20 July 2022

Landpro Reference: 21169
Council Reference: RC220173

Central Otago District Council
1 Dunorling Street
Alexandra 9320

Dear Chris,

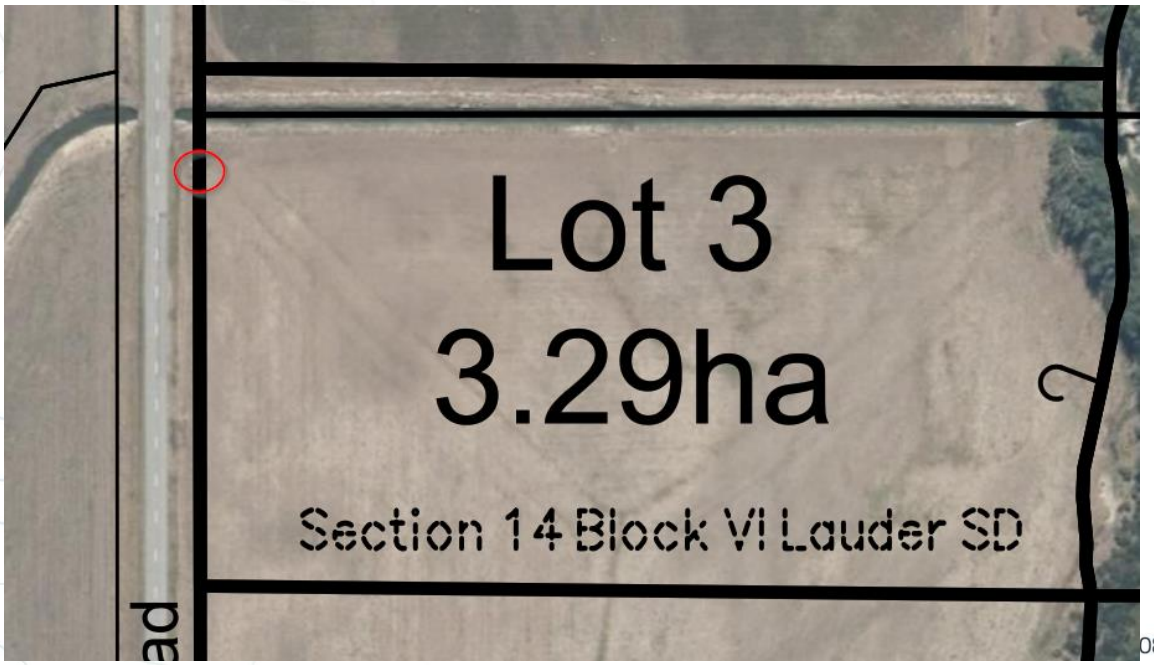
Re: Request for Further Information under Section 92(1) of the Resource Management Act 1991 – RC220173 Application - Mawhinney/Racecourse Road, Omakau Subdivision

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

1. Access

Lot 3 access

The location for the access to Lot 3 has not yet been determined. Racecourse Road is a straight road with suitable sightlines in both directions, and an accessway anywhere along the boundary with Racecourse Road will be suitable to provide for safe and efficient vehicle access. It is likely that the gateway for Lot 3 will utilise the existing farm gateway located south of the existing water race, as shown in the image below.



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Cromwell 9342
Central Otago, NZ
info@landpro.co.nz
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Lot 4 access

Lot 4 will be provided with access to Mawhinney Road via an access strip along the eastern boundary of Lot 2. A vehicle entranceway from Mawhinney Road to proposed Lot 4 will be constructed or upgraded in accordance with the requirements of Part 29 of Council's Roading Policies, January 2015. An updated scheme plan is attached as Appendix A.

