plants leaches down into the underlying aquifer.

Soils generally have good permeability although some soils in this zone have low subsoil permeability making them susceptible to waterlogging and therefore artificial drainage is used. Overland flow can also occur when rainfall intensities exceed the soil's ability to absorb water especially where soils are sloping which is not the case on this farm.

Given the soil type, topography and physiographic zone of the property, the predominant contaminant pathway in the subject property is deep drainage especially for nitrogen. The applicant's good management practice will, therefore, continue to focus on prevention of nitrogen loss such as use of off paddock facilities during autumn/winter period, nutrient management and low rate application of effluent.

4. ACTIVITY CLASSIFICATION

4.1 Regional Effluent Land Application Plan (1998)

Regional Effluent Land Application became operative on May 1998 which includes Rule 5.4.6 that relates to agricultural effluent discharges onto or into land.

Rule 5.4.6

The effluent discharge of feed pad and wintering pad (not covered by Rule 50 mentioned above) is a **discretionary activity** under this rule.

4.2 Regional Water Plan for Southland (2010)

Regional Water Plan for Southland (RWPS) became operative on January 2010 which includes Rule 50(d) that relates to discharge of farm dairy effluent to land, that was not being lawfully undertaken as at 17 July 2010.

Rule 23(c)(i)

The proposed abstraction is from a terrace groundwater source with less than 25 % of the mean annual land surface recharge currently allocated and the average daily rate of take will be less than 2L/s. Meeting the criteria set under Rule 23(c)(i), the proposed groundwater abstraction is considered as a ***restricted discretionary activity*** under the RWPS.

Rule 50(d)

The discharge of dairy shed effluent to land is a **restricted discretionary activity** under this rule.

4.3 Proposed Southland Water and Land Regional Plan (2016)

Rule 35(b)

The Proposed Southland Water and Land Plan (pSWLP) was notified in June 2016 and includes Rule 35 (b) which relates to discharge of agricultural effluent to land as **restricted discretionary** provided "*(i) the discharge is the replacement of a lawfully established discharge pursuant to Sections 124-124C of the RMA, (ii) the existing discharge consent for agricultural effluent specifies a maximum number of animals from which the effluent is collected, and the number is not increasing; and (iii) any pond, tank or structure used to store agricultural effluent prior to discharge is certified by a Chartered Professional Engineer.*"

The farm has an existing discharge permit which authorises a maximum number of cows from which the dairy effluent is generated. There is no proposed increase in the number of cows. The farm has a storage pond which met the pond drop level requirement when it was tested in April this year. Based on the criteria in the Proposed Southland Water and Land Plan, the proposed replacement consent is therefore classified as a **restricted discretionary activity**.

Rule 54(d)

The total allocation is within the primary allocation limit (see Table 2) under the pSWLP. Based on the criteria of Rule 54(d) of pSWLP, the proposed abstraction is considered **discretionary activity**.

4.4 Activity Status

As a result of bundling the individual consent activities, the most restrictive provisions of the relevant plans apply which result to the application to be considered as a **Discretionary Activity**.

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 applicants do 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. No persons are considered to be adversely affected by the proposal, as determined by the larger assessment of environmental effects (Section 6 below). Ultimately however, Council must decide that a person is affected pursuant to Section 95E of the RMA.

Overall, it is considered that this application will 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 Assessment of Alternatives

Clause 6(1) of the Resource Management Act 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 as the assessment of effects will demonstrate in the discussion below.

The farm operation has been existing for years. There are no proposed changes in the current operation. The existing farm have good compliance history and have good practice in terms of effluent disposal and low water consumption. Therefore, no alternatives have been considered.

6.1.1 Land Application

Effluent will be discharged to Edendale Soils with flat topography and within Oxidising physiographic zone. These soils are very versatile with only few issues such as nitrogen losses through deep drainage if nitrogen will not be managed properly. The farm is using low application travelling irrigator. Using this type of irrigator is appropriate to minimise losses to groundwater as effluent can be maintained within the plant root zone and not lost to groundwater via deep drainage (associated with Oxidising Physiographic Zone and consistent with the free draining nature of Category D soil risk).

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 applied only when a soil water deficit exists. This is consistent with the minimum best management criteria for Category D soils, where effluent will continue to be applied.

Careful irrigation scheduling will ensure that low application rates and depths will maintain nutrients within the top 200 mm of soil[7], enabling the assimilation of nutrients into a form which can be used by plants, while facilitating the avoidance of actual or potential adverse effects such as ponding, odour, and nutrient and microbial leaching to groundwater and surface water. Ensuring that effluent is not applied at depths greater than 25 mm will ensure that when there is a soil water deficit, the nutrients should remain in the top 200 mm of soil.

Effluent discharge will observe a 10-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 FDE disposal.

The proposed effluent application method will achieve depths of application not exceeding 25 mm. With regards to the typical tile drain located at least 1 m beneath ground level, the proposed depth of application will observe an appropriate separation distance to subsurface drains, should they occur in the disposal area. Provided that FDE is applied to land in the manner described, then any potential adverse effects associated with ponding, odour, and nutrient leaching and microbial leaching to groundwater and surface water will be avoided as far as reasonably practicable.

6.1.2 Storage

Currently, the farm has effluent pond with 2943 m^3 volume capacity and 1906 m^3 effective capacity. The current system operation of the farm only requires 1571 m^3 based on the Massey Dairy Effluent Storage Calculator. Therefore, the pond is appropriately sized for the sources of effluent. There is no evidence that the pond is not structurally sound as per the Drop Test results conducted in April of this year. Providing adequate storage will enable irrigation of effluent to be deferred when conditions are not suitable.

6.1.3 Nutrient Loading

On average, the cumulative effluent volume per year according to DESC is estimated to be around 15,000 m^3 FDE per year. This equates to 71 m^3/ha/yr based on an irrigation area of 210 ha. Using DairyNZ (2010) guideline N concentration of FDE of 0.45 kg/m^3, this equates to an annual aerial loading rate of 32 kg N/ha/yr (assuming all areas receive an equal amount of effluent). An aerial loading of 32 kg N/ha/yr equates to 21% of ES's recommended maximum aerial rate of 150 kg N/ha/yr for all N inputs, and is less than the limit imposed by current consent conditions.

The current disposal area rate of 30 ha/100 cows is well above the dairy industry best practices which is 8 ha/100

[7] 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

cows. Therefore, this enables reduction in aerial loading which have positive environmental benefits including reducing the accumulation of N in soils particularly being within the Oxidising Physiographic Zone which has little ability to remove nitrogen, and less nitrogen would in theory be able to build up as a result of effluent application to land.

FDE 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.

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 Disposal Area

A total disposal area of 210 ha provides a disposal area to stock ratio of 30 ha per 100 cows, which is greater than the recommendation of 4 ha/100 cows. The available disposal area is also greater than 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 aerial loading limit for N (discussed above) is not exceeded.

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, there should be no significant adverse effects resulting from the siting of the disposal area.

As mentioned in Section 6.1.3 above, the current disposal area to stock ratio mitigates the effects on nitrogen losses and has environmental benefits.

6.1.5 Effects on Water Quality from FDE Disposal

A desktop assessment of the potential effects of the potential loss of N from the disposal of FDE to land has been undertaken.

Using a 290-day milking season, potential effects associated with N leaching have been calculated. It has been assumed that:

- Attenuation (e.g. plant uptake etc) accounts for 97% of total N input[8]; and
- Drainage equates to 321 mm/yr (median land surface recharge for the Edendale Groundwater

[8]Houlbrooke D, Longhurst B, Laurenson S and Wilson T, 2014, *Benchmarking N and P loss from dairy effluent derived nutrient sources*

Management Zone[9]); and

- An average of 50 L/cow/day of FDE will be produced and that FDE has an average TN loading of 0.33 kg/m^3.

Based on these assumptions, the average TN concentration in drainage water as a result of FDE application will be 0.15 g/m^3 for an effluent disposal area of 210 ha.

This concentration is well within limits set by the New Zealand Drinking Water Standards, 2005. According to ES's Beacon GIS, the nearest registered drinking water supply is at Edendale, which is approximately 3.5 km North of the effluent activities. There are no expected any adverse effects associated with nutrient losses from the proposed activity on this drinking water supply.

In addition, all groundwater samples collected by ES at the south eastern well near the waterway complied with the standard which is also an evidence that the current farm operation and its practices do not cause adverse effects on groundwater and nearby surface water.

Other contaminants of concern include sediment and bacterial 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. By restricting effluent irrigation to periods where drainage events are less likely to occur, there is less risk of leaching occurring. The proposed application depths will enable nutrients to be assimilated in the root zone in the top 200 mm of soil and avoid direct contamination of waterbodies via point source discharges.

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 should be avoided as far as reasonably practicable.

6.1.6 Odour

The effects of odour are most likely to occur from the discharge of FDE or from the storage of effluent where it may be encountered beyond the boundary of the site. The effluent pond is located at a suitable distance from the property boundaries and nearest dwellings. The physical location of the effluent infrastructure coupled with the low application rate irrigation and effluent discharge buffers means there is little risk of adverse effects from odour and spray drift on surrounding land owners and occupiers. As such, the effects of odour are avoided.

6.1.7 Contingency Plans

A Gator buddy failsafe effluent and irrigation 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. A tractor pump is also available for use as a back-up pump.

The applicant has contractors with slurry spreaders which 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

[9]Chanut P, 2014, *Estimating time lags for nitrate response in shallow Southland groundwater*, Environment Southland publication number 2014-03, Invercargill.

system is capable of conveying. Any discharges from the slurry tanker will adhere to the rate and depth limits imposed on the consent.

6.1.8 Monitoring

Groundwater quality monitoring is appropriate based on the assessment of the site. Therefore, groundwater sampling at the south eastern well twice a year by ES could be continued and be imposed as a monitoring condition on the replacement discharge permit.

6.2 Groundwater Abstraction

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.

6.2.1 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 as takes less than this are expected to have a minor effect on stream flows. As the proposed take is 71,880 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.

Significant interference effects on neighbouring bores are not expected. The property is surrounded by dairy farms and all of these properties have bores. However, given that the average rate of take is relatively low and no proposed increase in the rate of abstraction, it is unlikely that it would affect any of these bores.

6.2.2 Effects on Groundwater Quality

The low rate of take is 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 applicant will need to ensure that the bore head casing is adequately sealed to prevent the ingress of contaminants.

6.2.3 Efficiency of Use

The proposed rate of take is estimated at 102.69 L/cow/day, which is less than Council's recommendations. The applicant is not opposed to the continued monitoring of water abstraction on the property to ensure that volume abstracted does not exceed the allocation limit.

6.2.4 Monitoring

The proposed abstraction will continue to be metered with records kept on a weekly basis. These records would be provided to Council annually at the end of the 'water year' and upon request.

6.3 Cumulative Effects

Regional scale modelling of N and P losses from agricultural land use in the Southland Region by Aqualinc in 2014[10] 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 make 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.

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 increasing production is predicted to maintain or improve water quality.

The proposal seeks to authorise activities which have been occurring for years. There are no proposed changes in its operation and because of the site's properties, good practice in effluent disposal, nutrient management and efficient water use, the proposal is not expected to cause any adverse effects related to nutrient losses.

6.4 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

Granting consents to authorise the proposed activities will enable the applicants to continue their dairy operation at this site which supports a number of permanent and temporary 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, the dairy sector accounts for 7% of the regional employment in Southland and the dairy sector contributed nearly 17% to Southland regional GDP (2012)[11].

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

[11] Moran, E., Pearson, L., Couldrey, M., & Eyre, K. (April 2017). The Southland Economic Project: Agriculture in Forestry Technical Report. SRC Publication No 2017-02. Page 109.

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.

The proposal is considered to be wholly consistent with the relevant policies of the Iwi Management Plan, and therefore the effects on cultural values are less than minor.

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 is expected within the rural locality. It is expected that the proposal will not have any significant physical effects on the locality over and above that currently experienced.

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

As discussed, the discharge of effluent to land is the preferred method due to the nutrients which can be utilised by pasture and soils, when discharged appropriately. The dairy farm is located within a highly modified ecological landscape and it is anticipated that the proposal will not have any significant effects above that which has been occurring for the past number of years.

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. The land in this area is historically known for farming activity, and the presence of a dairy operation (including groundwater abstraction and effluent discharge to land activities) on this property does not result in any effect contrary to the historical values associated with the natural and physical resources in the vicinity.

There is no waterway in the property and the proposed activities are not expected to have any adverse effects to the nearest water body. The effects on any cultural values of the natural and physical resources of the property, and surrounding area, 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. The assessment of alternatives provided in this report has concluded that this is the preferred solution for managing FDE 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

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.

6.5 Good Management Practices

Given the topography, absence of waterway, soil type and physiographic zone present, good practice to mitigate potential adverse effects associated with dairy farm operation is centred on reducing nutrient losses.

