AGFIRST

Independent
Agriculture
& Horticulture
Consultant
Network

Avenue Business Park (Private Plan Change 58)

Prepared for

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1.0 EXECUTIVE SUMMARY

Warwick and Marion Steffert have made a request to Matamata-Piako District Council (MPDC) for a Private Plan Change (PPC58). This involves two parcels of land located at 2581 State Highway 26, Morrinsville (Site) within the Matamata-Piako District. PPC58 is part of proposed Stage 2 of the Avenue Business Park Business development, which is seeking to rezone approximately 13.4 ha from Rural Zone to General Industrial Zone (GIZ) at the western end of Morrinsville.

AgFirst Waikato (2016) Ltd has been engaged to provide productivity assessment of PPC58 against the National Policy Statement – Highly Productive Land (NPS-HPL). This relates to an assessment on whether it is considered PPC58 meets the circumstances in which urban rezoning may be undertaken as set out in Clause 3.6 of the NPS-HPL.

The block is run as an extremely small-scale beef grazing operation (more akin to a hobby farm). Under the New Zealand Land Resource Inventory (NZLRI), 13.1 ha of the Site is classified as HPL (Land Use Capability (LUC) 2), with 0.3 ha of non HPL Land (LUC 4). However, The NZLRI LUC does not take into account unproductive areas, such as existing buildings, tracks and modified soils. Specific to this Site is a farm track that extends the length of property and provides access to each paddock, stock yards and ancillary sheds to the south of the property, and the construction earthworks to the north of the Site which have recently been completed as part of the development of Stage 1 of the Avenue Business Park. Once the non-HPL and unproductive areas have been accounted for, the HPL area remaining is approximately 7.9 ha across the PPC58 Site[1]. Therefore, the Site is significantly impacted by fragmentation, size and soil quality with regards to future land use potential.

The key limitations for land-based primary production and versatility on the Site are:

- Lack of size
- Poor draining soils on the lower terrace
- Sloping land and modified soils to the north from earthworks
- Inability to achieve scale through neighbouring farms, due to land use change restrictions
- Neighbouring land to the east and south-east zoned industrial and business
- Non-reversable land fragmentation to the south and west

In order to meet the requirements of the NPS-HPL, AgFirst has assessed alternative options for expansion of other existing industrial areas in Morrinsville to meet growth requirements. This includes consideration of whether the alternative options would result in loss of soils and HPL that has a relatively lower productive capacity than the PPC58 Site. Given the constraints identified for the PPC58 Site, AgFirst believes that the re-zoning of the PPC58 Site meets the requirements of the NPS-HPL Clause 3.6(4)(b), where land surrounding other industrial zones in Morrinsville has greater productive capacity and a greater proportion of HPL. There are no other reasonably practicable and feasible options that would result in greater protection of HPL for land-based primary production.

AgFirst has also assessed the costs of allowing the proposed urban rezoning from Rural to GIZ in terms of the loss of HPL for land-based primary production to inform the assessment that is required under Clause 3.6(4)(c) of the NPS-HPL. The productive nature of the Site is already significantly compromised due to the earthworks which have occurred for Stage 1 of the Avenue Business Park and due to the other limitations within the Site which are referred to above. AgFirst

[1] The 7.9ha area is shown with red shading on Figure 2.

does not consider that the loss of the well below average productivity from this Site will have a significant loss on the district's production, and the conversion of the land into GIZ would not cause any fragmentation or further disruption of additional HPL.

2.0 BACKGROUND

Warwick and Marion Steffert have made a request to Matamata-Piako District Council (MPDC) for a Private Plan Change (PPC58). This involves two parcels of land located at 2581 State Highway 26, Morrinsville (Site) within the Matamata-Piako District. PPC58 is part of proposed Stage 2 of the Avenue Business Park Business development, which is seeking to rezone approximately 13.4 ha from Rural Zone to General Industrial Zone (GIZ). Presented in Figure 1 is the outline (in Red) of the Site in relation to Stage 1 of the Avenue Business Park and other land use zoning at the western end of Morrinsville.