2. Water Supply

In my experience, this matter is typically addressed at the Section 223/224 stage as part of the supply of services. A consent condition, such as that proposed below, is sufficient to address this matter as part of the resource consent stage:

A potable water supply of at least 1000 litres/day must be provided to the boundary or buildable area of Lots 1/2 and Lots 3/4 in accordance with Council's Addendum, Clause 6.3. Small Rural Water Supplies and other relevant provisions of NZS 4404:2004 and Council's July 2008 Addendum, with the following specific requirements:

> *i) Source water to be sampled and tested by a testing laboratory recognised by the Ministry of Health with bacteriological and chemical testing to the satisfaction of the Chief Executive.*
>
> *ii) Any non-compliance with Maximum Allowable Values (MAVs) and Guideline Values (GVs) under Drinking Water Standards for New Zealand 2005 (revised 2018) shall be highlighted in the Laboratory Report and an appropriate means of remedial treatment described. Any indicated requirement for water treatment to comply with MAVs at the source of the supply shall require installation and satisfactory testing prior to 224(c) certification.*
>
> *iii) A formal water supply document describing water supply and/or entitlement to Lots 1/2 and Lots 3/4 of at least 1000 litres/day.*
>
> *iv) If Lots 1/2 and Lots 3/4 are serviced for potable water by a network supply, evidence of the application to Taumata Arowai for network supply must be provided to the Chief Executive.*
>
> *v) If Lots 1/2 and Lots 3/4 are serviced for potable water by a network supply, a standard water connection to the boundary of Lots 1/2 and Lots 3/4 shall be installed including a standard valve and meter/restrictor assembly located at the boundary.*
>
> *vi) If Lots 1/2 and Lots 3/4 are serviced for potable water by a network supply, operation and management manual for the scheme including "as built" drawings shall be provided to the Chief Executive.*

vii) If Lots 1/2 and Lots 3/4 are serviced for potable water by a network supply, appropriate easements must be secured for the pipework and piped connections to the boundary of the allotment.

The supply of groundwater cannot be confirmed without constructing a bore and undertaking a pump test for the site. This is a cost-prohibitive and time-consuming exercise if it were to be undertaken solely as a means of confirming the reliability of a groundwater supply, prior to a resource consent being granted. Once the applicant has a resource consent, then this can be undertaken as part of the provision of services prior to section 223/224 certification.

Regardless, it is highly likely that there is a reliable groundwater supply. The Central Otago District Council are in the process of developing a groundwater abstraction on the applicant's property and have existing consents to do so (RM18.061.01 and RM19.231.01). Further to this, the site is located in the Manuherikia Groundwater Management Zone, which has over 22.4 million cubic metres of groundwater allocation available (as of 1 July 2022, as per Otago Regional Council's OtagoMaps database). As such, it can be assumed that there is a reliable groundwater source available to provide for Lots 1/2 and 3/4.

3. Sustainable use of the productive land and soil resource.

An assessment of the productive values of the site has been prepared and is attached as Appendix B.

Please feel free to get in contact with any further questions.

