

APPENDIX 8

Agriculture Suitability Report



Independent
Agriculture
& Horticulture
Consultant
Network

Report

Prepared for Singleton Heritage Trust

Prepared by Dave Miller
18 December 2018

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1.0 Executive Summary

The Singleton's have bought a golf course back in June 2015. This has had modest fertiliser applications, no stock and no feed exported, and pastures have been controlled by mowing. This has created a very low Nitrogen Reference Point for the property.

The purpose of Plan Change 1 is to put a sinking lid on N leaching from the Western Waikato catchment. While an individual is entitled to apply for a resource consent to change their land use to one that demonstrates a high N leaching profile, the council has signalled that these are very unlikely to succeed.

The two most likely alternative land uses on a small block such as this would either be commercial maize production or commercial heifer grazing.

Overseer files have been done to understand the N leaching profiles of these two enterprises. Both show an 80% increase in N leaching per hectare relative to the N reference years. An increase of N leaching of this magnitude would simply not be tolerated by the Regional Council.

The second consideration, putting aside the obstacle of Plan Change 1, there are some commercial realities. If the property were to be farmed in its existing configuration there would only be an estimated 23 hectares of pastoral land available for heifer grazing. This would require an estimated capital expenditure of \$260,000 to fence and water. This enterprise would generate a gross return of approximately \$53,000 before rates, fertiliser, animal health or labour costs.

As a maize block the area planted is likely to be limited to 15 hectares. Given the extensive tree lines and the reluctance of contractors to plant too close to those trees to avoid damaging maize harvesters at harvest time. The net returns from the maize enterprise would be estimated at \$29,000.

To clear the land and remove the stumps to provide 40 hectares of usable land, I estimate costs for this to be approaching \$400,000. This would then provide 40 hectares that would need capital fertiliser for either a maize enterprise or grazing enterprise, and then further fencing and water installation for a grazing enterprise.

Plan Change 1 is the overarching determinant that is going to prohibit land use change on this property. However, even if that was not in effect, I could not advise a client to purchase this property for the purposes of establishing a commercially viable farming enterprise.

The soil types provide significant obstacles to profitable farming practices and the land development costs to remove the trees and establish a reasonably sized farming block would be prohibitive.

2.0 Background

635 Whatawhata Road is an approximately 46-hectare block that had been run as a commercial golf course for many years. The property has approximately 6.7 kilometres of well-established tree lines that provided the outline for the fairways throughout the property.

There are two primary soil types present - a deep and poorly drained clay soil and a deep and very poorly drained peat soil. S-Maps indicate approximately 72% of the property are of the poorly drained clays, with the remaining 28% being poorly drained peat.

There is no historic information available prior to June 2015 regarding any management practices, including fertiliser. Given its previous purpose was as a golf course there have been no stock involved and no cropping.

The current layout of the property is reflective of its previous life as a golf course. A series of long narrow grassed areas separated by rows of mature trees. The largest of these grass areas is approximately 1.3 hectares. It is 130 metres wide at its widest point. The majority of the grassed areas are approximately 40 metres wide.

The trees on the property are a mixture of pines, exotics and some more recent native plantings. They are well established with many trees approximately 20 metres tall. The property has a parklike appearance with a number of wetlands and ponds established.

The current proposal is to further enhance the parklike setting and establish several residential sites on the property. This proposal currently falls outside the District Council subdivision rules.

The purpose of this report was to examine the feasibility of returning a non-productive golf course into productive agricultural land.

Figure 1 is a screen shot from google earth showing the extensive treelines on the property.

Figure 1: Image of 635 Whatawhata Road



3.0 Farming activities since June 2015

At no time since the Singleton's purchased the property have there been livestock grazing on it. In December 2015 there was approximately 20 hectares of sorghum planted with the expectation of establishing a crop that could be commercially established and sold. Due to the low soil fertility, the difficult soils and the summer that occurred in 2015/16 this crop failed to establish properly, and there were only 40 bales sold from the estimated 20 hectares that ended up being planted in sorghum.

Subsequent to that, the area was re-established in pasture with a modest number of wrapped bales silage being sold each year or pastures simply mown to maintain control. Growth rates have been modest due to the limited fertiliser history.