The area that has been assessed is a 13.4 hectares (ha) site which is legally described as Lot 2 DPS 78100 (SA62A/392) and Lot 1 DPS 78100 (SA62A/391). Adjoining sites to the east are zoned Industrial, to the south-east Business Zone and adjoining sites to the north, south and west are zoned Rural. There are also Business and Rural Residential zoned properties in the wider area. The block is currently utilised as an extensive low input pastoral grazing block.

AgFirst has been engaged to provide a productivity assessment of PPC58 against the National Policy Statement – Highly Productive Land (NPS-HPL). This relates to an assessment on whether it is considered PPC58 meets the circumstances in which urban rezoning of HPL may be undertaken as set out in Section 3.6 of the NPS-HPL. AgFirst is a suitably qualified agribusiness consultancy that has a wealth of experience in assessments relating to productive capacity, primary production and soil versatility. Our assessment should be read in conjunction with other assessments which accompany the plan change request for PPC58, including the planning and economic analyses.

In order to meet the requirements of the NPS-HPL, AgFirst has assessed alternative options for expansion of other existing industrial areas in Morrinsville to meet growth requirements. AgFirst has also assessed the costs of allowing the proposed urban rezoning from Rural to GIZ in terms of the loss of HPL for land-based primary production. These assessments are relevant to consideration of PPC58 under Clause 3.6(4)(b) and (c) of the NPS-HPL.

This report supersedes an earlier version that was dated September 2022. The primary reason for updating the report is to address changes to the site which have occurred in the intervening period due to earthworks associated with Stage 1 of the Avenue Business Park development. The updates also reflect our recent experience on similar projects. The earlier version of the report was completed a very short time after the NPS-HPL was gazetted.