Kind Regards,

Brodie Costello
Planner

Appendix A – Updated scheme plan

SUBJECT TO RESOURCE CONSENT

1 DP 514263

Section 16 Block VI Lauder SD

Section 16 Block VI Lauder SD

Huddleston Road

Section 32
Block VI Lauder SD
RT OT 14B/1106

Lot 5
Section 15 Block VI Lauder SD
7.41ha

Omakau Area Irrigation Company Easement

Lot 6
32.76ha
Section 15 Block VI Lauder SD
RT OT 14B/1106

Lot 8
0.92ha
Section 15
Block VI Lauder SD

4263

Lot 3
3.29ha
Section 14 Block VI Lauder SD

Lot 4
0.796ha

Lot 9
3.33ha

Lot 7
28.98ha
Section 14 Block VI Lauder SD
RT OT14B/1114

Section 14
Block VI Lauder SD

Racecourse Road

Lot 1
3.29ha

Lot 2
0.741ha

SEE DIAGRAM A

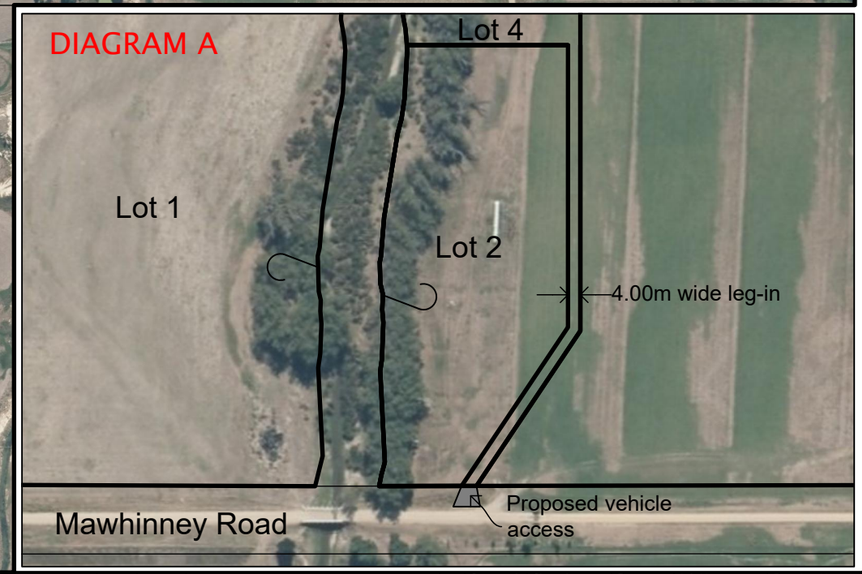
Lot 4 DP 491138

Mawhinney Road

Section 1 A Matakanui Settlement
Block III Lauder SD

Amalgamation Condition
"That Lots 1 & 2 hereon to be held in the same Record of Title"
and
"That Lots 3 & 4 hereon to be held in the same Record of Title"
and
"That Lots 5-9 hereon to be held in the same Record of Title"

DIAGRAM A



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Client: WILDON DAIRY LTD

NOTES
- All dimensions shown are in metres unless otherwise shown
- Copyright on this drawing is reserved
- Check any electronic data against the hardcopy plan to ensure it is the latest version
-If this plan is being used as part of sale and purchase agreement then it is done so on the basis that it is preliminary only, final dimensions and areas may vary on final survey

PROPOSED SUBDIVISION OF SECTIONS 14,15 AND 32 BLOCK VI LAUDER SD

Rev.	Date	Revision Details	By
A	7.10.21	lots rearranged, amalgamation condition chngd	SLB
B	28.10.21	Section 16 lots removed from the subdivision	SLB
C	17.2.22	2 small lots added	SLB
D	17.7.22	Lot 4 leg in added and access	SLB

Surveyed	Signed	Date	Job No.		Drawing No.
			21169		01 (2)
Drawn	Signed	Date	Scale		
SLB		10.9.21	1:2500.000 @ A1 #### @ A3		
Designed	Signed	Date	Datum & Level		Rev.
			LP2000		D

J:\21169 - Wildon Dairy Ltd - Potential Rural Subdivision Racecourse Road\CAD\21169_01_SCH_REV d.dwg Plotted: 17.07.2022

Appendix B – Productive land assessment

LANDPRO
Make the most of your land

7 July 2022

Landpro Reference: 21169
Council Reference: RC220173

Central Otago District Council
PO Box 122,
Alexandra 9340

To whom it may concern,

Re: Further information required for RC220173

Chris Pearse-Smith of 4Sight Consulting is processing a resource consent application on behalf of the Central Otago District Council (CODC), for Wildon Dairy Ltd's proposed subdivision and building platform at 71 Mawhinney Road, Omakau.