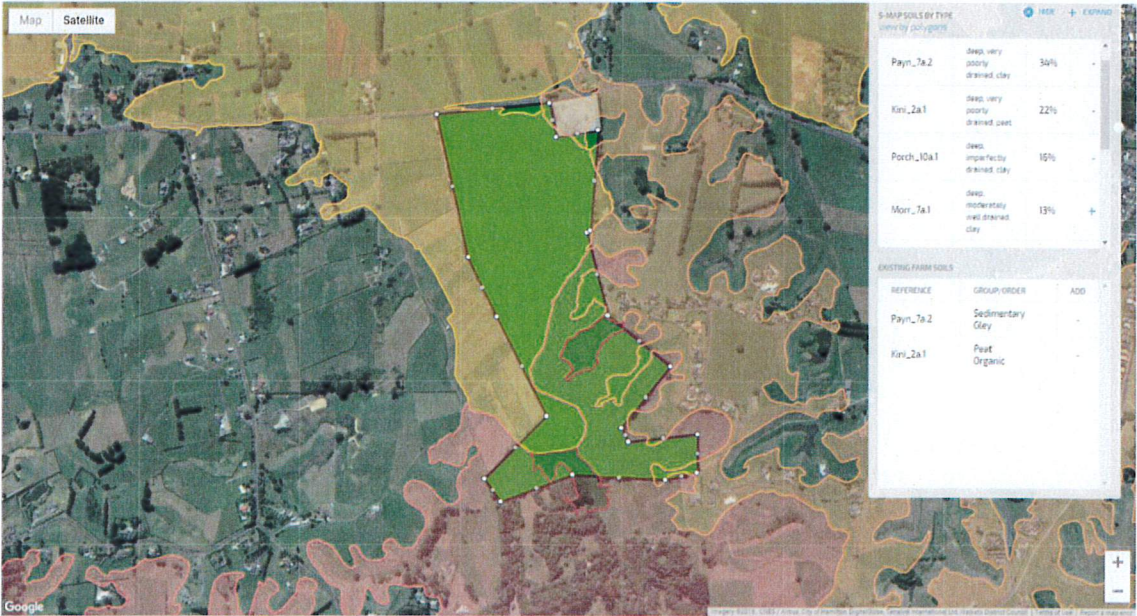
Having inspected the property I am of the view that one of the contributing factors to the failed sorghum crop was the extensive network of well-established trees whose roots would have encroached into the long narrow cropped areas, and I suspect out-competed the sorghum for moisture.

4.0 Soils

S-Maps was used to gain an understanding of the soil types.

Figures 1 shows the outline of the property and the recorded soil types. Overseer only allows 3 soil types per block, so I have adjusted the percentages of the 3 named soil types to reflect the overall mix 2 and 3 are summaries of the primary soil classes as indicated by S-Maps. The key feature is the recognition of the poorly drained nature of both the peat and the clay soils.

Figure 2:

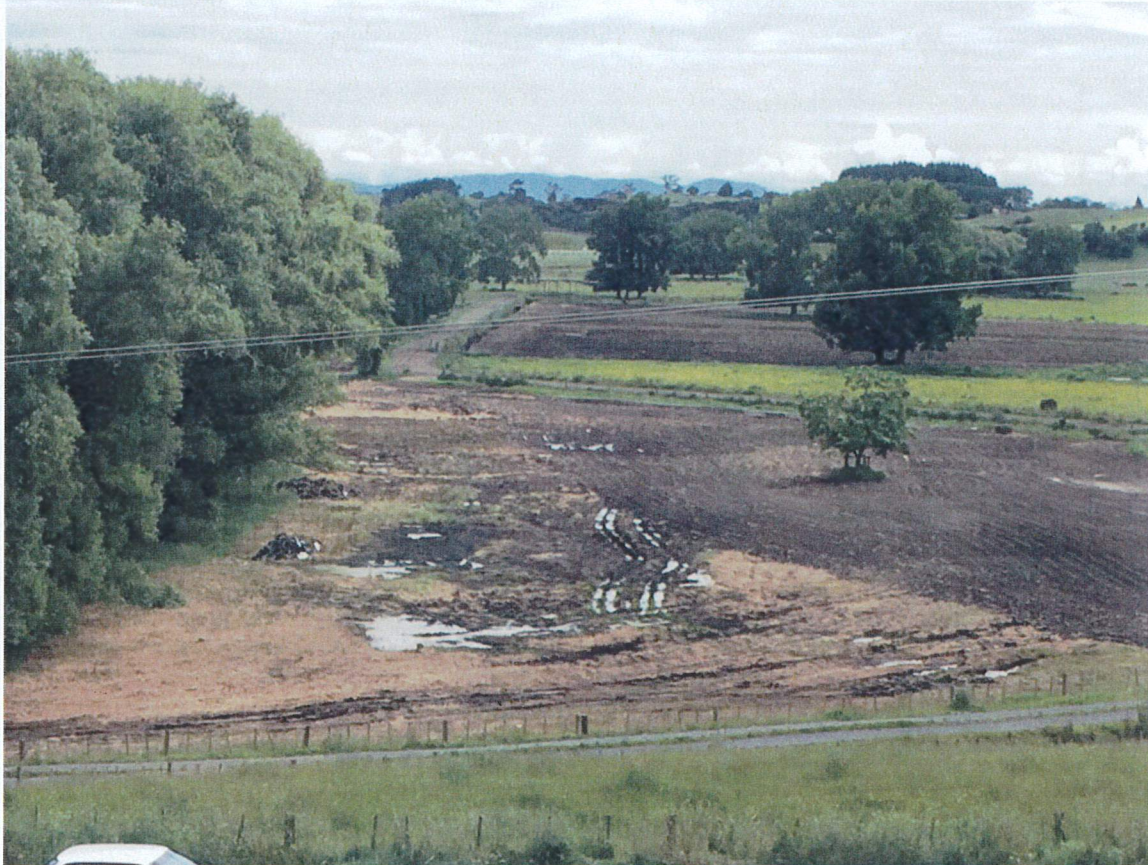


Full descriptions of each of the soils is provided in the appendices.

My visit was conducted in late November and the soils and areas of the property were saturated.

Photo 1 is taken from the northern boundary of the property looking across SH23 neighbouring farm. Photo was taken on 29th Nov. The purpose of this photo is to illustrate the challenges of cultivation on these peat soil. Approximately 1/3 of the paddock couldn't be planted due to saturated conditions. S -Maps indicates that it is the same peat soil at 635 Whatawhata road

Photo 1:



While these soils are used for agricultural purposes, they do have limitations. From a livestock production perspective they are prone to pugging and compaction. From a cropping perspective the poor drainage means that these soils tend to be cultivated later in the season resulting in a shorter growing season, and lower yields of crops such as maize relative to higher class soils in the Waikato region.

5.0 Physical configuration of the property

The property has been a commercial golf course for many years. Approximately 6.7 kilometres of trees were established many years ago to provide the framework for the course layout. This has resulted in long narrow fairways bordered by large trees. This is clearly shown in Figure 1.

Photo 2: Example of trees on the property



Photo 3: Example of the size of the larger trees



The current configuration results in a series of grassed areas, the largest of which is 1.3 hectares, however these are generally very long and narrow in nature. Typically, they are only 40 metres wide and up to 300 metres long.

Given the poorly draining nature of both the clay and peat soils there are a number of open drains running through the property. In several places these have been enhanced through the formation of ponds and wetlands that assist in minimising overland loss of soil, nutrients and bacteria into the larger water ways into which the drains flow.

The two photos below give an indication of the wetland enhancement that has been undertaken.



6.0 Development costs

As it stands there is approximately 23 hectares of mown grass on the property. The current layout makes it impractical to farm in a conventional manner.

If the regional council would grant a resource consent that allowed this land to be returned to agricultural production, then the development costs would be substantial.

The following costs are indicative in terms.

To turn this property into a productive agricultural block would be prohibitively expensive. If the existing tree framework is to be retained I estimate that there is approximately 25 kilometres of fencing required to establish an estimated 23 hectares of grazeable land.

The cost of establishing a five-wire fence is estimated at between \$6.00 and \$8.00 per metre, which would give a completed fencing cost of approximately \$200,000.

In addition to the fencing a water scheme would be required. Given the current complexity of the property layout and looking to establish approximately 18 paddocks, I have estimated the cost of establishing a suitable water scheme at \$65,000.

Both the fencing costs and water reticulation costs are estimates only and should not be relied upon for budgeting purposes.

This land would have the potential to graze approximately 150 dairy heifers.

7.0 Maize

The other commercial enterprise that may be considered would be maize production for sale.

While there are an estimated 22 hectares available for planting, I estimate that a contractor would only plant approximately 15 - 18 hectares to ensure there is a reasonable distance left between the tree lines and where the choppers would go at harvest.

The growing costs are estimated at \$0.14/kgDM. The sale price would be in the order of \$0.25/kgDM. On an estimated 15 hectares planted this would be a net income of \$29,700 p.a.

The alternative would be to clear the trees to provide a more workable block. Given that few of the trees have any commercial value at harvest there is unlikely to be any cost recovery in the harvesting of the trees.

There is a stand of old man pine trees of approximately 0.35 hectares. These have started shedding branches and for a health and safety perspective are very likely to be felled. A quote has been provided to fell and clear these at \$15,000.

Apart from this there have been no other quotes sought to determine the cost of clearing the site, however given the extensive nature I do believe that it would be in the vicinity of \$200,000.

On top of this there would be further expense required for root raking and stump removal.

8.0 Plan Change 1

The biggest obstacle to changing the land use on this property is Plan Change 1 as put forward by the Waikato Regional Council. This plan was notified in October 2016, and while there is a submission and hearing process to be undertaken the rules apply as they are currently written.