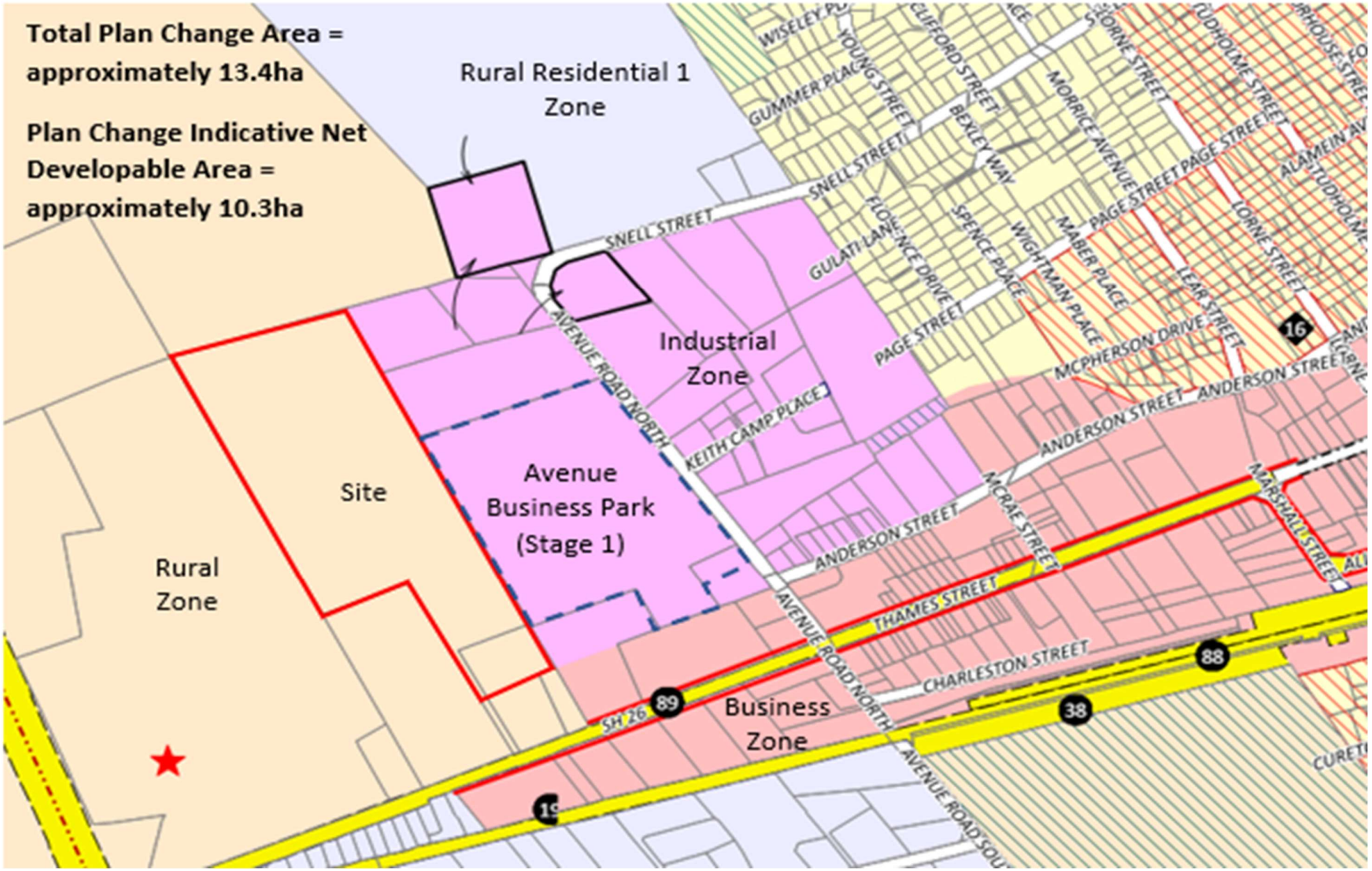


Figure 1: Proposed Plan Change 58 Site

3.0 PROPERTY SUMMARY EXISTING LAND USE

The Site highlighted in Figure 1 shows a parcel of land that extends over two titles, both owned by Warwick and Marion Steffert.

The rear title consists of a 12.65 ha block that is used as a small-scale beef grazing operation. The front property includes a house with a surrounding lifestyle section. The total title size is 1.61 ha, however only the northern extent (~0.8 ha) is proposed to be rezoned under PPC58. This area is run in conjunction with the rear property. There are also ancillary sheds, stock yards and farm tracks located on this part of the site.

The PPC58 site is in pastoral cover with a central race, a network of farm drains, fully subdivided paddocks with good quality fences and reticulated stock drinking water with troughs located in each paddock. The Site comprises a flat area in the south (of approximately 8.8 ha) and a moderately sloping area in the north (of approximately 4.6 ha).

The northern part of the Site has been consented for construction earthworks which have recently been completed as part of the development of Stage 1 of the Avenue Business Park. Land to the north is part of a borrow site, with a tip site and sediment retention pond and haul road all part of the earthworks. This impacts approximately 4.2 ha of the HPL area. This is presented in Figure 2. Once the earthworks area, farm track, stock yards and ancillary sheds are deducted, the effective area of HPL remaining is 7.9 ha.

While the earthworks are not a permanent feature, they will have an impact on the productive capacity of the soils. These soils have been re-classified as non-HPL and this is discussed in further detail in Section 5.2.4. Once the earthworks area has been reinstated back into pasture, which is the intention within the short-term, this land will once again become available for animal grazing. However, versatility will be limited for alternative production purposes.

At the time of the initial AgFirst site visit (21 July 2022), the block was run as an extremely small-scale beef grazing operation (more akin to a hobby farm), with approximately 20 rising two-year old (R2) beef cattle, 7 rising one-year old (R1) beef cattle, 6 calves and 1 mixed age cow. Based on approximately 13.0 effective ha (removing tracks, sheds and curtilage), this is a Revised Stock Unit (RSU) per ha of 12 over-wintered. The RSU is used to apply a relative weighting per stock class and has been taken from the Proposed Waikato Regional Plan Change 1 - Decisions Version (PC1). An R2 steer is an animal that is between 1-2 years old and is the equivalent of 5.8 RSU. For comparison, one dairy cow is the equivalent of 10.4 RSU. The RSU stock calculator is provided in Figure 3.