Chris has requested further information regarding the productive capacity of the site, specifically:

> *"Lots 1 and 3 have been identified by the applicant as suitable for sale as it is one of the least productive areas of the property, with this area containing a poor-quality, stony, and thin soil layer".*
>
> *Section 4.7.4(iii) of the Plan provides for a number of assessment matters including a consideration of the "Capability for sustainable use of the productive land and soil resource."*
>
> *Please provide further assessment from a suitably qualified person on the capability of the sustainable use of the productive land and soil resource.*

I consider myself to be a suitably qualified person to address these matters. I hold Bachelor of Science and Master of Science (1st Class Honours) degrees in earth and ocean sciences from the University of Waikato, where I majored in soil science and hydrology. I have completed post graduate papers in Sustainable Nutrient Management (intermediate and advanced) from Massey University. I have more than 10 years experience in environmental science, including working as a Nutrient Management Officer for 5 years and I am a member of the New Zealand Soil Science Society (NZSSS).

The soils in the area identified as suitable for subdivision (Figure 1) consist predominantly of the Patearoa soil (Pateg_5a.1) (Figure 2). This soil is a Typic Orthic Gley Soil which is a very shallow (0-20 cm) soil with a stony profile. The Patearoa soil is formed in alluvial sands, silts and gravels in a parent material of schist. It is generally poorly drained, has a high vulnerability to waterlogging in non-irrigated conditions and a high structural vulnerability (see S-Map factsheet, Patearoag_5a.1; attached).

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The New Zealand Land Use Classification, which is a tool that has been in use since the 1950s to help achieve sustainable development and management of land, records the area proposed to be subdivided as LUC 4s9 + 3c3 (Figure 3). This indicates that the land has moderate (3) to severe (4) limitations for arable use, with the major limitations being soil (s) and climate (c). The soil limitations in the area proposed for subdivision (Lots 1, 2, 3 and 4, Figure 1) relate to the shallow, stony nature of the soil, as well as the likelihood of subsurface pans. Soils with a schist parent material also often have high phosphate levels from mica minerals (Aston, 1923). The LUC unit, '9' in LUC class 4s9 indicates that the soil limitation is very difficult to manage or overcome.

In addition to the soil limitation within the proposed subdivision area, Orbell (1974) reported that a moisture deficit also limits plant growth throughout most of the mid Manuherikia district, where the mean annual rainfall is 439 mm (as recorded in Lauder, Macara, 2015). This evidence supports the 'c' or climate limitation of the productive capability of the Omakau area.

Conserving our soil resources in New Zealand is of particular concern. With that said, the Patearoa soil is unsuitable for arable uses, is marginal for horticulture, and although it does have productive capacity for pastoral land under irrigation, the soil is a Gley soil prone to waterlogging, and is separated from the balance of the farm by a stream which would make irrigation and pastoral farming more difficult.

Figure 1. Planned subdivision of Lots 1, 2, 3 and 4 in the southwest corner from the remainder of the property farmed by Wildon Dairy Ltd between Racecourse Road and Mawhinney Road, near Omakau.