In summary, Plan Change 1 requires landowners to use Overseer to establish a Nitrogen Reference Point for the 2014/15 and 2015/16 years. The landowner is entitled to use whichever Nitrogen Reference Point from those two seasons that they see fit.

The full details of Plan Change 1 are available on the Waikato Regional Council website. In practice, for farms that are in the lower three-quarters in terms of nitrogen leaching per hectare in the two reference years, they are entitled to continue operating as they are as long as their farming practice does not change in a way that increases the N leaching above those nitrogen reference years. For the top quartile of N leaching farms they must undertake a process that will modify their farming system to bring their N leaching down to the 75th percentile.

I have developed a series of Overseer files to understand the likely N reference points in the 2014/15 and 2015/16 years, and then have run two further models to understand the N leaching from both a maize cropping enterprise and a heifer grazing enterprise.

Effectively there was no information as to the management practices in the 2014/15 years when the property was in its final period as a golf course. It is safe to assume there was no stock grazing, no supplementary feed sold off the property and that fertiliser inputs would have been minimal.

I have built an Overseer file representing this, and while there is no supporting evidence, I am reasonably confident that it reasonably represents the farm situation in the 2014/15 year.

The Singleton's were able to provide a number of invoices from contractors confirming fertiliser applications and crop establishment. There were no invoices confirming baleage sales, though there were some diary notes available.

The full Overseer files are available, however it would appear that as a golf course the property was leaching an estimated 10 kg of nitrogen/ha in the 2014/15 season. In the first year of the Singleton's ownership there was some sorghum cropping on approximately 20 hectares. There was only an estimated 40 bales exported off the property with the remainder being used as mulch under the trees. N leaching under that scenario was estimated at 11 kg of nitrogen/ha by Overseer.

An Overseer file representing the grazing operation was constructed on the basis of five heifers per hectare with a small area of summer crop planted to provide supplementary feed. N use was minimal. Overseer indicates that N leaching under this scenario would have been 19 kg of nitrogen/ha.

A third model was done looking at the property from a commercial maize perspective. The only additional allowance I have made for this scenario was to make an assumption that the property had been cropped for a number of years previously, and that the property had reached a status quo position. This was done because Overseer assumes that when ground is cultivated from pasture for the first time and planted in maize, there is a very high nitrogen mineralisation and N losses can be as high as 160 kgN/ha. Over time the maize cropping reaches a more long-term status quo N leaching position, and it is this that I have used in the analysis.

Under this scenario, and assuming the property had been cropped for 10 years for maize, there was still 19 kg of nitrogen/ha being leached.

9.0 Appendices

9.1 S-Maps



Manaaki Whenua
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S-map Soil Report

Environment Waikato

Report generated: 19-Dec-2018 from <https://smap.landcareresearch.co.nz>

S-map maps soils at a nominal scale of 1:50,000. At this scale it is common to identify two or more soil siblings that are likely to be present at the selected location. A more detailed resolution is needed to produce map units comprising a single soil sibling. Therefore, it is recommended that users consider the characteristics of each of the identified siblings, the expected proportion of each, and select the S-map sibling that best matches their field observations of the paddock. If no local information is available then it is common practice to select the dominant S-map sibling, i.e. the first listed sibling.

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.

Porchesterf

Mottled Orthic Brown Soil

Porch_10a.1 (50% of the mapunit at location (1794845, 5813949), Confidence: Low)

Key physical properties

Depth class (diggability)	Deep (> 1 m)
Texture profile	Clay
Potential rooting depth	Unlimited
Rooting barrier	No significant barrier within 1 m
Topsoil stoniness	Stoneless
Topsoil clay range	35 - 45 %
Drainage class	Imperfectly drained
Aeration in root zone	Moderately limited
Permeability profile	Moderate Over Slow
Depth to slowly permeable horizon	70 - 100 (cm)
Permeability of slowest horizon	Slow (< 4 mm/h)
Profile available water	(0 - 100cm or root barrier) Moderate (119 mm)
	(0 - 60cm or root barrier) Moderate (74 mm)
	(0 - 30cm or root barrier) Moderate (41 mm)
Dry bulk density, topsoil	1.08 g/cm ³
Dry bulk density, subsoil	1.26 g/cm ³
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	No significant stony layer within 1 m

Key chemical properties

Topsoil P retention	Medium (36%)
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About this publication

- This information sheet describes the *typical average properties* of the specified soil to a depth of 1 metre.
- For further information on individual soils, contact Landcare Research New Zealand Ltd: www.landcareresearch.co.nz
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Manaaki Whenua
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Porchesterf

S-map ref: Porch_10a.1

Porch_10a.1 (50% of the mapunit at location (1794845, 5813949), Confidence: Low)