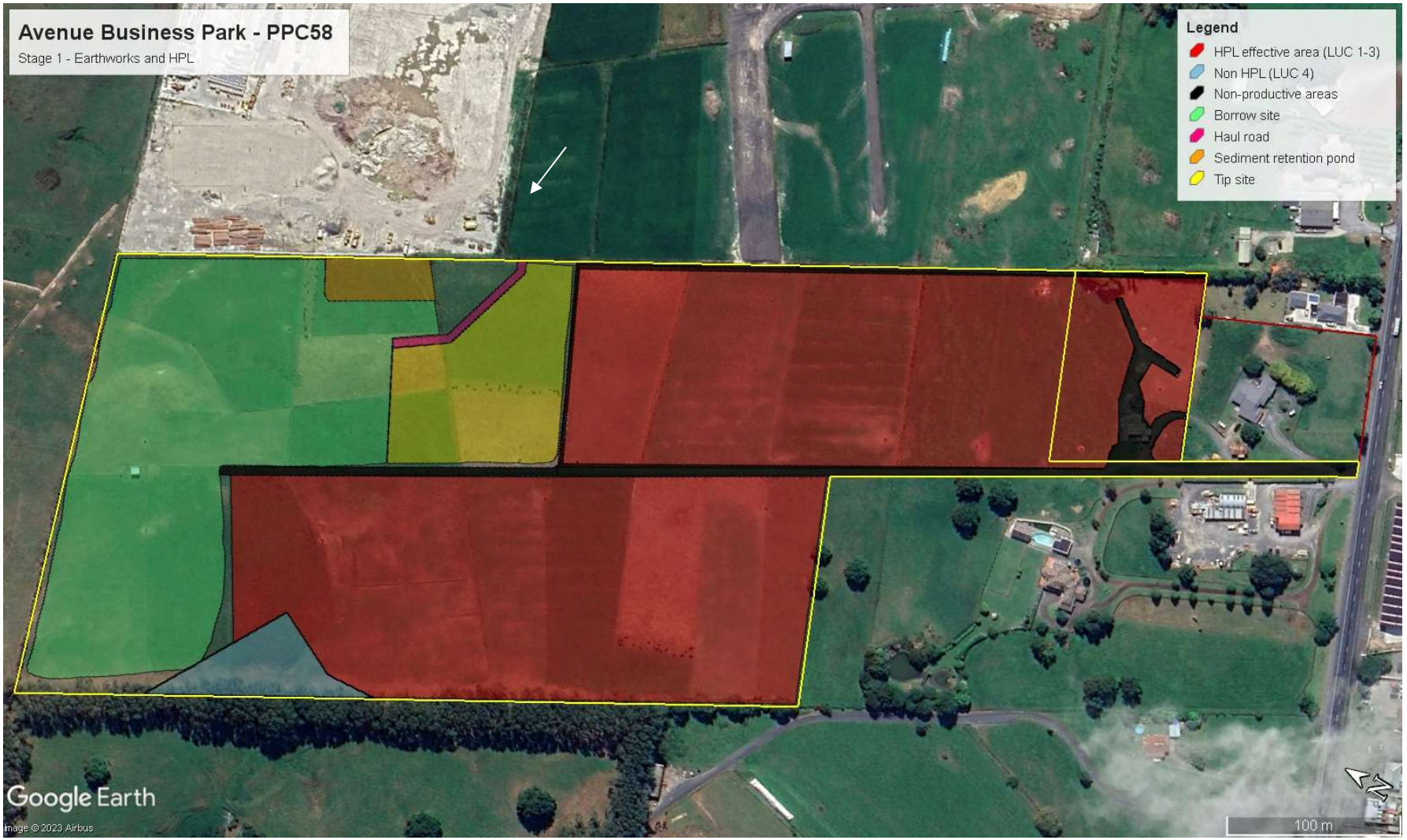


Figure 2: Stage1 Consented Earthworks

Farm Name	Waikato Farm	Total RSU on Farm	Total RSU per ha
Farm Size (ha)	13.4		
Block Name	Block Area (ha)		
PPC58 Site	13.0	152	12