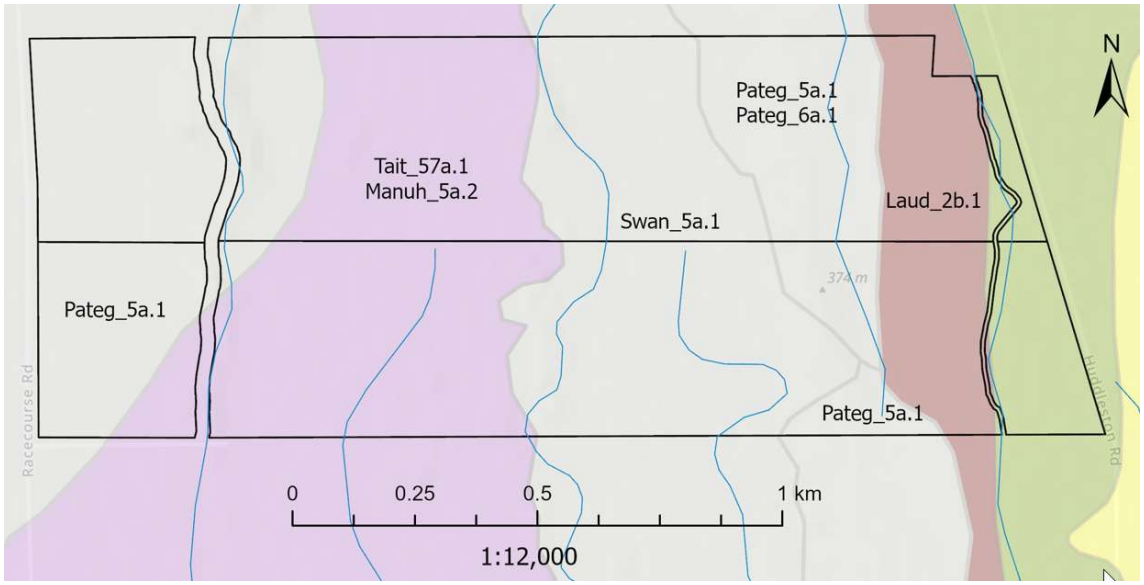


Figure 2. Soils of the area between Racecourse Road and Huddleston Road, north of Mawhinney Road, Omakau (S-map soil siblings, S-map data from Manaaki Whenua (2019)).

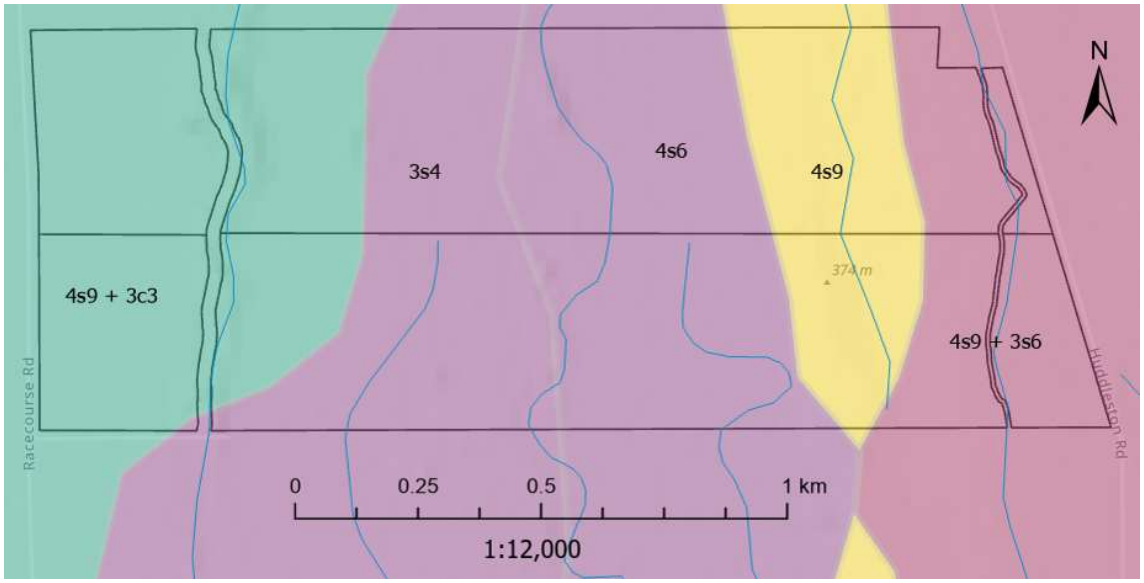


Figure 3. NZ Landuse capability classifications for the area between Racecourse Road and Huddleston Road, north of Mawhinney Road, Omakau. (Note: this data was developed at a scale of 1:63,360; LRIS portal, 2021).

Kind Regards

Natalie North
Environmental Scientist & Geospatial Technician

References:

Aston, B. C. 1923: Studies in New Zealand soils. The mica-schist silts. N.Z. Journal of Agriculture 26: 329-33.