The most effective Good Management Practices (GMPs) in the physiographic zone of the farm include measures for reducing the effects of deep drainage and artificial drainage. A range of GMPs are either being undertaken and planned to initiate based on the FAFP. Key GMPs being adopted and wish to initiate by the applicant to manage the effects of deep drainage and artificial drainage on the farm include:

- Off paddock the cows 100% using the feed pad and the wintering barn during winter;
- Use of silage pads;
- Timing and placing of fertiliser – no application on wet soils or during heavy rains;
- Soil and weather checks before effluent application; and
- Nutrient management plan.

Nutrients will be managed by way of a nutrient budget and nutrient management plan to be prepared annually. Applying fertiliser in accordance with nutrient budget recommendations and annual soil testing will avoid excess leaching of nutrients to water resources. This ensures that imported fertilisers are managed in a way that maximises pasture production on the farm and minimises losses to water via leaching.

6.6 Summary

The collection, treatment and disposal of effluent is 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 and continued discharge of effluent to land.

The proposed activities will enable the applicant to provide for their economic and social wellbeing while ensuring that these activities will not cause any adverse environmental effects through good practice and no cultural values will be compromised.

Overall, no adverse effects over and above those occurring from the existing dairy farm (which forms part of the existing environment) are proposed. For the reasons outlined in this report, such as the implementation of the FAFP/FEMP, the proposal may even result in a reduction in environmental effects associated with the dairy farm.

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

The proposal is consistent with the purpose and principles of the RMA, as outlined in Section 6. The proposal will have less than minor effect on the surface and groundwater resources ability to meet the reasonably foreseeable needs of future generations, or on the life-supporting capacity of the waterbodies within the Mataura Catchment and any ecosystems associated with them. The proposal ensures that adverse effects on the environment are avoided, remedied or mitigated.

There are no matters of national importance under Section 6 of the RMA that will be affected by the proposal. The proposal is also consistent with the requirements of Section 7 of the RMA, with particular regard given to the maintenance and enhancement of the quality of the environment and the efficient use and development of natural and physical resources. Regarding Section 8, the proposed activity is not inconsistent with the principles of the Treaty of Waitangi.

7.2 Section 104(1)(b) 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. Documentation in this section are noted as being:

(i) a National Environmental Standard;

(ii) other regulations;

(iii) a National Policy Statement;

(iv) a New Zealand Coastal Policy Statement;

(v) a Regional Policy Statement or Proposed Regional Policy Statement;

(vi) a plan or proposed plan; and

Relevant matters are discussed in the following sections.

7.2.1 National Environmental Standard

Resource Management (National Environmental Standards for Sources of Human Drinking Water) Regulations 2007.

Regulations 6, 7 and 8 of the Resource Management (National Environmental Standards for Sources of Human Drinking Water) Regulations 2007 (NES) apply to water and discharge permits issued by Regional Councils. The nearest drinking water supply is at Edendale, over 3 km from the proposed disposal activities.

The discharge is not directly to water and it is accepted that a 100-m buffer zone from potable water abstraction points will apply, of which none are located on the property or within the property boundary, as determined by a groundwater bore radius search. This buffer distance was developed with involvement of the public health authority to avoid effects on drinking water supplies. Overall, the proposal offers sufficient mitigating factors that they avoid affecting any registered drinking water supplies that provide 501 or more people with drinking water for 60 or more calendar days each year. Furthermore, the emergency provisions of the NES need not apply as the effects of the activity will not be significantly adverse (Regulations 11 and 12).

7.2.2 Regional Effluent Land Application 1998

The following policies, which give effect to the plan's objectives, and relevant to this application are:
Policies 4.2.1, 4.2.2, 4.2.3, 4.2.6, 4.2.7, 4.2.9 and 4.2.10

The mitigation measures and good management practices of the farm protect the sustainability of the soil ecosystem. The effluent will be discharged to land while observing good practice to avoid adverse effects to surface and ground water that can affect human and animal health. Monitoring will also be part of good practice methods that the farm will implement.

Consideration of Te Tangi a Tauira is given in Section 7.2.5 of this report and is thus consistent with Policy 4.2.8.

7.2.3 Regional Water Plan for Southland 2010

The following policies, which give effect to the plan's objectives, are relevant to this application for resource consent.
Policy 1A – Take into account Iwi Management Plans
Policy 6 – Non-regulatory methods
Policy 7 – Prefer discharges to land over discharges to water
Policy 13 – Discharge of untreated effluent
Policy 14A – Determining the term of a water permit
Policy 21 – Reasonable use of water
Policy 22 – Require measuring devices on all new water permits
Policy 23 – Impose review conditions on water permits
Policy 25 – Avoid, remedy or mitigate adverse effects arising from point source and on-point source discharges on groundwater quality unless is it consistent with the promotion of the sustainable management of resources
Policy 28 – Manage groundwater abstraction to avoid significant adverse effects on storage volumes, existing users, surface water flows and groundwater quality
Policy 30 – Use a staged management approach when allocating groundwater, recognise different aquifer types, require consent applications to be supported by a level of information corresponding to the level of risk, impose monitoring that corresponds to the level of risk
Policy 31 – Interference effects
Policy 31A - Matching discharges to land to the level of risk posed by risk factors including the nature and quantity of contaminants, topography, soil drainage characteristics, climate, proximity to sensitive receptors, natural hazards

Policy 31C – Manage discharges to land to avoid, remedy or mitigate adverse effects on soil quality, amenity values, ecological factors, historic, cultural and traditional values, natural character, outstanding natural features
Policy 31D – Encourage the beneficial reuse of materials
Policy 35 – Stock access to surface water
Policy 42 – Avoid adverse effects associated with FDE by matching FDE management to receiving environment risk
Policy 42A – Provide for the discharge of FDE that is lawfully being undertaken up to and including 17 July 2010
Policy 43 – Match consent duration and inspection and audit requirements on FDE consents to the level of risk
Policy 44 – Manage potential adverse environmental effects associated with silage storage

In accordance with Policy 1A, an assessment of the proposal against the Iwi Management Plan is given in Section 7.2.5 below.

Consistent with Policy 6, best management practices are promoted on farm, as demonstrated in the attached Focus Activity Farm Plan (FAFP).

The proposed effluent disposal is to land, consistent with Policies 7 and 13. Policies 31A, 31C, 31D and 42 are for ensuring that any adverse effects of effluent discharge to land are appropriately mitigated, remedied and avoided where possible. The risks to the receiving environment have been assessed above, and the proposed effluent discharge and level of management to be implemented as outlined in the attached FAFP match the level of the environmental risk identified, while enabling the re-use of effluent as a soil conditioner and the return nutrients for plant uptake and growth. The good practice on effluent discharge to land is also consistent with Policy 25 which has the goal to protect groundwater from deterioration.

Section 6 of this report has assessed sufficient water is available, the abstraction is sustainable, with any effect on aquifer sustainability as less than minor and that efficient water use is promoted on the property, which is particularly consistent with Policy 28. The rate of take from each of the bores will be no more than 2 L/s therefore stream depletion and Policy 29 does not apply.

In terms of Policy 21, the application is consistent with the Council's guideline for water usage. A water meter is installed which is consistent with Policy 22.

The proposed allocation is within the primary allocation limits and unlikely to have interference effects which is in accordance of Policy 31. All stock is to be excluded from waterbodies, consistent with Policy 35.

The applicant is not opposed to review conditions and further assessment of policies 14A and 43 is given in Section 8 below.

There is no proposed change on the FDE discharge and this is lawfully established before July 2010 and in accordance with Policy 42A. The silage pad is properly located away from water bodies which is consistent with Policy 44.

Overall, the proposal is consistent with the relevant policies of the RWPS.

7.2.4 Proposed Southland Water and Land Plan 2016

The following policies, which give effect to the plan's objectives, are relevant to this application for resource consent.

Policy 2 – Take into account iwi management plans

Policy 10 – Oxidising In the Oxidising 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 deep drainage, and overland flow and artificial drainage where relevant;

2. having particular regard to adverse effects on water quality from contaminants transported via deep drainage, and overland flow and artificial drainage where relevant when assessing resource consent applications and preparing or considering management plans;

Policy 13 – Manage land use activities and discharges… so that water quality and the health of humans, domestic animals and aquatic life, is protected.

Policy 14 – Preference for discharges to land

Policy 15 – Maintaining and improving water quality by avoiding discharge to land unless the adverse effects can be avoided, remedied or mitigated

Policy 16.2. Requiring all farming activities, including existing activities, to either implement a Management Plan, as set out in Appendix N.

Policy 17.1 – Avoid adverse effects on water quality, and avoid as far as practicable other adverse environmental effects of the operation of, and discharges from effluent management systems

Policy 17.2 – Manage effluent systems and discharge from them through appropriate design, construction, siting, maintenance and operation.

Policy 18 – Stock exclusion from waterbodies

Policy 20 – Managing the abstraction of groundwater so as to avoid, remedy or mitigate adverse effects

Policy 21 – Manage the allocation of groundwater by determining allocation limits

Policy 22 – Manage the effects of groundwater abstraction by ensuring interference effects are acceptable and managing effects on surface water bodies

Policy 40 – Factors to consider when determining the term of resource consents

Policy 41 – Consider the magnitude of effects and risk when determining monitoring requirements

Policy 42 – When considering applications for water permits… installation of water measuring devices will be required

Te Tangi a Tauira is considered below. A low rate of FDE application is implemented due to the risk factors associated with oxidising physiographic zone and suitable buffers from sensitive receptors will be observed. The effluent management system will be operated in accordance with current best practice. This application seeks to discharge FDE to land rather than water.

At the request of the applicant, Environment Southland has prepared a Focus Activity Farm Plan (FAFP). The FAFP outlines the GMP's that the applicant will adopt to avoid, remedy or mitigate any actual or potential effects of the proposed activity. This will also be refined and reviewed periodically to serve as the Farm Environmental Management Plan (FEMP). The plan is consistent with Policy 10 for the identified

Physiographic Zone. The management techniques set out within the FAFP manage deep drainage which ensures that the proposal is achieving the purpose of Policy 10.

The applicant has adopted best practice principles in the design of the effluent systems, including provision of effluent storage and low rate effluent application which in conjunction with the proposed management techniques documented in the FAFP will enable the activities to be undertaken and managed so that they minimise potential effects on water quality.

The second part of Policy 16 requires that all farming activities manage effects on water quality. The FAFP as mentioned above will be refined and used as FEMP for the proposal in accordance with Appendix N and will be reviewed periodically.

The application is consistent with Policies 17, 18, 20, 21 and 22. The effluent management system has been designed by an appropriately qualified person and in accordance with best management practice in terms of low rate application and deferred storage. The applicant is also proposing an effluent disposal area exceeding both the minimum 4 ha/100 cows and the recommended best practice of 8 ha/100 cows. There are no waterways on the property, achieving the purpose of Policy 18. In terms of the proposal to abstract water, the volumes of water to be abstracted are an efficient use of the resource, and are within the primary allocation threshold under the pSWLP which signals that the proposal is consistent with Policies 20, 21 and 20.

Further assessment of Policy 40 is given in Section 8 below. Groundwater sampling is being done by Council twice a year and applicant is not opposed to include this as a condition in the Discharge Permit. The applicant will also do regular visual checks to avoid ponding while observing good practice on nutrient management and effluent management which are consistent with Policy 41. Water meter is installed in accordance with Policy 42.

Overall, the application is considered to be consistent with the above policies of the pSWLP.

7.2.5 Other Documentation

Te Tangi a Tauira is the Iwi Environmental Management Plan for the Murihiku area. This plan replaces Te Whakatau Kaupapa O Murihiku which is recognised in Policy 1.2 of the RPS. The application is not contrary to the relevant policies of Te Tangi a Tauira, particularly as;

- The provision of buffer zones to water abstraction sites and waterways;
- The application of effluent is proposed to land rather than water;
- The applicant proposes best practice for land application of managing farm effluent;
- Deferred application of FDE is provided for;
- Nutrient loading from effluent discharges to land will be within industry best practice limits;
- The system and management practices are considered appropriate for the risks associated with the receiving environment;
- Water abstraction will be monitored with metering results to be submitted to Council;
- The applicant is not averse to appropriate potential monitoring conditions; and

- 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 can be undertaken in a manner which avoids contaminants from entering water through controls on application method and conditions of consent. As 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 as might otherwise occur in the event that the discharge was directly to water, which would result in a worse environmental outcome.

There are no matters under Section 107(1) of the RMA that would require the consent authority to decline this application.

8. CONSENT DURATION, REVIEW AND LAPSE

With regard to consent duration, special consideration has been given to Policies 14A and 43 of the RWPS and Policy 40 of the pSWLP.

A consent term of 10 years is considered to be appropriate for these consents.

The potential effects of the proposed activities are understood reasonably well and these are to be managed as far as reasonably practicable. Council's level of knowledge regarding the underlying 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.

The extent and nature of the actual and potential adverse effects of the activities on the existing environment were assessed in this document and concluded to be generally no more than occurring historically in the existing environment.

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.

The dairy farm, as supported by the discharge and water permits has required significant investment in the establishment and maintenance of the dairy farm. The activities are fairly permanent when considering the level of investment and existing infrastructure.

A common expiration date for the permits is appropriate.