Stock class	SU/ha	Animal performance definition	PPC58 Site	RSU per Stock Class
			13 ha	
Dairy bull	6.1	620kg Friesian breeding bull		
Dairy cow	10.4	450kg F8J8 dairy cow producing 400kg MS		
Dairy heifer 1-2 years age	5.1	F8J8 199 -419kg Jul to Apr		
Dairy heifer calf (weaned)	1.6	F8J8 110 -199kg Dec to Jun		
Beef bull	6	620kg Beef cross MA breeding bull		
Beef cow	7.5	480kg MA Beef cross breeding cow calving at	1	7.5
Bull 1-2 years age	6.8	Friesian bull 209kg to 535kg slaughter weight		
Steer 1-2 years age	5.8	WF steer 203kg to 478kg slaughter weight	20	116
Heifer 1-2 years age	5.7	WF heifer 208kg to 420kg slaughter weight		
Steer calf< 1 year (weaned)	2.7	WF steer 100kg to 203kg Dec to Jun	7	18.9
Bull calf< 1 year (weaned)	2.7	Friesian 100kg to 209kg bull Dec to Jun		
Heifer calf< 1 year (weaned)	1.6	WF heifer 90kg to 208kg Dec to Jun	6	9.6
Ram	1	73kg Romney ram, 4.5kg wool		
Adult ewe	1.01	63kg Romney MA ewe lambing at 126%, 4.5kg		
Sheep 1-2 years of age	0.9	Romney hogget 46kg to 66kg, 4kg wool		
Sheep <l years of age (weaned)	0.5	Romney 26kg to 46kg from Dec to June, 2kg		
Total Animals on Farm / Block			34	152

Stock units taken from stocking rate table on Pg 59 of the decisions version of the Proposed Waikato Regional Plan Change 1

Figure 3: Revised Stocking Rate (RSU) calculator

The following financial analysis has been based on the current stocking system (i.e. the PPC58 Site in Figure 3). To understand the economic viability of the property with regards to land-based primary production, the Beef and Lamb New Zealand (B+LNZ) data for Northern North Island Class 5 finishing farm, the forecast farm profit before tax is estimated as being $868 per ha[2]. The full analysis is included in Appendix A. Note that this economic figure is based on a North Island intensive finishing operation with a scale of 251 ha. Based on the entire effective area of the Site being used as a grazing block, this will provide an estimated income from the land of $11,287 before tax and property liabilities. Due to the inefficient scale of this block, compared to a full-scale intensive operation, the likely income is likely to be much lower than presented.

Under the current land use as a small-scale livestock grazing operation across 13 ha, an indicative budget is provided:

- Total current revenue using the B+LNZ data is estimated at $11,287.
- A long-term (30 year) average interest rate of 7% has been used[3].
- A nominal 40% debt loading has been assumed, which is a typical level for farm lending.
- Property information for rates and land valuation has been used as total annual liabilities for the property, with $50,837 required to service the property each year.
- This provides an annualised net economic deficit of -$39,550.

Changing the type of livestock run or management thereof will not sufficiently lift profitability because the property is not an economic size for pastoral grazing and the land is much too expensive. Due to the wetness limitations and scale, there is low versatility, and it has been assessed that pastural grazing is the highest and best land-based primary production for this land. This is further strengthened with the fact that the effective area of HPL has now reduced to 7.9 ha following the earthworks activity. As this area is to be re-established into pasture, the total

[2] https://beeflambnz.com/data-tools/sheep-beef-farm-survey

[3] Exchange rates and Wholesale interest rates - Reserve Bank of New Zealand - Te Pūtea Matua (rbnz.govt.nz) 1993-2023 years with a 2.2% bank margin applied to the 90 bank bill monthly average yield

income from the Site has remained the same but the land's utility for productive purposes is lower.

Additionally, the value of the land is not based on the productive potential or quality of the soil and land, but the location of the property for speculators, development opportunities and proximity to the existing urban area of Morrinsville. This means that the liabilities and debt servicing tied to the land are significantly higher than for a typical farming operation. This is supported by the land valuation for the property of $1,600,000 ($112,181 per ha) in the MPDC database (not considering the improvement value of the housing). This is compared to typical beef finishing blocks that would be valued at $10,000 - $15,000 per ha.

This indicates that the scale and land class of this Site is not at all profitable as a standalone beef farming operation. A farm of this size and scale to be run as a livestock operation is only suited as a hobby farm or lifestyle block. There is also very limited to no opportunity to expand the operational scale due to the established surrounding dairy farms, already zoned or developed land to the east and south-east and fragmented land ownership. Therefore, this Site is not considered suitable for long-term land-based primary production.