LRIS portal (2021). NZLRI Land Use Capability 2021. https://lris.scinfo.org.nz/layer/48076-nzlri-land-use-capability-2021/)

Macara, G. R. (2015). The climate and weather of Otago. NIWA Science and Technology Series No. 67. https://niwa.co.nz/sites/niwa.co.nz/files/Otago%20Climate%20book%20WEB%202021.pdf

Manaaki Whenua (2019). S-map. https://smap.landcareresearch.co.nz/maps-and-tools/app/

Orbell, G.E. (1974) Soils and land use of mid Manuherikia Valley, Central Otago, New Zealand. Soil Bureau Bulletin no. 36. New Zealand Department of Scientific and Industrial Research: Wellington, NZ.

Manaaki Whenua
Landcare Research

S O I L R E P O R T

Otago Regional Council

Patearoag_5a.1

Report generated: 29-Jun-2022 from https://smap.landcareresearch.co.nz

Pateg_5a.1 (100% of the mapunit at location (1332471, 5007708), Confidence: Low)

This information sheet describes the typical average properties of the specified soil to a depth of 1 metre, and should not be the primary source of data when making land use decisions on individual farms and paddocks. S-map correlates soils across New Zealand. Both the old soil name and the new correlated (soil family) name are listed below.

Capture of the base soil information in this region was funded by Otago Regional Council, Fertiliser Association, Dunedin Rural Development and MWLR.

Soil Classification

Soil Classification:
Typic Orthic Gley Soils (GOT)

Family Name:
Patearoag (Pateg)

Sibling Name:
Patearoag_5a.1 (Pateg_5a.1)

Soil profile material
Rounded stony soil

Depth class (diggability)
Very shallow (0 - 20 cm)

Profile texture
silt

Parent Material

Stones/rocks
schist rock

Soil material
schist rock

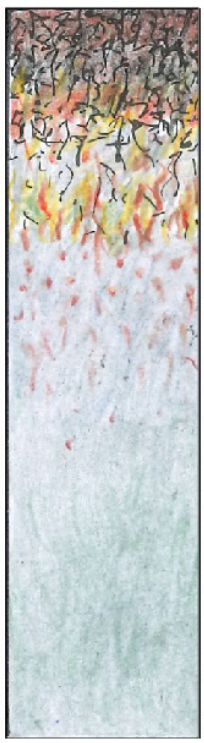
Origin
Alluvium

Soil Sibling Concept

This soil belongs to the Gley soil order of the New Zealand soil classification. Gley soils are strongly affected by waterlogging, have been chemically reduced, have light grey subsoils, and usually have reddish brown or brown mottles. Waterlogging occurs in winter and spring, and some soils remain wet all year. It is formed in alluvial sand silt or gravel deposited by running water, from schist parent material.

The topsoil typically has silt texture and is moderately stony. The subsoil has dominantly silt textures, with a very gravelly layer from less than 45 cm mineral soil depth to more than 100 cm. The plant rooting depth extends beyond 1m.

Generally the soil is poorly drained with high vulnerability of water logging in non-irrigated conditions, and has moderate to high soil water holding capacity. Inherently these soils have a high structural vulnerability and a very low N leaching potential, which should be accounted for when making land management decisions.