Additional factors to consider in choice of management practices

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

Soil structure integrity

Structural vulnerability	Moderate (0.54)
Pugging vulnerability	not available yet

Water management

Water logging vulnerability	Moderate
Drought vulnerability - if not irrigated	Moderate
Bypass flow	Medium
Hydrological soil group	C
Irrigability	Strongly rolling land with moderate drainage/permeability restrictions and soils with moderate PAW

Contaminant management

N leaching vulnerability	Medium
P leaching vulnerability	not available yet
Bypass flow	Medium
Dairy effluent (FDE) risk category	C
Relative Runoff Potential	High

Additional information

Soil classification	Mottled Orthic Brown Soils
Family	Porchesterf
Sibling number	10
Profile texture group	Clayey
Soil profile material	Stoneless soil
Rock class of stones/rocks	Not Applicable
Rock origin of fine earth	From Rhyolitic And Andesite Rock
Parent material origin	Colluvium

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

Functional Horizon	Thickness	Stones	Clay*	Sand*
Clayey Fine SI Firm	12 - 25 cm	0 %	35 - 45 %	5 - 12 %
Clayey Fine SI Firm	50 - 70 cm	0 %	40 - 65 %	5 - 15 %
Clayey Coarse	20 - 30 cm	0 %	50 - 75 %	5 - 10 %

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



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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: **Porch_10a.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.



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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.

Kinif

Acid Mesic Organic Soil

Kini_2a.1 (40% of the mapunit at location (1794747, 5814574), Confidence: Medium)

Key physical properties

Depth class (diggability)	Deep (> 1 m)
Texture profile	Peat
Potential rooting depth	80 - 100 (cm)
Rooting barrier	Anoxic conditions
Topsoil stoniness	Stoneless
Topsoil clay range	35 - 50 %
Drainage class	Very poorly drained
Aeration in root zone	Very limited
Permeability profile	Moderate
Depth to slowly permeable horizon	No slowly permeable horizon
Permeability of slowest horizon	Moderate (4 - 72 mm/h)
Profile available water	(0 - 100cm or root barrier) Very high (500 mm)
	(0 - 60cm or root barrier) Very high (300 mm)
	(0 - 30cm or root barrier) Very high (150 mm)
Dry bulk density, topsoil	0.27 g/cm ³
Dry bulk density, subsoil	0.27 g/cm ³
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	No significant stony layer within 1 m

Key chemical properties

Topsoil P retention	Medium (37%)
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Kinif

S-map ref: Kini_2a.1

Kini_2a.1 (40% of the mapunit at location (1794747, 5814574), Confidence: Medium)

Additional factors to consider in choice of management practices

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

Soil structure integrity

Structural vulnerability	Very low (0.38)
Pugging vulnerability	not available yet

Water management

Water logging vulnerability	High
Drought vulnerability - if not irrigated	Low
Bypass flow	High
Hydrological soil group	B/D
Irrigability	Flat to very gently undulating land with moderate drainage/permeability restrictions and soils with high to very high PAW

Contaminant management

N leaching vulnerability	Very Low
P leaching vulnerability	not available yet
Bypass flow	High
Dairy effluent (FDE) risk category	B
Relative Runoff Potential	Low

Additional information

Soil classification	Acid Mesic Organic Soils
Family	Kinif
Sibling number	2
Profile texture group	Peaty
Soil profile material	Organic deep
Rock class of stones/rocks	Not Applicable
Rock origin of fine earth	Not Applicable
Parent material origin	Peat

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

Functional Horizon	Thickness	Stones	Clay*	Sand*
Organic Humic	15 - 25 cm	0 %	35 - 50 %	10 - 20 %
Organic Humic	75 - 85 cm	0 %	40 - 60 %	10 - 30 %

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



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Soil description page

1. Select **Link to S-map**
2. Under S-map sibling data enter the S-map name/ref: **Kini_2a.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.
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Kinif

Acid Mesic Organic Soil

Kini_2a.1 (40% of the mapunit at location (1794747, 5814574), Confidence: Medium)

Key physical properties

Depth class (diggability)	Deep (> 1 m)
Texture profile	Peat
Potential rooting depth	80 - 100 (cm)
Rooting barrier	Anoxic conditions
Topsoil stoniness	Stoneless
Topsoil clay range	35 - 50 %
Drainage class	Very poorly drained
Aeration in root zone	Very limited
Permeability profile	Moderate
Depth to slowly permeable horizon	No slowly permeable horizon
Permeability of slowest horizon	Moderate (4 - 72 mm/h)
Profile available water	(0 - 100cm or root barrier) Very high (500 mm)
	(0 - 60cm or root barrier) Very high (300 mm)
	(0 - 30cm or root barrier) Very high (150 mm)
Dry bulk density, topsoil	0.27 g/cm ³
Dry bulk density, subsoil	0.27 g/cm ³
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	No significant stony layer within 1 m