4.0 REGULATORY FRAMEWORK

4.1 Matamata Piako District Plan

The Operative Matamata-Piako District Plan (MPDP) includes 'sustainable activities' objectives and policies (Chapter 3.3.2, Land and Development) which recognise the importance of the District's high quality soils for productive rural use. The way that the district plan seeks to achieve these outcomes is by zoning land for urban purposes and by limiting subdivision and development in Rural zoned areas. The MPDP defines High quality soils as land classified as Class I, II and/or III of the New Zealand Land Inventory Worksheets.

4.2 Waikato Regional Policy Statement

The relevant objective and policy from the RPS are:

"LF-O5 – High class soils
The value of high class soils for primary production is recognised and high class soils are protected from inappropriate subdivision, use or development."

"LF-P11 – High class soils
Avoid a decline in the availability of high class soils for primary production due to inappropriate subdivision, use or development."

The objective and policy place an emphasis on protecting high class soils from 'inappropriate subdivision, use or development'. We note that the rezoning that is sought under PPC58 effectively acts as an expansion of an existing industrial area and there is already approximately 40 ha of Industrial Zone in the area surrounding Avenue Road North. The appropriateness of the proposal is addressed in the plan change request.

The RPS includes the following definitions[4]:

High class soils "*those soils in Land Use Capability Classes I and II (excluding peat soils) and soils in Land Use Capability Class IIIe1 and IIIe5, classified as Allophanic Soils, using the New Zealand Soil Classification."*

Primary production: *"means the commercial production of raw material and basic foods, and which relies on the productive capacity of soil or water resources of the region. This includes the cultivation of land, animal husbandry/farming, horticulture, aquaculture, fishing, forestry, or viticulture. It does not include hobby farms, rural residential blocks, or land used for mineral extraction."*

The reference to primary production excluding hobby farms is relevant to the PPC58 site. The assessment in Section 3 of this report concludes that the PPC58 site is operating as a hobby farm and is not suited to a productive farming operation.

[4] https://eplan.waikatoregion.govt.nz/eplan/#Rules/0/916/1/0/0

4.3 National Policy Statement for Highly Productive Land

In September 2022, the Ministry for the Environment (MfE) and the Ministry for Primary Industries (MPI) released the NPS-HPL. The single objective of the NPS-HPL is "*Highly productive land is protected for use in land-based primary production, both now and for future generations*."

Land-based primary production means "*production, from agricultural, pastoral, horticultural, or forestry activities, that is reliant on the soil resource of the land*".

Productive capacity, in relation to land, means "*the ability of the land to support land-based primary production over the long term, based on an assessment of:*

1) *physical characteristics (such as soil type, properties, and versatility); and*
2) *legal constraints (such as consent notices, local authority covenants, and easements); and*
3) *the size and shape of existing and proposed land parcels".*

Land which is zoned rural and which is Land Use Capability Class (LUC) 1, 2 and 3 must be treated as HPL under Clause 3.5(7) of the NPS-HPL prior to regional mapping of HPL being undertaken, unless the land was identified for future urban development or was subject to a Council initiated or adopted plan change at the commencement date of the NPS-HPL. Those exclusions do not apply for the PPC58 site.

LUC, 1, 2, or 3 land means *"land identified as Land Use Capability Class 1, 2, or 3, as mapped by the New Zealand Land Resource Inventory or by any more detailed mapping that uses the Land Use Capability classification".*

Policy 5 of the NPS-HPL has relevance and reads: "*The urban rezoning of highly productive land is avoided, except as provided in this National Policy Statement*". Clause 3.6(4) is the relevant clause as it provides that territorial authorities that are not Tier 1 or 2 (MPDC is Tier 3) may allow urban rezoning of highly productive land only in accordance with the matters contained within it. Clause 3.6(5) is also relevant. Those clauses are detailed below:

4) *Territorial authorities that are not Tier 1 or 2 may allow urban rezoning of highly productive land only if:*
   a) *the urban zoning is required to provide sufficient development capacity to meet expected demand for housing or business land in the district; and*
   b) *there are no other reasonably practicable and feasible options for providing the required development capacity; and*
   c) *the environmental, social, cultural and economic benefits of rezoning outweigh the environmental, social, cultural and economic costs associated with the loss of highly productive land for land-based primary production, taking into account both tangible and intangible values.*
5) *Territorial authorities must take measures to ensure that the spatial extent of any urban zone covering highly productive land is the minimum necessary to provide the required development capacity while achieving a well-functioning urban environment.*

AgFirst will address (in part) Clause 3.6(4)(b) in this report by assessing the productive capacity of the PPC58 Site and comparing this with additional localities surrounding Morrinsville that would be deemed to be 'other reasonably practicable and feasible options'. AgFirst will also address (in part) Clause 3.6(4)(c) in relation to the costs of allowing the proposed urban rezoning of the PPC598 site from Rural to GIZ in terms of the loss of HPL for land-based primary production.