Allan Hewitt ©

Orthic Gley

About this publication

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

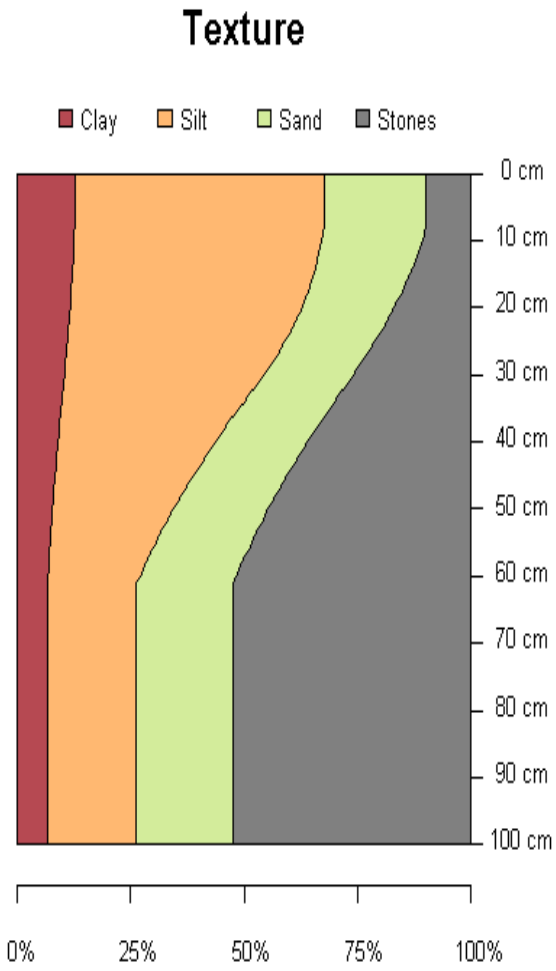
Patearoag_5a.1

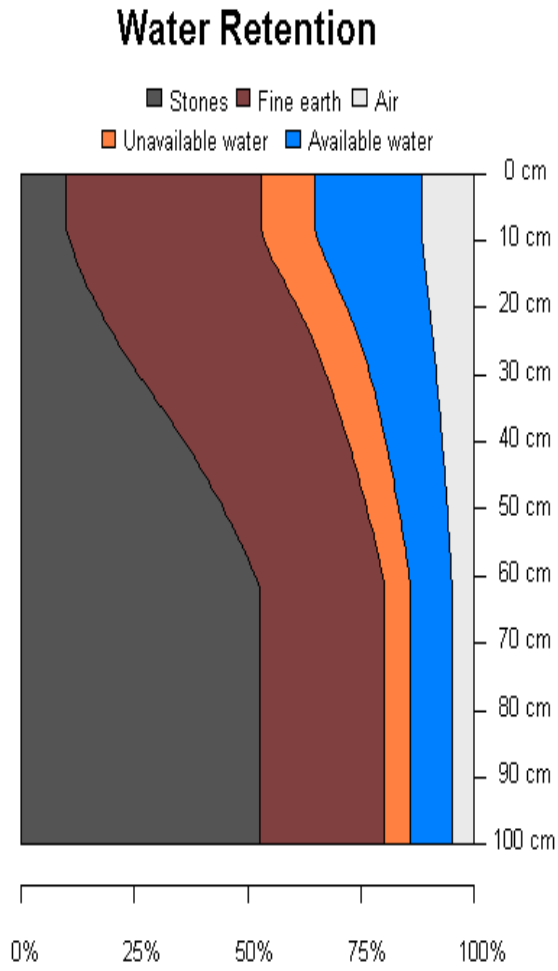
Soil horizons

Characteristics of functional horizons in order from top to base of profile:

Functional Horizon	Thickness	Stones	Clay*	Sand*	Permeability
Stony Loamy Weak	10 - 20 cm	5 - 15 %	8 - 20 %	10 - 40 %	rapid
Stony Loamy Weak	10 - 25 cm	5 - 35 %	8 - 20 %	10 - 40 %	moderate
Very Stony Loamy Compact	55 - 80 cm	35 - 70 %	8 - 20 %	30 - 60 %	moderately slow

* clay and sand percent values are for the mineral fines (excludes stones). Silt = 100 - (clay + sand)





The values for the graphs above have been generated from horizon and pedotransfer data. These values have then been splined to create continuous estimates of soil water holding capacity and particle size distribution the soil profile. These curves express the particle size distribution and water retention of the soil however there may be barriers to rooting depth that are not necessarily represented in these properties directly. It is advisable to check the potential rooting depth and rooting barrier fields in the soil physical properties section on page three of this factsheet.