Key chemical properties

Topsoil P retention	Medium (37%)
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Kinif

S-map ref: Kini_2a.1

Kini_2a.1 (40% of the mapunit at location (1794747, 5814574), Confidence: Medium)

Additional factors to consider in choice of management practices

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

Soil structure integrity

Structural vulnerability	Very low (0.38)
Pugging vulnerability	not available yet

Water management

Water logging vulnerability	High
Drought vulnerability - if not irrigated	Low
Bypass flow	High
Hydrological soil group	B/D
Irrigability	Flat to very gently undulating land with moderate drainage/permeability restrictions and soils with high to very high PAW

Contaminant management

N leaching vulnerability	Very Low
P leaching vulnerability	not available yet
Bypass flow	High
Dairy effluent (FDE) risk category	B
Relative Runoff Potential	Low

Additional information

Soil classification	Acid Mesic Organic Soils
Family	Kinif
Sibling number	2
Profile texture group	Peaty
Soil profile material	Organic deep
Rock class of stones/rocks	Not Applicable
Rock origin of fine earth	Not Applicable
Parent material origin	Peat

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

Functional Horizon	Thickness	Stones	Clay*	Sand*
Organic Humic	15 - 25 cm	0 %	35 - 50 %	10 - 20 %
Organic Humic	75 - 85 cm	0 %	40 - 60 %	10 - 30 %

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



Manaaki Whenua
Landcare Research

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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: **Kini_2a.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.



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THE WAIKATO COMMUNITY HAS CONSISTENTLY IDENTIFIED WATER QUALITY AS THE TOP ISSUE FOR THE WAIKATO REGION FOR THE PAST TWO DECADES.

Healthy Rivers/Wai Ora Proposed Waikato Regional Plan Change 1 is the bold response to addressing the complex problem of water quality facing our Waikato and Waipā Rivers.

The proposed plan change gives effect to Government legislation on the management of fresh water (passed in 2014) and Te Ture Whaimana o Te Awa o Waikato (The Vision and Strategy for the Waikato and Waipā rivers) which was adopted by Government as part of Treaty Settlement legislation. The regional council has a legal requirement to give effect to both of these.

The proposed plan has been developed using a collaborative process involving community and sector representation which has ensured that those who are most affected by the changes have been at the table developing the policy and providing input and feedback from their communities and sectors over the last 2.5 years.

The proposed plan aims to encompass or include all landowners over 2ha within the Waikato River and Waipā River catchments.

New rules will complement existing rules in the Waikato Regional Plan. Existing rules in the Waikato Regional Plan will continue to apply, e.g. farm dairy effluent rules, earthwork rules and point-source discharge rules.

ADDITIONAL REQUIREMENTS FOR FORESTRY (5.1.5Q)

In addition to provisions already in the regional plan that manage forestry, there will be new requirements to ensure harvesting operations are managed. Council must be notified 20 working days prior to beginning harvest operations. Notification must include a harvest plan that clearly identifies the area to be harvested and how risks to water bodies will be managed.

A harvest plan should include:

- Title, date and harvest boundary
- Location of existing and proposed roads, tracks, landings, fire breaks and stream crossings
- Location of all water bodies, streams and wetlands and measures to control sediment discharges into water
- Operations restrictions around water bodies

- Location of any protected riparian vegetation and significant natural areas and how they will be protected
- Proposed harvest methodology
- Proposed slash disposal areas and management

POINT SOURCES POLICY (DISCHARGE CONSENTS ETC.)

The water quality objectives in the proposed plan change also include point source discharges (e.g. urban storm water, municipal wastewater). These point source objectives and policies are to be applied when any existing or proposed discharges are consented. Resource consent applications will also need to look at whether the current discharge treatment reflects the "best practicable option" and how adverse effects are avoided, remedied or mitigated depending on the concerns of the particular subcatchment.

SCHEDULE A - REGISTRATION

Between 1 May 2020 and 30 November 2020, all rural properties > 2ha must provide Waikato Regional Council with information that includes:

- landowner/land user details and other basic information
- details of land use activities undertaken at date of plan change notification
- (if grazing animals) stocking rate, location of water bodies and any adjacent fences, location of livestock crossing points and type of structures
- map which highlights the above

SCHEDULE B - NITROGEN REFERENCE POINT

Properties over 20ha must provide Waikato Regional Council with a NRP (highest annual leaching loss in either the 2014/15 or 2015/16 financial year for the property) and associated data. NRP must be provided between 1 May 2020 and 30 November 2020.

All commercial vegetable production properties or enterprises

must provide Waikato Regional Council with a NRP (average N leaching losses from 1 July 2006 to 30 June 2016) and associated data at the date of lodgement of resource consent. All NRPs are calculated using OVERSEER® or other approved model.