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

The applicant is happy for ES to impose standard review conditions in accordance with Sections 128 and 129 of the RMA. These consents must not be exercised until any current consents for the same activity have been surrendered or have expired.

9. CONCLUSION

In concluding, a decision to grant consent pursuant to Section 104B under delegated authority can be made on the basis that:

a) it is expected that the adverse effects on the environment will be no more than minor.

b) the proposal meets the non-notification requirements of Section 95A of the RMA.

c) the proposal is consistent with the requirements of the RMA, Council policy and other relevant matters.

Granting of the consents will be consistent with the purpose of the RMA for the reasons explained within this report. The proposed activities are not expected to result in further degradation of water quality and potential adverse effects will be avoided, remedied or mitigated as far as practicable.

Attachment A: Certificate of Incorporation

NEW ZEALAND | COMPANIES OFFICE

Certificate of Incorporation

FIRDALE FARMS LIMITED

1170577

NZBN: 9429036725397

This is to certify that FIRDALE FARMS LIMITED was incorporated under the Companies Act 1993 on the 30th day of October 2001.

REGISTRAR OF COMPANIES NEW ZEALAND

Registrar of Companies
11th day of September 2017

For further details relating to this company check
http://www.companies.govt.nz/co/1170577
Certificate generated 11 September 2017 02:41 PM NZST

SCAN TO VIEW OUR REGISTRATION DETAILS

Attachment B: Certificate of Titles

COMPUTER FREEHOLD REGISTER
UNDER LAND TRANSFER ACT 1952

Search Copy

R.W. Muir
Registrar-General
of Land

Identifier	**SL11C/467**
Land Registration District	**Southland**
Date Issued	05 August 1997

Prior References
SL166/91 SL8D/202

Estate	Fee Simple
Area	36.3335 hectares more or less
Legal Description	Lot 3 Deposited Plan 14491 and Lot 1 Deposited Plan 14493

Proprietors
Firdale Farms Limited

Interests

Subject to Section 241 (2) Resource Management Act 1991(affects DP 14491)

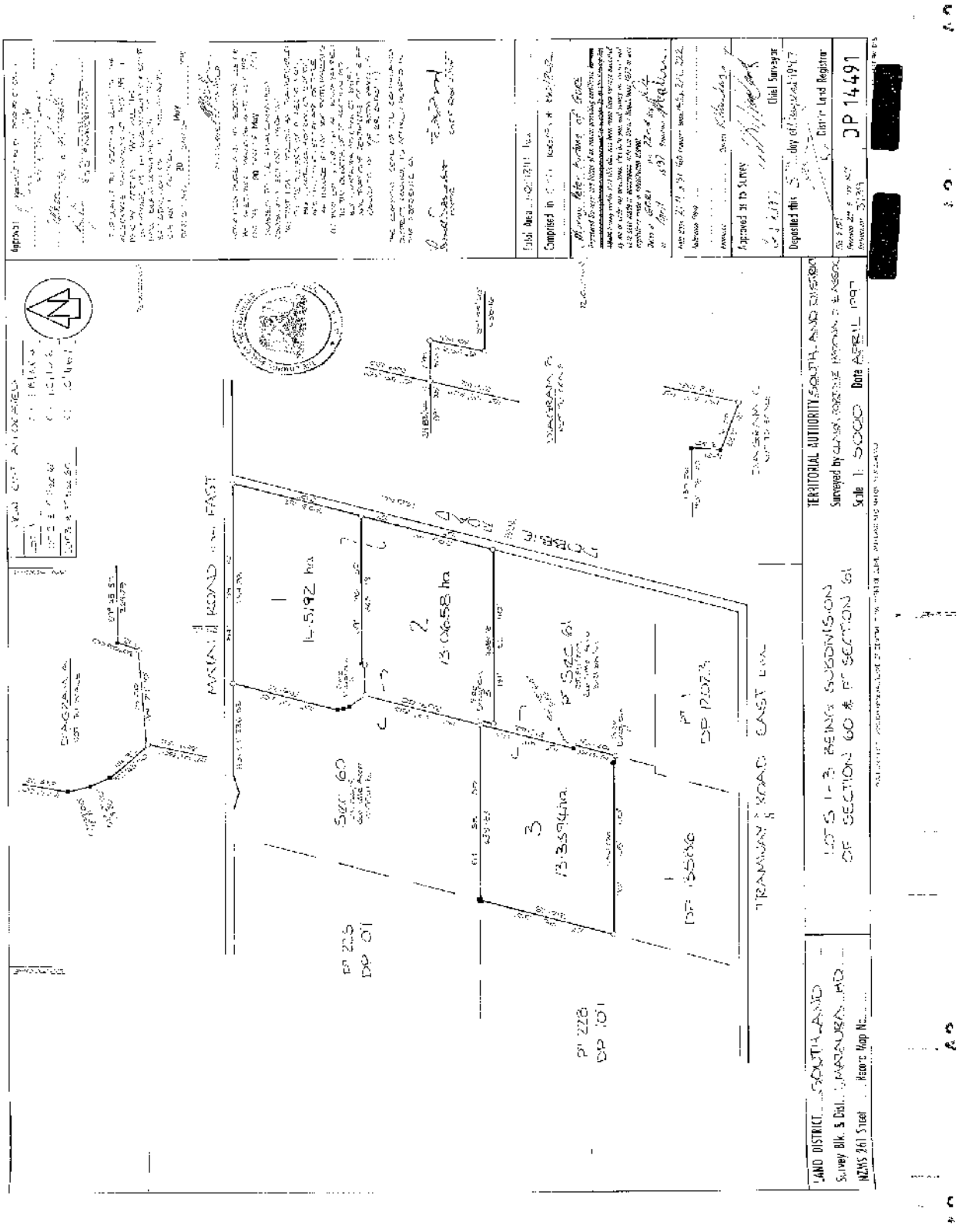
Subject to Section 206 Land Act 1924

5257226.4 Mortgage to Rabobank New Zealand Limited - 20.6.2002 at 9:00 am

5257226.5 Mortgage to John Henry Ayers and Julie Ann Clarke and to Roger John Collins in shares - 20.6.2002 at 9:00 am

6890563.1 Variation of Mortgage 5257226.4 - 2.6.2006 at 9:00 am

Identifier **SL11C/467**



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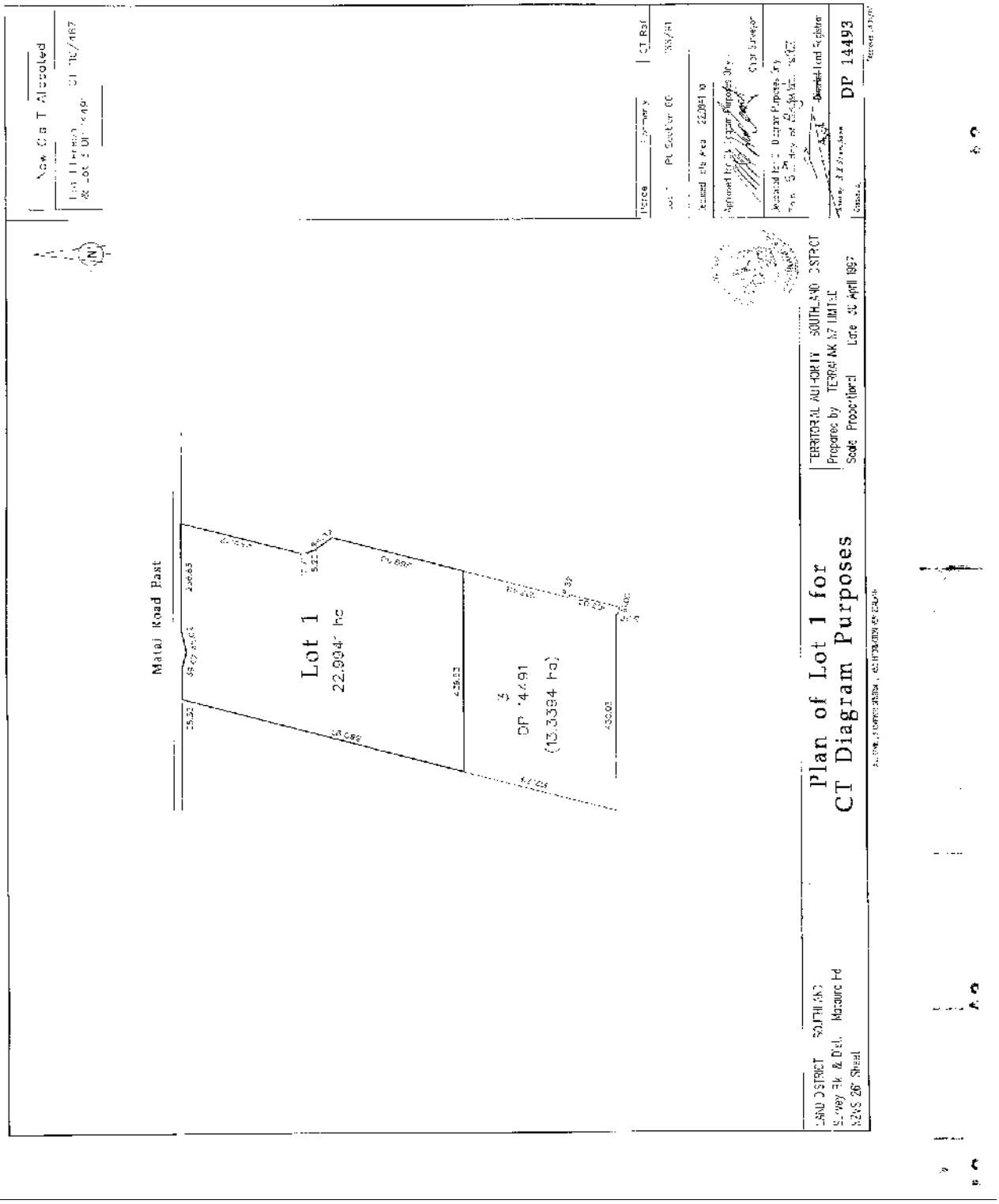


COMPUTER FREEHOLD REGISTER
UNDER LAND TRANSFER ACT 1952

Search Copy

R.W. Muir
Registrar-General
of Land

Identifier	**SL11C/466**
Land Registration District	**Southland**
Date Issued	05 August 1997

Prior References
SL166/91 SL8D/202

Estate	Fee Simple
Area	29.3126 hectares more or less
Legal Description	Lot 2 Deposited Plan 14491 and Lot 1 Deposited Plan 14494

Proprietors
Firdale Farms Limited

Interests

Subject to Section 241 (2) Resource Management Act 1991 (affects DP 14491)