Patearoag_5a.1

Soil physical properties

Depth class (diggability)
Very shallow (0 - 20 cm)

Potential rooting depth
Unlimited

Rooting barrier
No significant barrier within 1 m

Depth to hard rock
No hard rock within 1 m

Depth to soft rock
No soft rock within 1 m

Depth to stony layer class
Shallow

Texture profile
Silt

Topsoil stoniness
Moderately stony

Topsoil clay range
8 - 20 %

Drainage class
Poorly drained

Permeability profile
Moderate

Depth to slowly permeable horizon
No slowly permeable horizon

Permeability of slowest horizon
Moderate (4 - 72 mm/h)

Aeration in root zone
Limited

Profile available water

(0 - 30cm or root barrier)	(0 - 60cm or root barrier)	(0 - 100cm or root barrier)
High (62 mm)	High (98 mm)	Moderate to high (142 mm)

Dry bulk density

topsoil	subsoil
0.94 g/cm³	1.22 g/cm³

Soil chemical properties

Topsoil P retention
Medium (38%)

Soil management factors

Vulnerability classes relate to soil properties only and do not take into account climate or management

Soil structure integrity

Structural vulnerability
High (0.69)

Pugging vulnerability
not available yet

Septic tank installation category
A1 if slope > 15 deg otherwise A2

Contaminant management

N leaching vulnerability
Very low

P leaching vulnerability
not available yet

Dairy effluent (FDE) risk category
B

Water management

Water logging vulnerability
High

Drought vulnerability - if not irrigated
Low

Bypass flow
High

Hydrological soil group
C/D

Relative Runoff Potential

Slope	0-3°	4-7°	8-15°	16-25°	>25°
Risk	L	M	M	M	H

SINDI - Soil quality Indicators

SINDI - Soil Quality Indicators

A suite of soil quality indicators is available from http://sindi.landcareresearch.co.nz/

- Compare your soil with information from our soils databases.
- Assess the intrinsic resources and biological, chemical and physical quality of your soil
- See how your soil measures up against current understanding of optimal values.
- Learn about the effect each indicator has on soil quality and some general management practices that could be implemented to improve soil quality.

Patearoag_5a.1

Soil information for OVERSEER

The following information can be entered in the OVERSEER® Nutrient Budget model. This information is derived from the S-map soil properties which are matched to the most appropriate OVERSEER categories. Please read the notes below for further information.

Soil description page

1. Select **Link to S-map**
2. Under S-map sibling data enter the S-map name/ref: **Pateg_5a.1**

Considerations when using Smap soil properties in OVERSEER

- The soil water values are estimated using a regression model based on soil order, parent rock, soil functional horizon information (stone content, soil density class), as well as texture (field estimates of sand, silt and clay percentages). The model is based on laboratory - measured water content data held in the National Soils Database and other Manaaki Whenua datasets. Most of this data comes from soils under long-term pasture and may vary from land under arable use, irrigation, etc.

- Each value is an estimate of the water content of the whole soil within the target depth range or to the depth of the root barrier (if this occurs above the base of the target depth). Where soil layers contain stones, the soil water content has been decreased according to the stone content.

- S-map only contains information on soils to a depth of 100 cm. The soil water estimates in the > 60 cm depth category assume that the bottom functional horizon that extends to 100 cm, continues down to a depth of 150cm. Where it is known by the user that there is an impermeable layer or non-fractured bedrock between 100 and 150 cm, this depth should be entered into OVERSEER. Where there is a change in the soil profile characteristics below 100 cm, the user should be aware that the values provided on this factsheet for the > 60 cm depth category will not reflect this change. For example, the presence of gravels at 120 cm would usually result in lower soil water estimates in the > 60 cm depth category. Note though that this assumption only impacts on a cropping block, as OVERSEER uses soil data from just the top 60 cm in pastoral blocks.

- OVERSEER requires the soil water values to be non-zero integers (even though zero is a valid value below a root barrier), and the wilting point value must be less than the field capacity value which must be less than the saturation value. The S-map water content estimates supplied by the S-map web service have been rounded to integers and may be assigned minimal values to meet these OVERSEER requirements. These modifications will result in a slightly less accurate estimate of Available Water to 60 cm (labelled PAW in OVERSEER) than that provided on the first page of this factsheet, but this is not expected to lead to any significant difference in outputs from OVERSEER .