SCHEDULE C - STOCK EXCLUSION

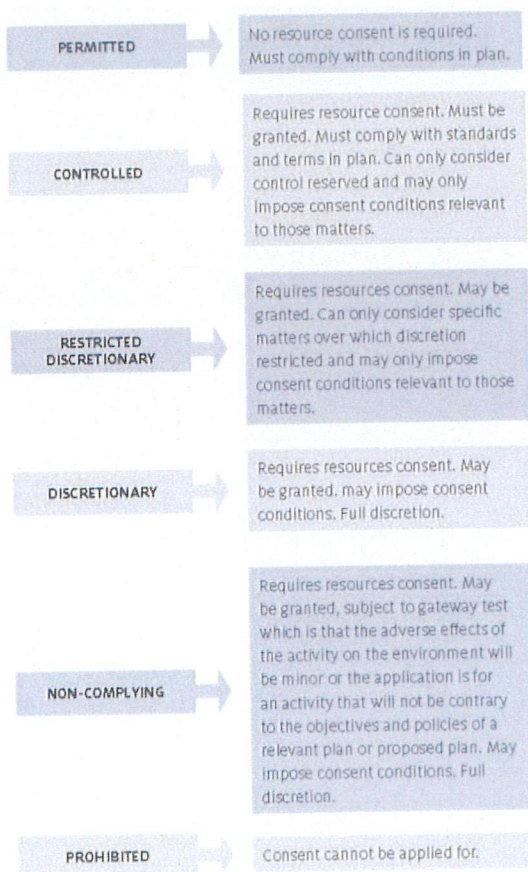
Properties grazing cattle, horses, deer or pigs must have fences or stock proof natural barriers to prevent them from entering water bodies. Water bodies for stock exclusion in this plan change are any:

- rivers that continually contain surface water
- drains that continually contain surface water
- wetlands, including constructed wetlands
- lakes

The setback distance and the need for stock exclusion does vary depending on the applicable rule, slope etc. There is no requirement to move existing fences or stock proof natural barriers to the applicable setback.

ACTIVITY STATUS

Depending on the size of your property and how you use your land, your farm will fall into the different categories outlined below.



RULE 1 - SMALL AND LOW INTENSITY FARMING ACTIVITIES

Permitted activity (see activity table)

This rule applies to farming activities on properties that are not used for commercial vegetable production and are not part of a multi-property enterprise and are registered (Schedule A) and have stock excluded (Schedule C) and are either:

- ≤ 4.1 ha OR
- >4.1 ha with <6 stock units/ha, no arable cropping

RULE 2 - OTHER FARMING ACTIVITIES (LOW-RISK PROPERTIES)

Permitted activity (see activity table)

This rule is designed to identify properties with low risk factors which do not need a Farm Environment Plan. It applies to farming activities on properties that are not commercial vegetable production and are registered (Schedule A) and have stock excluded (Schedule C) and can meet either set of the following conditions:

Properties >4.1 ha and ≤ 20 ha with >6 stock units/ha OR arable cropping AND not part of multi-property enterprise AND

1. Stocking rate has not increased since notification (if grazing) OR
2. Nitrogen, phosphorus, sediment and microbial pathogen losses have same or lower discharges since notification (if not grazing) AND
3. Water bodies are fenced so that any new fences keep cattle, horses, deer and pigs at least 3m away from water body

Properties >20 ha with >6 stock units/ha OR arable cropping:

1. N loss doesn't exceed Nitrogen Reference Point (see Schedule B) or 15kg N/ha/year (whichever lesser) AND
2. no land $>15^\circ$ slope cultivated or grazed AND
3. no soil cultivation occurs within 5m of a water body AND
4. no winter forage crops grazed in situ AND
5. Water bodies are fenced and stock are excluded. Any new fence are located to keep cattle, horses, deer and pigs at least 3m away from water body

Note: Properties between 4.1 and 20ha do not require a Nitrogen Reference Point modelled through OVERSEER, but must provide verification that they comply with points 1 and 2.

FEPs are a key aspect of the proposed plan change as they allow landowners to tailor their farm plan to suit the farm system, landscape/localised features and potential future changes. Farm plans help to identify areas where contaminants are lost, and identify appropriate mitigations.



Rules 3 & 4 are the two key rules for the majority of pastoral, horticultural and arable farming enterprises within the Waikato and Waipā catchments. The two options include the same approach for FEPs, but different routes. These are outlined below.