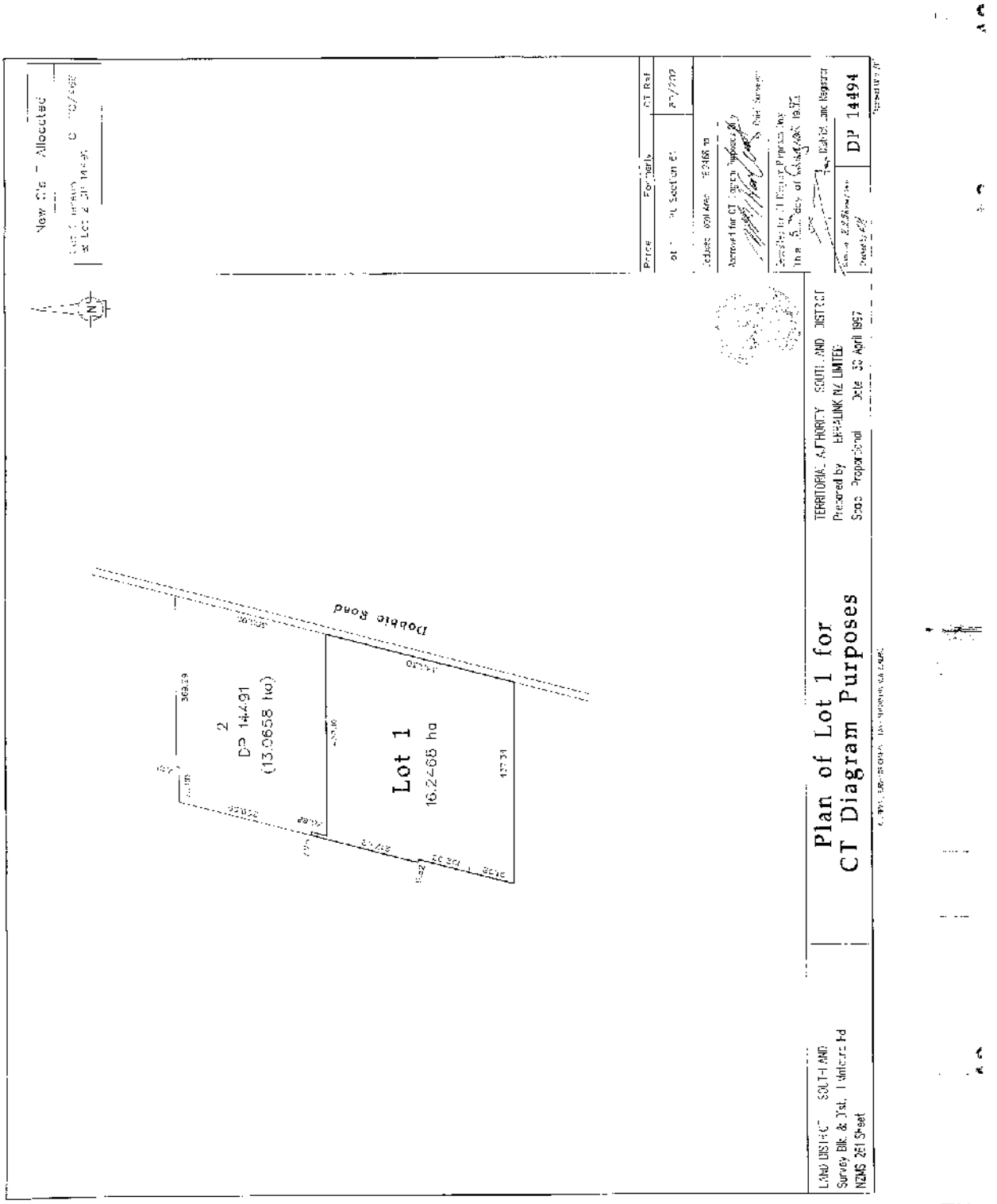
Subject to Section 206 Land Act 1924

7832323.4 Mortgage to Rabobank New Zealand Limited - 29.5.2008 at 12:09 pm

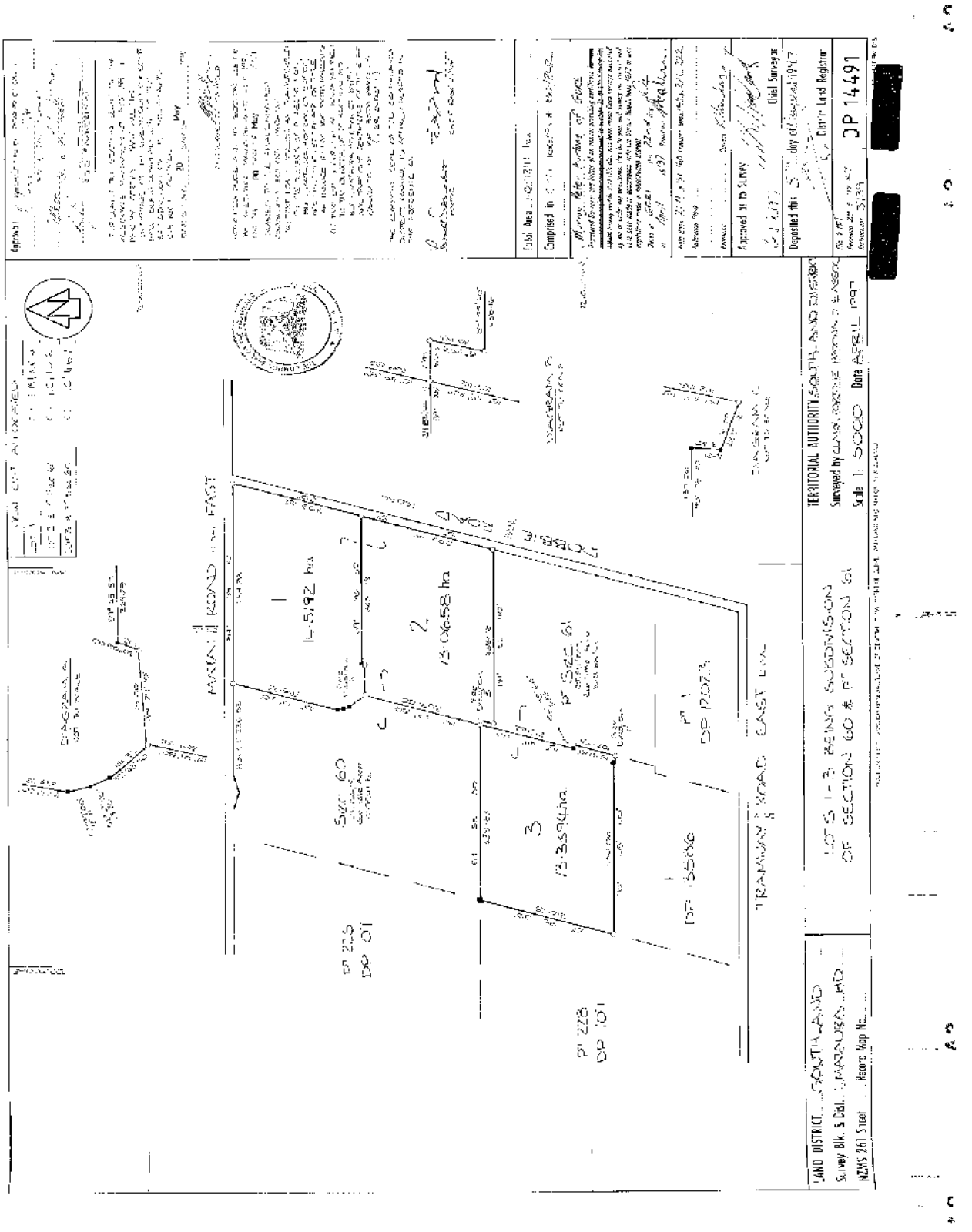
7832326.1 Mortgage to Julie Ann Clarke and John Henry Ayers - 29.5.2008 at 12:13 pm

7832333.1 Mortgage to Julie Ann Clarke and Roger John Tuck - 29.5.2008 at 12:13 pm

Identifier **SL11C/466**



Identifier **SL11C/466**



COMPUTER FREEHOLD REGISTER
UNDER LAND TRANSFER ACT 1952

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R.W. Muir
Registrar-General
of Land

Identifier	**SL9C/860**
Land Registration District	**Southland**
Date Issued	21 September 1990

Prior References
SL72/178

Estate	Fee Simple
Area	106.4728 hectares more or less
Legal Description	Lot 227 and Lot 230 Deposited Plan 107

Proprietors
Firdale Farms Limited

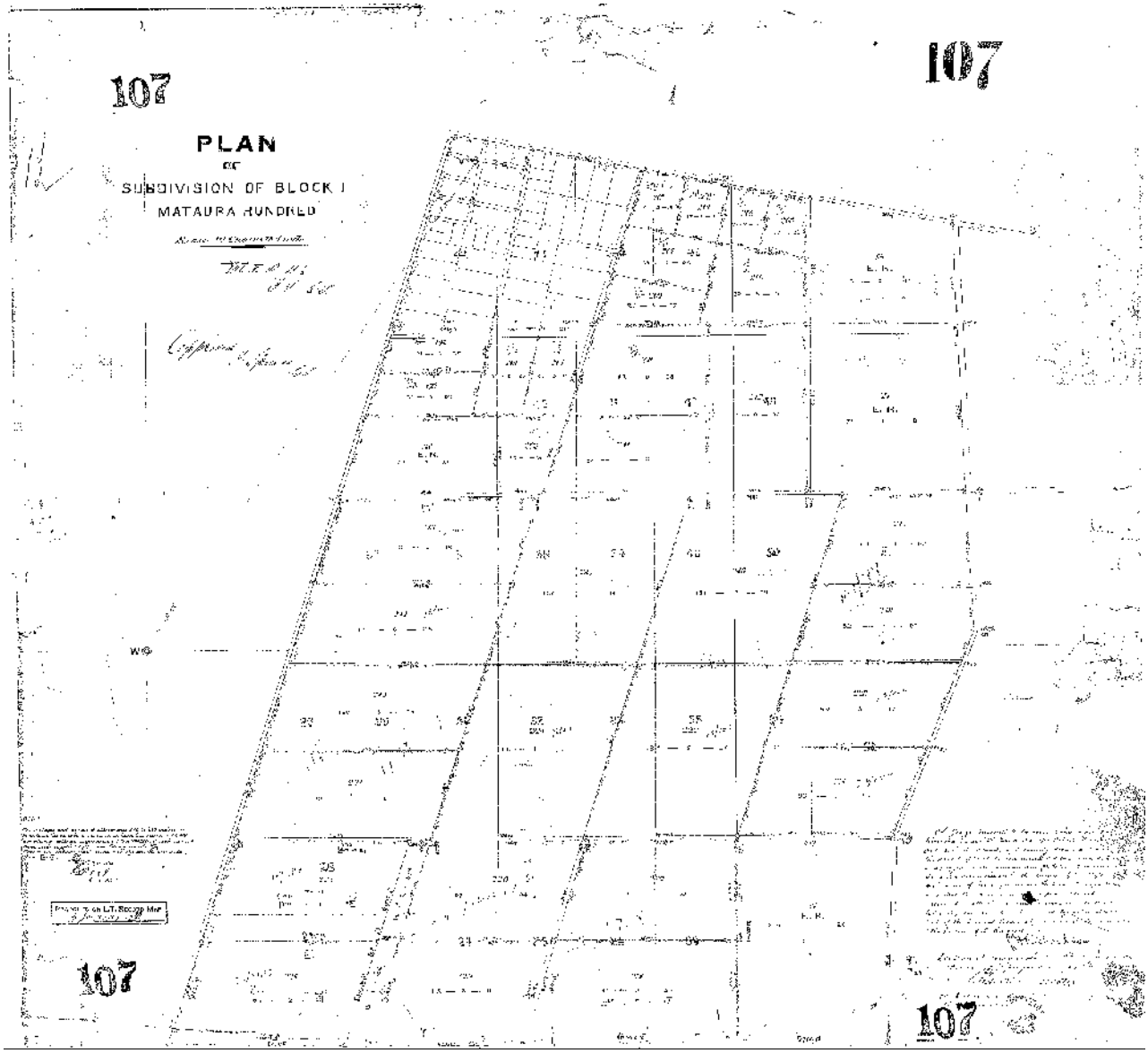
Interests

7832323.4 Mortgage to Rabobank New Zealand Limited - 29.5.2008 at 12:09 pm

7832326.1 Mortgage to Julie Ann Clarke and John Henry Ayers - 29.5.2008 at 12:13 pm

7832333.1 Mortgage to Julie Ann Clarke and Roger John Tuck - 29.5.2008 at 12:13 pm

Identifier **SL9C/860**



COMPUTER FREEHOLD REGISTER
UNDER LAND TRANSFER ACT 1952

Search Copy

R.W. Muir
Registrar-General
of Land

Identifier	**753219**
Land Registration District	**Southland**
Date Issued	07 September 2016

Prior References
SL11A/203

Estate	Fee Simple
Area	64.4000 hectares more or less
Legal Description	Lot 2 Deposited Plan 500417 and Lot 1 Deposited Plan 13586

Proprietors
Firdale Farms Limited

Interests

Subject as to Lot 1 DP 13586 to Section 206 Land Act 1924

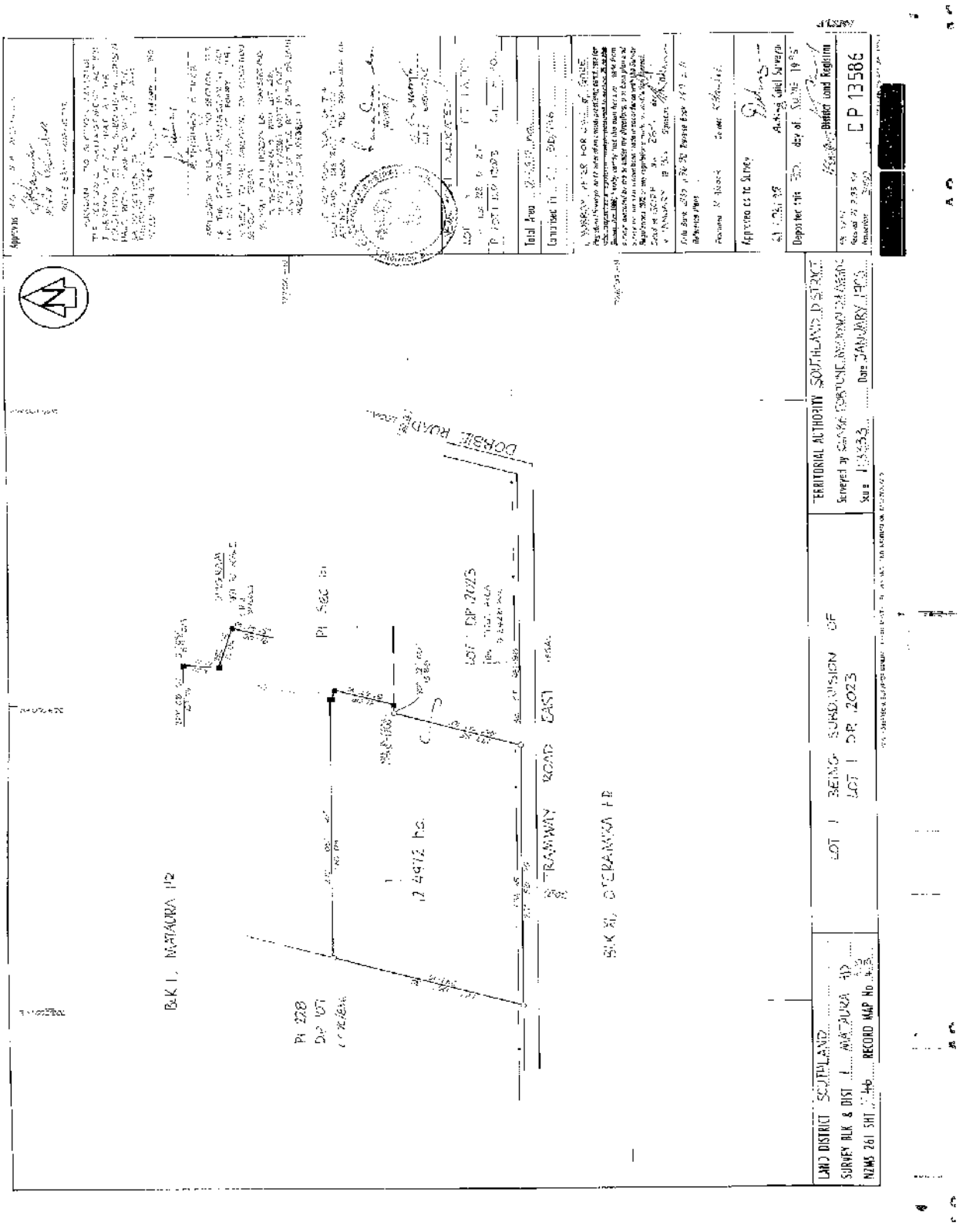
5257226.4 Mortgage to Rabobank New Zealand Limited - 20.6.2002 at 9:00 am

5257226.5 Mortgage to John Henry Ayers and Julie Ann Clarke and to Roger John Collins in shares - 20.6.2002 at 9:00 am

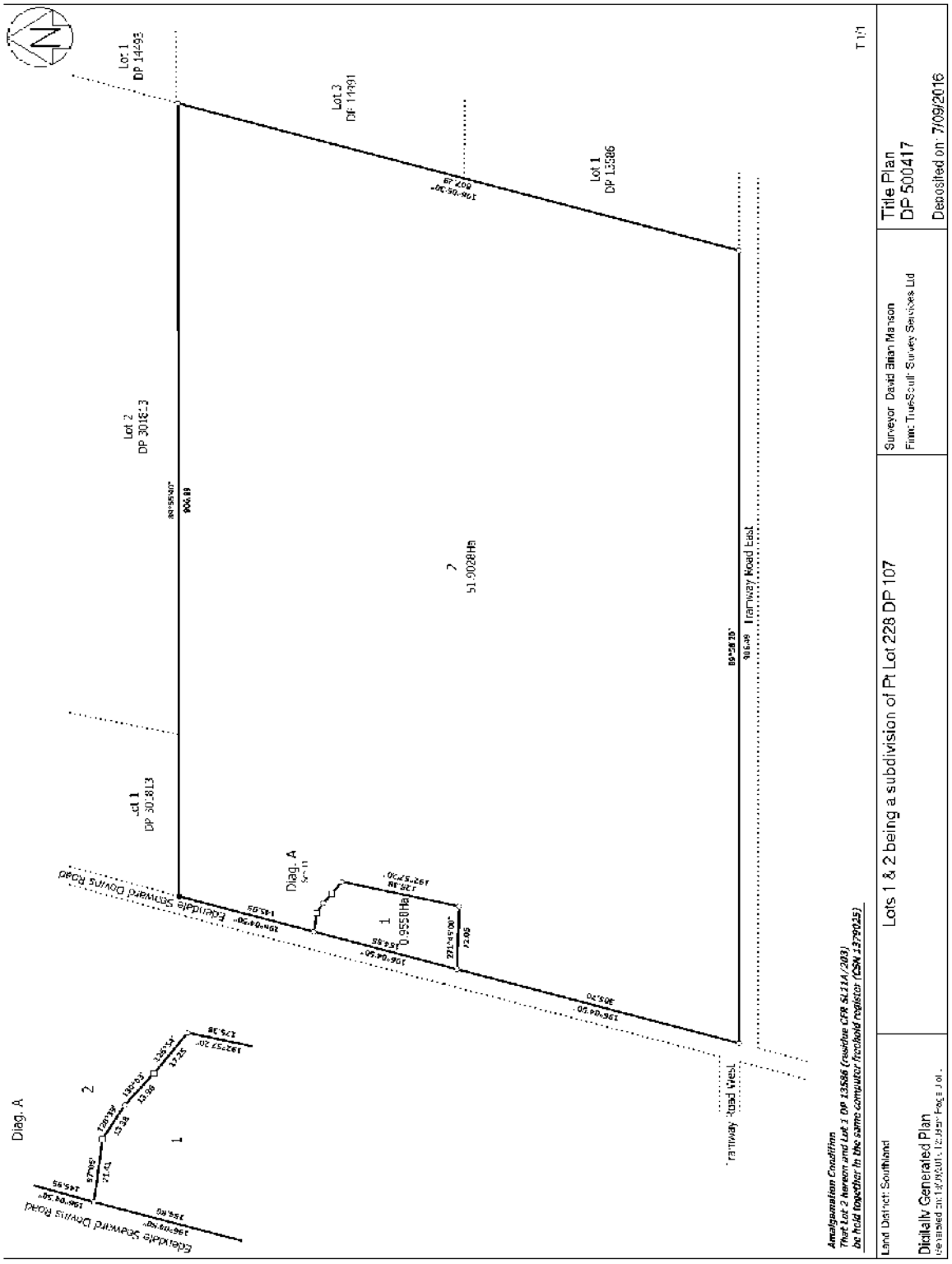
6890563.1 Variation of Mortgage 5257226.4 - 2.6.2006 at 9:00 am

Subject to Section 241(2) Resource Management Act 1991 (affects DP 500417)

Identifier **753219**



Identifier **753219**



Attachment C: Massey Dairy Effluent Storage Calculator

Dairy Effluent Storage Calculator
Summary Report

Regional authority: Environment Southland Regional Council
Authorised agent: Landpro Ltd
Client: Firdale Farms Ltd - 50 Dobbie Road (with Old Feedpad and Wintering Barn)
Program version: 1.47
Report date: Monday, October 2, 2017
General description:

The farm is milking 700 cows and has a disposal area of 210 ha with the whole farm being low risk soils.
The rainfall site used for this calculation differs from that used for the previous consent. The Wyndham station has been used as it is nearer the property than Woodlands Garvie Road and has a higher rainfall than what is measured on the property. This allows for additional safety in storage capacity.
The average daily volume of wash down water is provided by the client based on their usage.
The feedpad is uncovered and not diverted from the pond. The wintering barn roof water does not go to effluent pond.
Irrigation is calculated at 2.5 hours per day pumping throughout the year.
The existing pond has an effective capacity of 1906 cubic metres. Freeboard used is 0.5m as opposed to 0.3m in previous calculation.
Based on the input data, the current storage capacity is adequate to meet the 90% probability that is 1571 cubic metres.

Climate

Rainfall site: Wyndham
Mean annual rainfall: 1079 mm/year

Effluent Block

Area of low risk soil: 210.0 hectares
Minimum area of high risk soil: 0.0 hectares
Surplus area of high risk soil: 0.0 hectares

Wash Water

Yard wash:

- Milking season starts: 08 August
- Milking season ends: 25 May

Month	Number of Cows	Hours in Yard	Wash Volume (cubic metres)
January	700	6.0	20.0
February	700	6.0	20.0
March	650	6.0	20.0
April	600	5.0	18.0
May	550	4.0	15.0
June	0	0.0	0.0
July	0	0.0	0.0
August	400	4.0	15.0
September	550	5.0	18.0
October	700	6.0	20.0
November	700	6.0	20.0
December	700	6.0	20.0

Feedpad wash:

Month	Number of Cows	Hours on Pad	Wash Volume (cubic metres)
January	0	0.0	0.0
February	0	0.0	0.0

March	0	0.0	0.0
April	0	0.0	0.0
May	350	5.5	0.0
June	350	24.0	0.0
July	350	24.0	0.0
August	300	24.0	0.0
September	0	0.0	0.0
October	0	0.0	0.0
November	0	0.0	0.0
December	0	0.0	0.0

Animal shelter wash:

Month	Number of Cows	Hours in Shelter	Wash Volume (cubic metres)
January	0	0.0	0.0
February	0	0.0	0.0
March	0	0.0	0.0
April	0	0.0	0.0
May	350	5.5	0.0
June	350	24.0	0.0
July	350	24.0	0.0
August	300	24.0	0.0
September	150	24.0	0.0
October	0	0.0	0.0
November	0	0.0	0.0
December	0	0.0	0.0

Irrigation

Winter-spring depth: 10 mm
Spring-autumn depth: 20 mm
Winter-spring volume: 125 cubic metres
Spring-autumn volume: 125 cubic metres
Irrigate all year? Yes

Catchments

Yard Area: 1549 square metres
- **Diverted?** Yes
- **- diversion start:** 21 May
- **- diversion end:** 20 May

Shed Roof Area: 500 square metres
- **Diverted?** Yes

Feedpad Area: 1750 square metres
- **Covered?** No
- **Diverted?** No

Animal Shelter Area: 3187 square metres
- **Covered?** Yes
- **Diverted?** Yes
- **- diversion start:** 01 May
- **- diversion end:** 30 April

Other Areas: 103 square metres

Storage

Pond/s present? Yes
No. of ponds: 1 pond/s

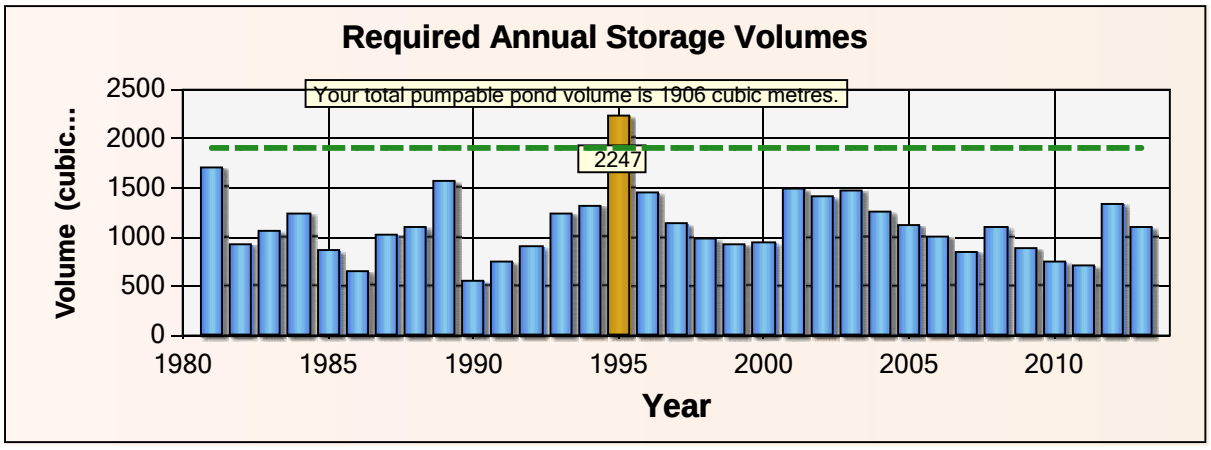
Includes irregular ponds?	No
Pond 1	
- total volume:	2943 cubic metres
- pumpable volume:	1906 cubic metres
- surface area:	1792 square metres
- width:	28.0 metres
- length:	64.0 metres
- batter:	3.0:1
- total height:	2.5 metres
- pumped?	Yes
Tank/s present?	No
Emergency storage period:	3 days

Solids Separation

Solids separator/s present?	No

Outputs

Maximum required storage pond volume:	2247 cubic metres
90 % probability storage pond volume:	1571 cubic metres
During the period from:	01 July 1980
To:	30 June 2013



Attachment D: Drop Test Results

Dairy Green Ltd
Practical Engineering Solutions
Consents, Effluent, Stock water, Irrigation
Design through to Installation
Irrigation NZ Accredited Designer

15 April 2017

Roger Tuck,
Firdale Ltd,
87 McMillan Road,
R D 2
Wyndham

Dear Roger,

Drop Test Results: Firdale Farms Ltd Effluent Pond, 7 – 10 April 2017

1. Background
The current discharge consent for the property is 204658.

As required by Environment Southland, to confirm your effluent pond at Seaward Downs is not leaking, a drop down test was carried out between the 7 and 10 April 2017. This was a repeat test as a test carried out between 19 & 21 February was inconclusive.

Site and Set Up
The farm is located at Dobbie Road, Seaward Downs.

Effluent flows to a sand trap and pump sump before being pumped to the storage pond. The pond was isolated by not allowing any inflow and by not pumping out during the test period.