RULE 3 - FARMING ACTIVITIES WITH A FARM ENVIRONMENT PLAN UNDER A CERTIFIED INDUSTRY SCHEME

Permitted activity (see activity table)

Properties, excluding commercial vegetable production, that do not come under Rules 1 or 2, and are registered to a Certified Industry Scheme. Properties must also be registered (Schedule A) and stock excluded (Schedule C) and must provide a Farm Environment Plan to Waikato Regional Council and adhere to it by:

- 1 March 2022 for priority 1 sub-catchments, and properties with a Nitrogen Reference Point greater than 75th percentile nitrogen leaching value
- 1 March 2025 for priority 2 sub-catchments,
- 1 July 2026 for priority 3 sub-catchments,

Note: Certified Industry Schemes will have to be approved by Waikato Regional Council. Schedule 2 sets out the requirements for an industry scheme.

RULE 5 - EXISTING COMMERCIAL VEGETABLE PRODUCTION

Controlled activity (see activity table)

Commercial vegetable production enterprises operating under an approved Farm Environment Plan (in place by March 2022) as part of an industry scheme are a controlled activity as long as the area of the enterprise does not exceed the maximum area occupied by that enterprise from 1 July 2006 to 1 July 2016 and the enterprise does not exceed its Nitrogen Reference Point (see Schedule B).

Note: Policies require a reduction in 10% of nitrogen discharges across the sector by 2026.

RULE 6 - USE OF LAND FOR FARMING ACTIVITIES

Restricted discretionary activity (see activity table)

Properties used for farming activities but not covered by preceding rules.

RULE 4 - FARMING ACTIVITIES WITH A FARM ENVIRONMENT PLAN NOT UNDER A CERTIFIED INDUSTRY SCHEME

Controlled activity (see activity table)

This applies to properties which do not come under Rules 1 and 2, farming where land use is not registered to Certified Industry Scheme is a controlled activity provided;

- It has an FEP provided by certified person as part of a consent application
- FEPs are in place by 'priority dates' (see table)
- Stock (Schedule C) are excluded from water bodies
- All stock are excluded within 3 years of priority date or at the latest by 2026 (whichever is soonest)
- FEP shows how NRP is complied with as measured via 5 year rolling average in OVERSEER
- FEP for 75th percentile prepared before 2022.

Note: Policy 2(d) says that reductions must be proportionate to the amount of current discharge (those discharging more are expected to make greater reductions) and proportionate to the scale of water quality improvement required in the sub-catchment.

RULE 7 - LAND USE CHANGE

Non-complying activity (see activity table)

The following land use changes (greater than 4.1ha) are non-complying activities from date of notification and therefore require a resource consent.

CURRENT LAND USE		NEW LAND USE
Woody vegetation	➔	Pastoral farming
Any livestock grazing and/or arable cropping	➔	Dairy farming
Any land use	➔	Commercial vegetable growing

*Dairy farming means farming of dairy cows on a milking platform for milk production.

This information has been provided based on Waikato Regional Council's interpretation of the proposed plan. The proposed plan is subject to change through the hearings process.

Note: Provision is made in Objectives and Policies for some flexibility for development of tangata whenua ancestral lands. This is to recognise that flexibility has been restricted in the past due to legal and/or historical impediments.

Any land that does change use will also be subject to other rules, for example the requirement to have a Farm Environment Plan under Rule 3 or 4. A Nitrogen Reference Point for any new land use will be established as part of the consent application.

PROPOSED KEY DATES FOR THE RULES

22 OCTOBER, 2016	➔	Land use change rule in effect
1 MAY 2020 TO 30 NOVEMBER 2020	➔	All properties over 2ha register with the Waikato Regional Council All properties over 20ha provide their nitrogen reference points
1 MARCH 2022	➔	Priority 1 sub-catchments, the 75th percentile nitrogen leaching value dischargers and commercial vegetable production complete their Farm Environment Plans
1 MARCH 2025	➔	Priority 2 sub-catchments complete Farm Environment Plans Priority 1 sub-catchments complete stock exclusion
1 JULY 2026	➔	Priority 3 sub-catchments complete Farm Environment Plans Priority 2 and 3 sub-catchments complete stock exclusion Leaching exceeding the 75th percentile has been reduced to meet the 75th percentile Land use change rule expires



 WAIKATOREGION.GOV.T.NZ/HEALTHYRIVERS

 HEALTHYRIVERS@WAIKATOREGION.GOV.T.NZ

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HE HAPORI HIIHRI VIBRANT COMMUNITIES

 Healthy Rivers
PLAN FOR CHANGE
Wai Ora
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Te Kaitiaki o Waikato

5546

Contact

Dave Miller

Agribusiness Consultant
021 287 7070
dave.miller@agfirst.co.nz

AgFirst Waikato (2016) Ltd

26D Liverpool Street
PO Box 9078, Hamilton 3240, New Zealand
07 839 2683
waikato@agfirst.co.nz
www.agfirst.co.nz

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