The dimensions of the storage pond at the water level during the test period were:
North 20.8m
East 61.0m
South 24.1m
West 60.5m

The dimensions of the storage pond at the top bank level during the test period were:
North 26.2m
East 66.0m
South 28.0m
West 65.0m

10 Kinloch Street, PO Box 5003, Waikiwi, Invercargill 9843
Phone 03 215 4381, Fax 03 215 4391
Email: scandrettrural@xtra.co.nz

The total pond surface area was 29 % greater than the wetted area during the test.

The irrigation pond depth was 3.2m including 0.5m freeboard. At the time of the test the liquid level was 0.7m below top bank height, i.e. 92% full.
We understand that the pond has not been de-sludged in the previous 12 months, and no sludge or crust was observed on the surface during the test.

Below is an aerial photo that shows the pond, dairy shed and yard. The laser drop test unit was installed at the middle of the east bank as marked.

3. Test Methodology

You were notified when the test was to be run and confirmation was received that there would be no liquid inflow or outflow during the test period.
The monitoring equipment was set up at the pond by Evan Sanderson, as described below. The NIWA Neon website was checked to confirm that data was being recorded and sent to the website.

3.1. Water Level Monitoring Unit

A laser distance measuring unit was set up vertically over the pond surface. A reflective disc was placed on the pond surface to ensure constant, repeatable readings.
The laser was set up within a PVC pipe which acts as a stilling well.

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Phone 03 215 4381, Fax 03 215 4391
Email: scandrettrural@xtra.co.nz

Distance readings to the pond surface were taken at 10 second time intervals and sent to NIWA's Neon logging system.

3.2. Meteorological Station

A Vaisala weather station orientated to the North was also set up and the data it collected sent to NIWA's Neon system at 10 second intervals. It measured:

- Air Temperature
- Wind speed
- Wind direction
- Rainfall

3.3 Evaporation Loss Monitoring

A 10 litre bucket (evaporation pan) with a diameter of 250mm was installed on the pond bank to measure evaporation. The bucket was rinsed and then accurately filled with 9 litres of effluent and the volume monitored to determine evaporation.

4. Results Recording

Recording of results was carried out to comply with the Appendix P of the Environment Southland Land and Water Plan, recording details are summarised below:

- The minimum test period has to be 48 hours.

- Readings are to be taken every 10 seconds.

- For maximum accuracy the wind velocity has to be less than 1.0m/sec. This limit has been set because wind at the test site has been observed to have two affects, the first being to cause waves and the second to push water to one side of the pond from the other, (a seiche effect). The accuracy of the laser distance recorder is such it will detect changes as small as 0.2mm. To accurately determine the true pond level requires calm conditions at the start and end of the test period.

- Rainfall and the evaporation bucket liquid volume was measured at the start and end of the test period, the measurement cylinder was rinsed prior to the volume being measured.
- When a period of 48 hours or more has elapsed the information is down loaded and the results interpreted.

- The GPS location of the pond and equipment setup is recorded. For this test the equipment was located at **E**1275936, **N**4858125, at the east bank.

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Phone 03 215 4381, Fax 03 215 4391
Email: scandrettrural@xtra.co.nz

Laser at the east bank.

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Phone 03 215 4381, Fax 03 215 4391
Email: scandrettrural@xtra.co.nz

5. Results Summary

The results for the test are summarised in Table 1 and discussed below.

The plot of wind speed and pond height shows that at times wind caused significant waves on the pond surface, particularly during the afternoon of the 8th.

However a period was identified at the start and end of the test period when the pond surface was stable and accurate height readings were established.

The start time was assumed to be at 18:22:00 hours on the 7 April 2017.
The distance from the laser to the reflective disc on the pond surface was 353.0mm and the wind speed 0.2m/sec.

The finish time was assumed to be at 07:57:00 hours on the 10 April 2017.
The distance reading was 356.6mm and the wind speed 0.4m/sec.

The total time elapsed was 61 hours and 35 minutes, 0 seconds.
The laser measured a change in distance to the pond surface of a 3.6mm increase. Therefore the pond surface fell 3.6mm over the test period.

The total rainfall recorded by the Vaisala rain sensor during the test period was 0.0mm.

The change in level in the evaporation bucket on site for the test period was calculated as 6.9mm decrease in level. The evaporation losses recorded at Invercargill were 5.4mm for the same time period. The evaporation bucket could not be placed in the pond for this test and so the evaporation results will be overstated relative to pond results.
The pond should have lost up to 6.9mm due to evaporation. The pond decreased by 3.6mm, 3.3mm less than the bucket evaporation recorded.

TABLE 1 : DROP TEST RESULTS SUMMARY, Firdale Ltd.

Start Time	7 April, 18:22:00
Finish Time	10 April, 07:57:00
Total Time	61hrs, 35 minutes, 0 seconds
Start height above surface (mm)	353.0
Finish height above surface (mm)	356.6
Change in depth (mm)	-3.6
Rainfall (mm)	+0.0
Evaporation (mm)	-6.9
Net Change in Depth After	
Rain and Evaporation (mm)	+3.3

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Email: scandrettrural@xtra.co.nz

Net Change per 24 Hours (mm)	+1.3
Pond Level, % of Design Depth	92
Net Change if Pond at 75% of	
Design Height. (mm/24hrs)	

6. Conclusion

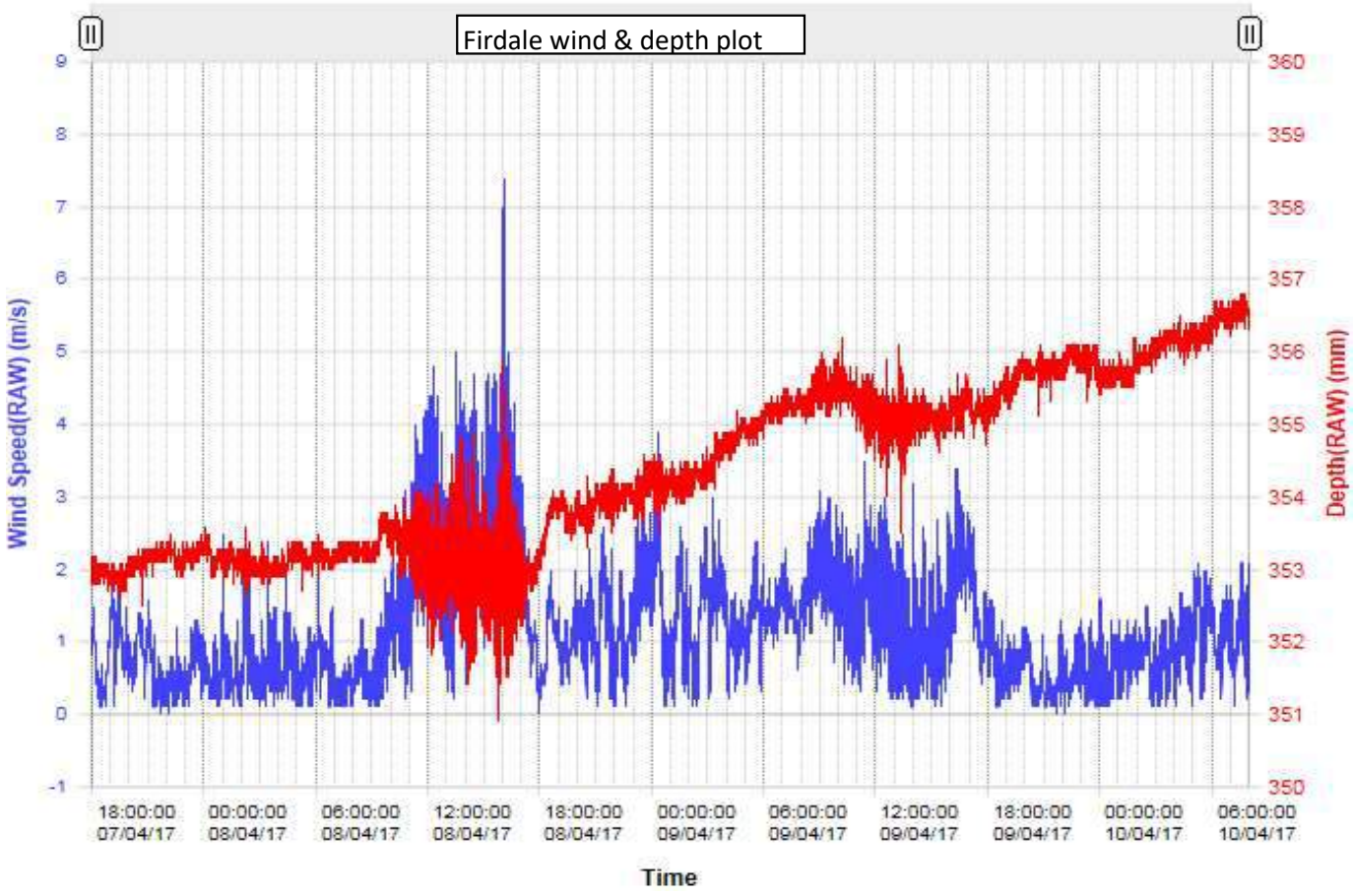
The decrease in pond level was less than the rate of evaporation recorded on site. This is not unexpected since the evaporation bucket was placed on the pond bank and could be expected to evaporate at a higher rate than the pond. The plot of pond height shows a reasonably consistent trend line of the pond surface decreasing over time.
Scala Penetrometer readings and auger holes were excavated to check the material and degree of compaction to a depth of 1.6m below ground level. Compaction increased with depth and no gleying was observed which would have indicated lateral effluent movement into the soil profile. There is nothing to suggest liquid would have flowed from the surrounding ground into the pond.
On this basis it can be stated the pond complies with the requirement of the Environment Southland Land and Water Regional Plan for effluent discharge (Rule 35 b. iii.2.), with a leakage rate of less than 2 mm /day.

Yours faithfully

JOHN SCANDRETT
Agricultural & Engineering Consultant

Appended
Depth and wind speed graph for the test period.
Rain and depth graph for the test period.
Depth and wind speed for the start of the test period.
Depth and wind speed for the end of the test period.

10 Kinloch Street, PO Box 5003, Waikiwi, Invercargill 9843
Phone 03 215 4381, Fax 03 215 4391
Email: scandrettrural@xtra.co.nz


Firdale wind & depth plot
Wind Speed(RAW) (m/s)
Depth(RAW) (mm)
9
8
7
6
5
4
3
2
1
0
-1
360
359
358
357
356
355
354
353
352
351
350
18:00:00 07/04/17
00:00:00 08/04/17
06:00:00 08/04/17
12:00:00 08/04/17
18:00:00 08/04/17
00:00:00 09/04/17
06:00:00 09/04/17
12:00:00 09/04/17
18:00:00 09/04/17
00:00:00 10/04/17
06:00:00 10/04/17
Time

Attachment E: Confirmation Letter from NIWA

1 June 2017

John Scandrett
Dairy Green Ltd.
10 Kinloch Street
PO Box 5003
Waikiwi
INVERCARGILL

RE: Firdale Drop Test, 7-10 April 2017

Dear John

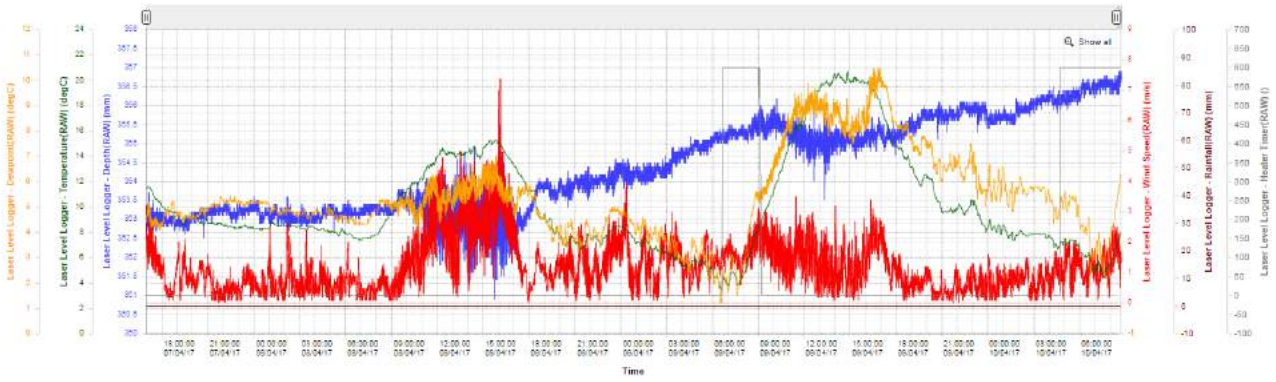
At your request we have reviewed the data collected for the above test, performed between 7 and 10 April 2017. From this review we can confirm that:

1. The raw data collected via our Neon data collection system is as you have stated.

2. Wind effects are evident on a couple of occasions in the middle of the test, and this manifests as noise on the level trace corresponding to wave action on the pond.

3. There is a reasonably consistent overall trend in the level trace supporting he recorded evaporation and the very slow leakage you calculated.

4. Subject to the above, the overall conclusions drawn in the report appear sound and reasonable.



Yours faithfully

Rod Mckay
Group Manager
NIWA Instrument Systems

Attachment F: Focus Activity Farm Plan

15 November 2016

environment SOUTHLAND
REGIONAL COUNCIL
Te Taiao Tonga

Ms Julie Clarke
87 McMillan Road
RD 2
Wyndham 9892

Our Reference: A297268
Enquiries to Sarah-Jane Luoni

Dear Julie

Focus Activity Farm Plan for Firdale Farms

Thank you for the opportunity to visit and carry out a Focus Activity Plan for your Firdale property.

The property as I understand it is:

- 246 ha largely self-contained dairy platform.
- cows are wintered in sheds and supplementary feed is sourced from the Fonterra waste water irrigation area
- legal description of the property is:
  - Part Lot 228 DP 107
  - Lot 1 DP 14493
  - Lot 3 DP 14491
  - Lot 1 DP 13586
  - Lot 2 DP 14491
  - Lot 1 DP 14494
  - Part Lot 1 DP 12023
  - Lot 227 DP 107
  - Lot 230 DP 107
- the entire property is land use inventory Class 2 with the primary slope class is < 4°

The enclosed plan generally contains maps and supporting advice and information that will provide farm specific advice on riparian management, nutrient management and winter grazing to you in a way that is straightforward and with clear priorities for action. However this property is the **ideal farm in the ideal location,** and consequently there are no issues to consider other than nutrient leaching.

This plan includes the following maps:

- Soils
- Physiographic Zones
- Waterways and critical source areas (riparian fencing/planting)
- Winter Grazing areas
- Cultivation areas
- Biodiversity

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Also included are factsheets on soil types, physiographic zones, critical source areas, riparian management, nutrient management, preparing for winter and farmers rough guide to Environment Southland's rules.

You'll be aware that there are requirements in the Proposed Southland Water and Land Plan to have a farm environment plan ("Appendix N plan"). This Focus Activity Farm Plan will require additional information to meet the requirements – see the box at the end of this letter for more information.

What's next?

I encourage you to undertake these actions over the coming year, and am happy to help provide further advice or assistance on these actions or Appendix N. I will come back and see how you are getting on with these actions, and plan to do so within two years.

Please feel free to contact Sarah-Jane Luoni on 0800 76 88 45 if you have any questions.

Yours sincerely

James Holloway
Holloway Environmental Services

Recommendation	Suggested Completion Date
Riparian Management Your farm has no watercourses of any nature on it. Therefore there are no riparian requirements.	
Nutrient Management The physiographic zone for your farm is Oxidising In the oxidising zone, nutrients and contaminants are lost to groundwater by deep drainage. The loss of nitrate is a particular concern in the oxidising zone as it can accumulate in the groundwater. You need to be especially vigilant that silage leachate does not discharge to ground. If wet silage is made the leachate can be collected and applied in a diluted form as fertiliser. There are factsheets in this tab that provide more information on the physiographic zones and relevant good management practices. **Obtain an Overseer® nutrient budget and develop a nutrient management plan.** We recommend that you talk to a Certified Nutrient Management Advisor (CNMA) who can prepare an Overseer® Nutrient Budget for you. The advisor will also be able to help you prepare a Nutrient Management Plan. Visit the following website for more information and to find out who is certified in the Southland and Otago regions. http://www.nmacertification.org.nz/Site/Nutrient_Management/Certified_Advisers/default.aspx An Overseer® nutrient budget will give you an explanation on how your nutrients will move around your farm. This information will benefit in terms of knowledge and environmental sustainability. It may also lead to further thinking and action on ways to reduce nutrient loss as nutrient stripping (i.e. constructed wetlands, sediment traps etc.) The plan is more involved than the nutrient budget, and looks more in depth at nutrient gains and losses and mitigation factors. Nutrients of particular concern include: **Nitrogen** Nitrogen cannot be held in the soil and so nitrogen that is not utilised by	Monitor silage to ensure no leachate is discharged from the stacks. Check your overseer budget to identify any losses that are able to be mitigated.

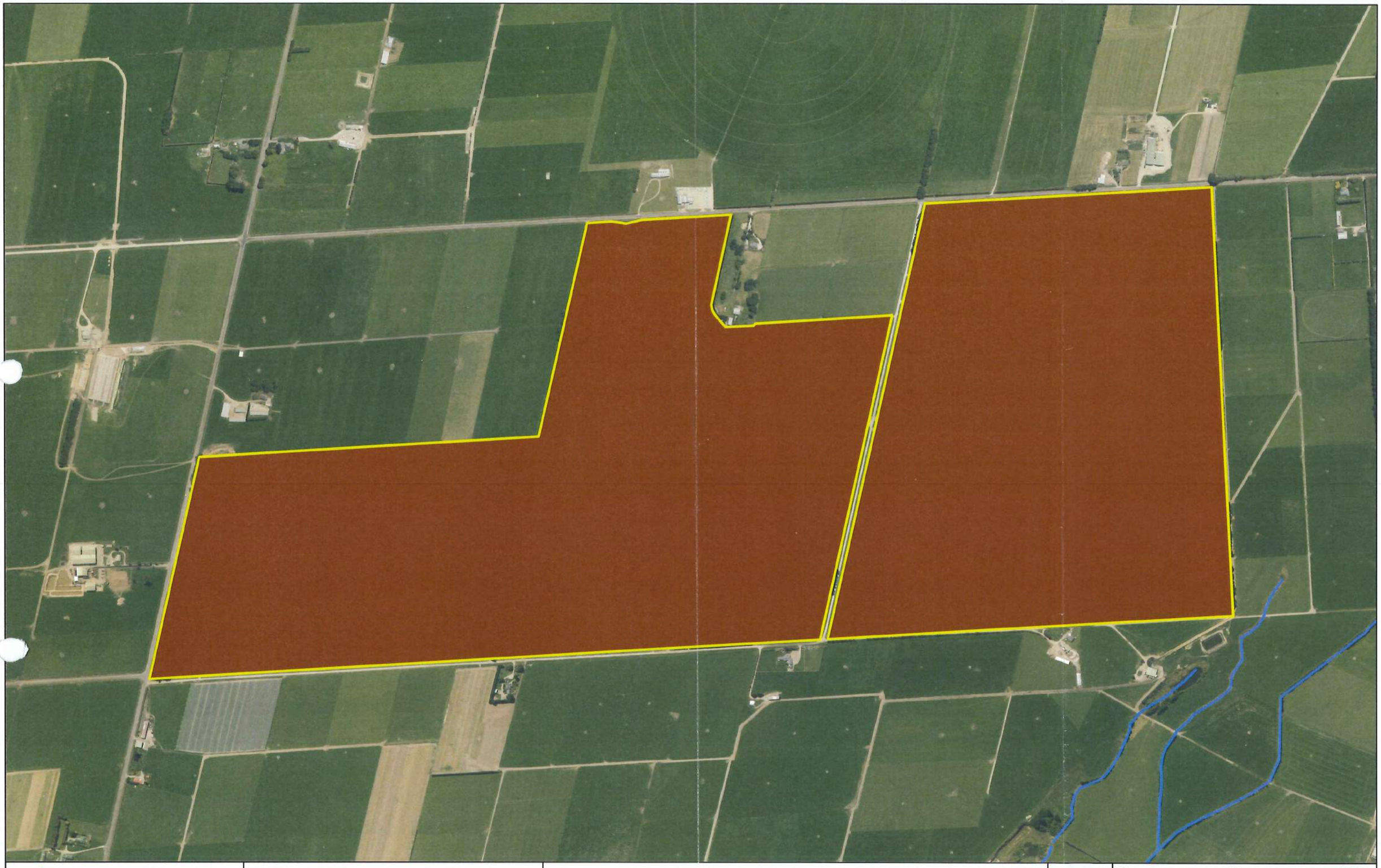
Recommendation	Suggested Completion Date
plants leaches below the root zone is lost to the environment. Large amounts of nitrogen can be lost from winter grazing heavy animals. It would help you to know what losses are occurring so these can be managed. **Phosphorus** Phosphorus is held very strongly to the soil particle, and generally the only way phosphorus is lost to the environment is by overland flow, with some from tile drain outfall. Phosphorus promotes weed growth in water ways and can also place layers of sediment on the bottom of water ways which is detrimental to in stream life. For more information go to the Nutrient Management tab.	
Winter Grazing and Cultivation The only soil on your farm is Edendale. This is a very versatile soil with few issues.. Where available a description of these soils is included in your folder under the Soils tab, sourced from the Topoclimate soils database. Current farm practices do not pose any issues for the property.	

Appendix N – Items to note:

The Proposed Southland Water and Land Plan has taken legal effect from June 2016. It is possible that there will be changes to the rules and requirements through the submission process which is expected to take place in mid-2017.

To comply with the current Appendix N requirements, you would need to add the following information to this Focus Activity Farm plan:

- ☐ Include the legal description of parcels of land within farm boundary;
- ☐ Include details of any resource consents (including related effluent management information);
- ☐ Note the location of significant infrastructure on an aerial photograph (eg. Shearing shed, dairy shed, effluent pond or silage stack);
- ☐ Choose relevant good management practices based on the physiographic zones for this farm (in addition to above recommendations) from the factsheets in the Nutrient Management tab of this folder;
- ☐ Undertake a 12 monthly review and note any progress on plan recommendations;
- ☐ Consider whether the Southland Land Drainage Act applies to any works that you are thinking of doing.



environment SOUTHLAND REGIONAL COUNCIL
Te Taiao Tonga

Firdale Farms Ltd: Soils Map - Wyndham Mimihau

Date: 14/11/2016

Land & Water Services Rivers

Edendale

N

1:9,000

0 0.3 0.6 Kms

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 reused in any manner without consultation.

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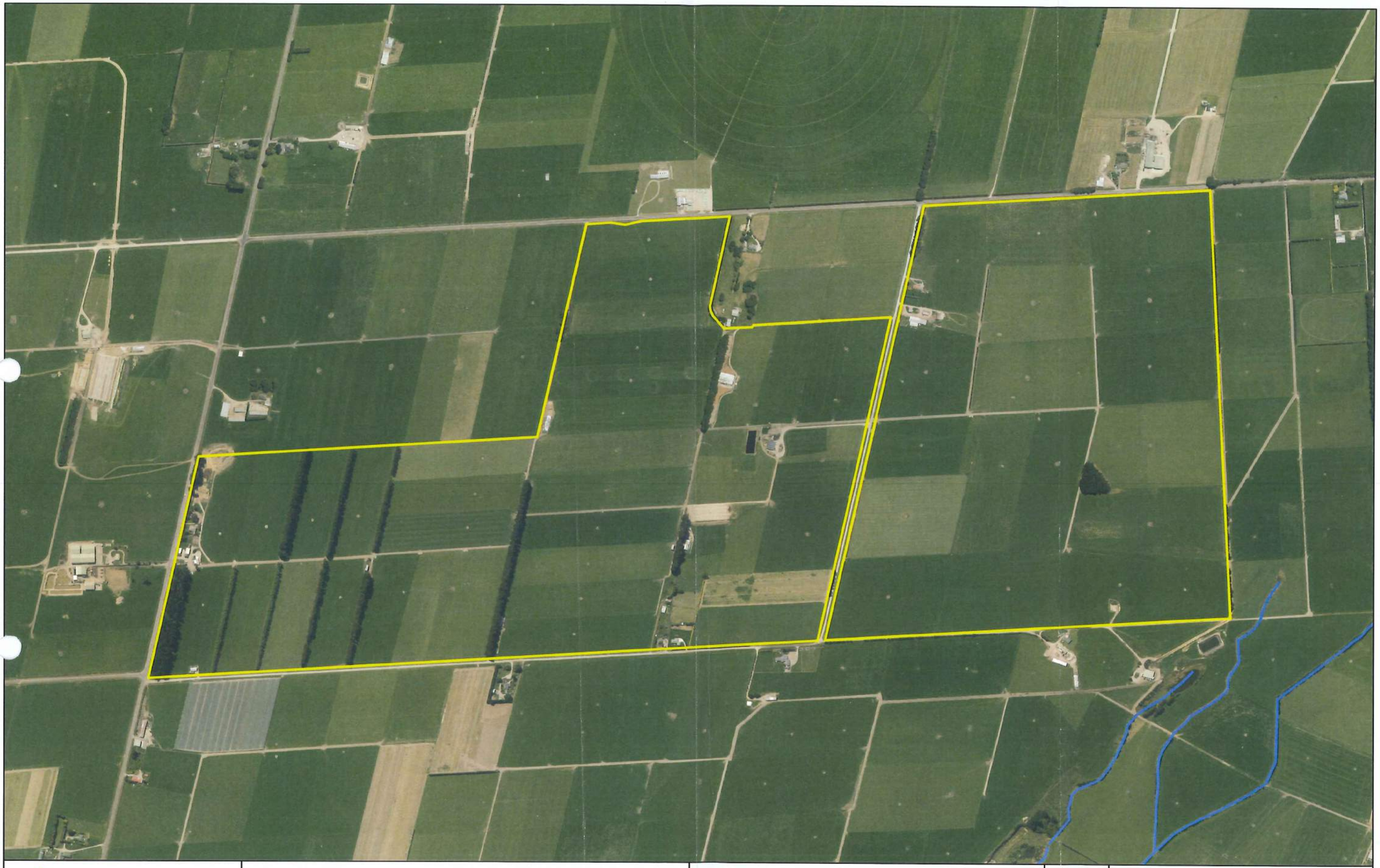

environment SOUTHLAND REGIONAL COUNCIL
Te Taiao Tonga

Firdale Farms Ltd: Riparian Fencelines and Planting - Wyndham Mimihau

Date: 14/11/2016

Farm Boundary

Waterways

N

1:9,000

0 0.3 0.6 Kms

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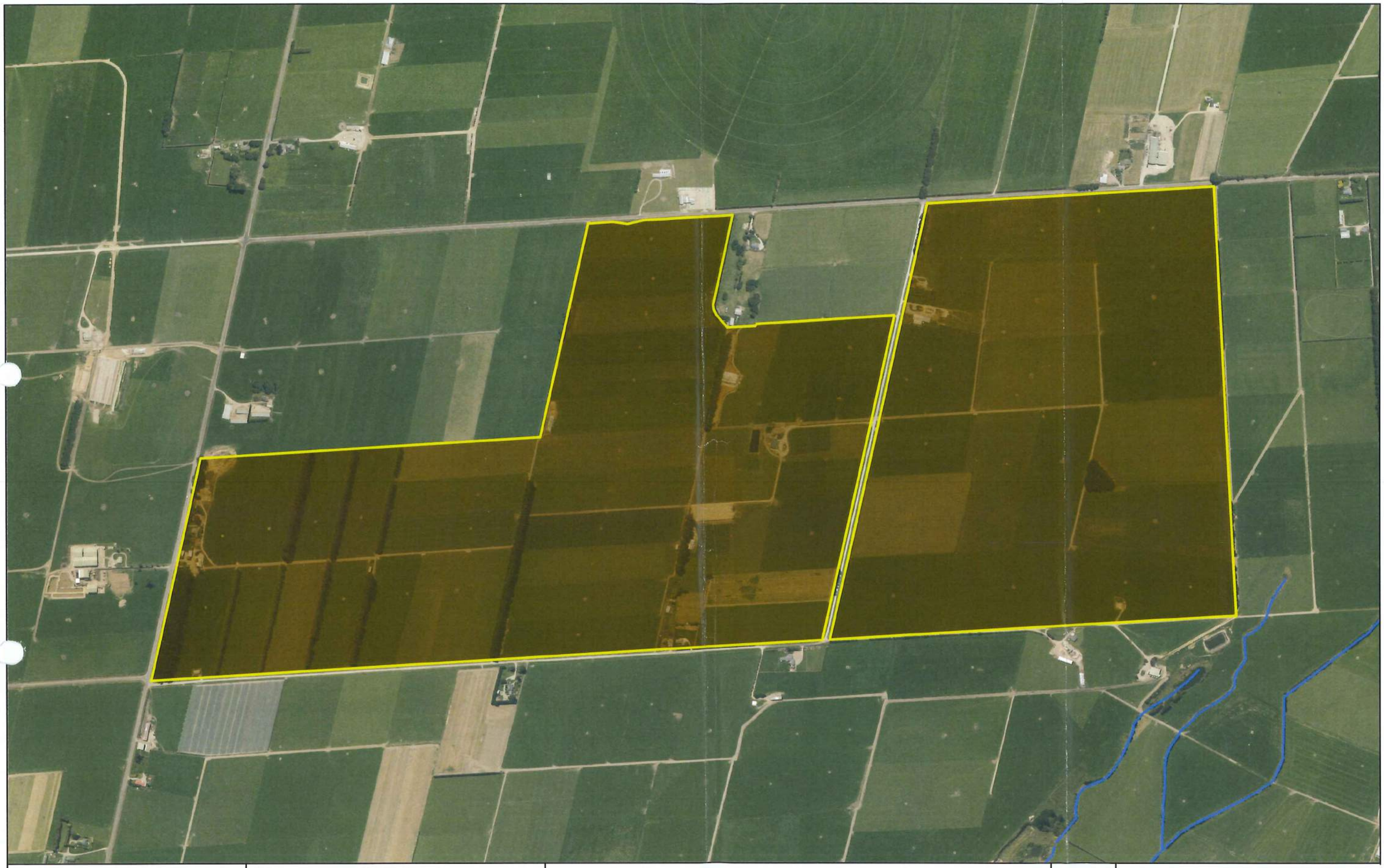

environment SOUTHLAND REGIONAL COUNCIL
Te Taiao Tonga

Firdale Farms Ltd:
Physiographics - Wyndham

Date: 14/11/2016

Farm Boundary
Oxidising - No Variant
Land & Water Services Water Bodies
Land & Water Services Rivers

N

1:9,000

0 0.3 0.6 Kms

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Firdale Farms Ltd: Cultivation Map - Wyndham Mimihau

Date: 14/11/2016

Waterways
Cultivation Polygon
Farm Boundary

N

1:9,000

0 0.3 0.6 Kms

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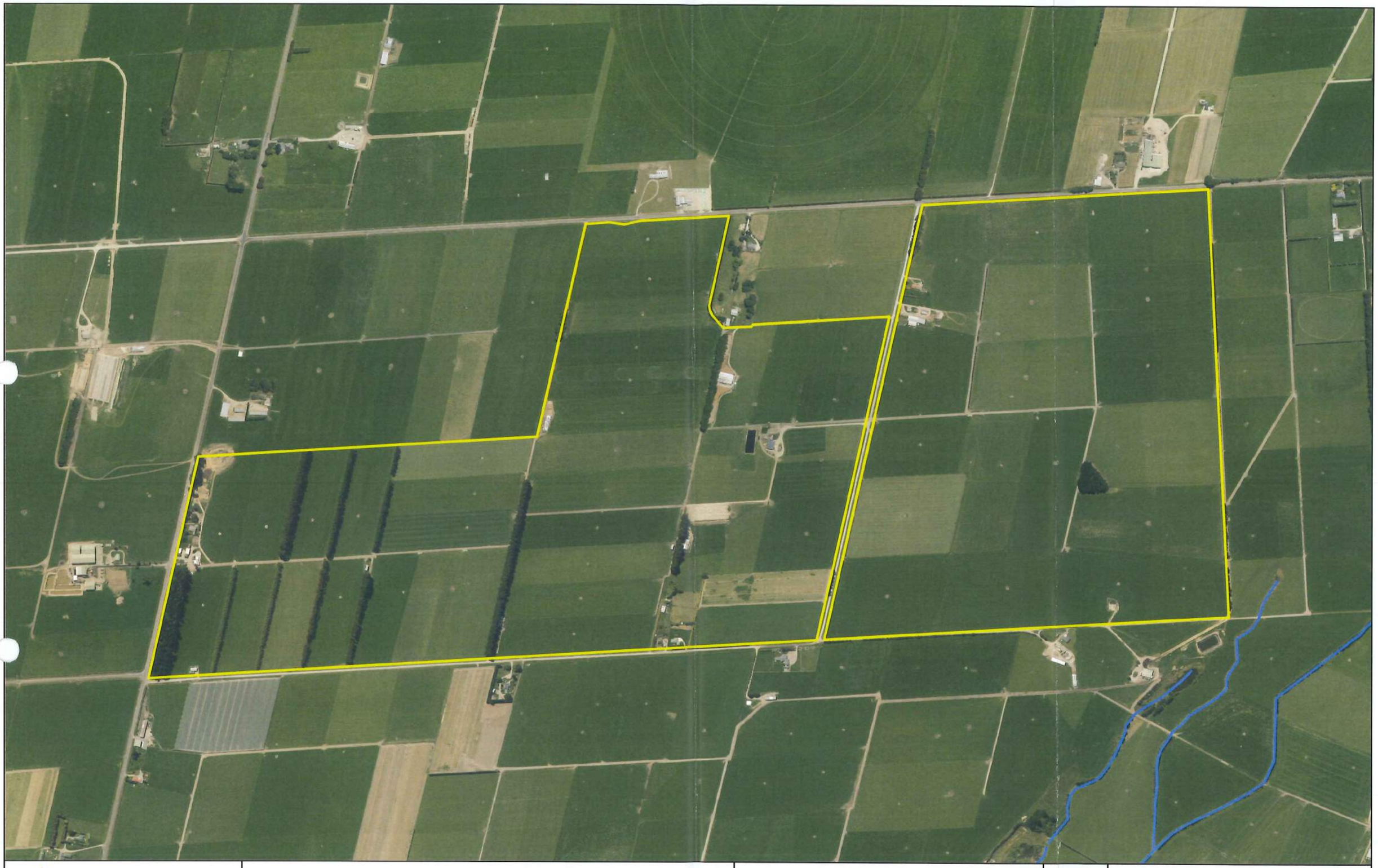

environment SOUTHLAND REGIONAL COUNCIL
Te Taiao Tonga

Firdale Farms Ltd: Winter Grazing Paddocks - Wyndham Mimihau

Date: 14/11/2016

Waterways

Farm Boundary

N

1:9,000

0 0.3 0.6 Kms

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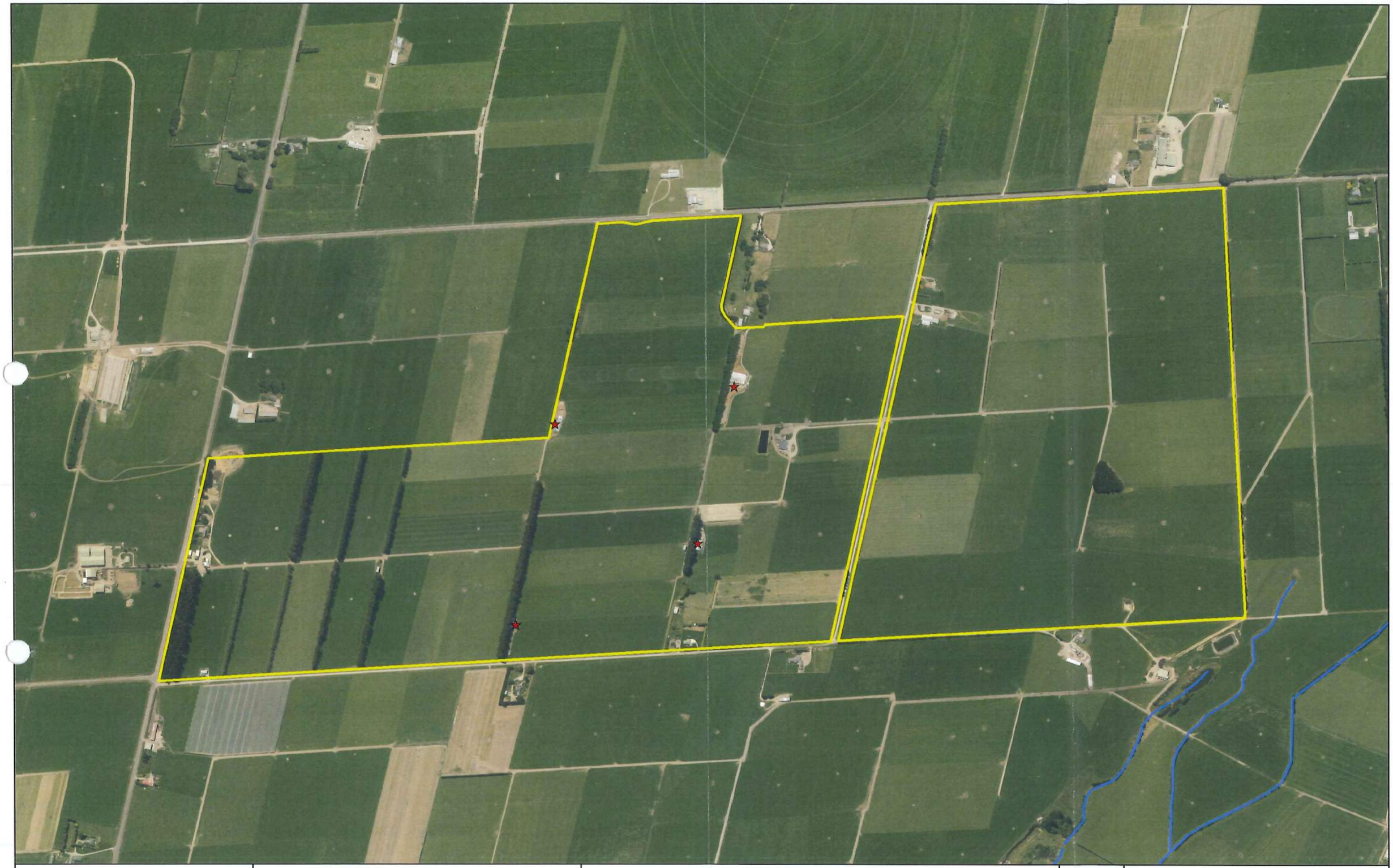

Firdale Farms Ltd: Biodiversity - Wyndham Mimihau

Date: 14/11/2016

★ Silage Pit

Land & Water Services Rivers

Farm Boundary

N

1:9,000

0 0.3 0.6 Kms

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