5.0 LAND AND SOIL ASSESSMENT

Determining the presence of high-quality soils and HPL, as defined under the LUC classification, requires consideration of a range of characteristics, in accordance with the methods described in the third edition of the LUC Survey Handbook to assess the suitability of the land for primary production. These include such characteristics as erosion, susceptibility to flooding, wetness, land aspect and topography. Therefore, this assessment has taken the following steps to identify soils present within the Site:

- Desktop assessment of LUC from the NZLRI portal
- Visual soil analysis (VSA) and soil sampling
- Contours derived from the Waikato Regional Council (WRC) LIDAR database
- Landcare Research S-Map online, New Zealand Soils Classification (NZSC) and NZLRI national soil database

In addition to classifying the soils, AgFirst has assessed the productive use of the subject land, taking into account a range of characteristics of the proposed plan change area, which are relevant to the productive potential including:

- Soil characteristics
- Drainage
- The impact of the earthworks site on versatility and productive capacity
- Potential for sensitivity constraints from surrounding development and land use
- Economic limitations arising from small, fragmented portions of land and its productive potential

This Section presents the results and outcomes from the soil and LUC assessment based on information obtained on site and using the available New Zealand soils resources and database.

5.1 Land Use Capability Classification

The LUC classification system has been used in New Zealand to help achieve sustainable land development and management on farms. The purpose of the LUC classification is to assess the suitability of the land for primary production. Determining the presence of HPL as defined under the LUC classification requires consideration of a range of characteristics. The LUC classification categorises land areas or polygons into classes, subclasses, and units according to the land's capability to sustain productive use. The LUC is based on an assessment of the physical factors (rock type, soil, slope, present type and severity of erosion, and vegetation), climate, the effects of past land use, and the potential for erosion. This is summarised in Figure 4 below.

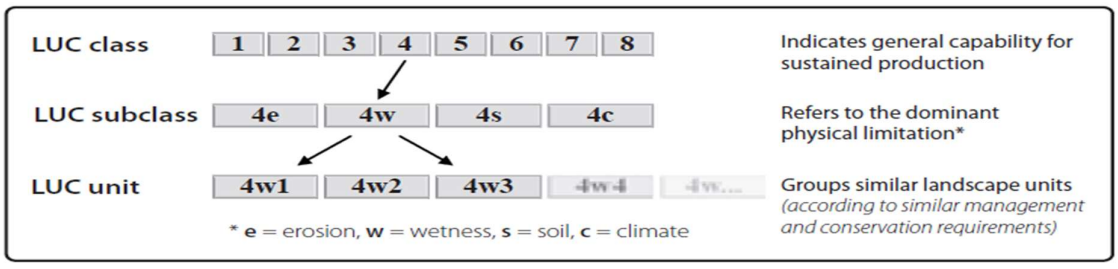


Figure 4: Components of the land use capability classification[5]

[5] Lynn, I.H, Manderson, A.K, Page, M.J, Harmsworth, G.R, Eyles, G.O, Douglas, G.B, Mackay, A.D, Newsome, P.J.F. (2009). Land Use Capability Survey Handbook – a New Zealand handbook for the classification of land 3rd ed. Hamilton, AgResearch; Lincoln, Landcare Research; Lower Hutt, New Zealand. GNS Science.

AgFirst has reviewed the NZLRI national database of physical land resource information for the Site. This database is based on a regional scale LUC rating of the ability of each polygon to sustain agricultural production. These have been produced at a 1:63,000 scale for the Waikato and are suitable for guidance, but are not specifically designed to be interpreted at a farm or paddock scale.

The soils mapped at the property are classified under the NZLRI as LUC 2s, LUC 2e and LUC 4e. 13.1 ha of the Site is LUC 2. The remainder of the Site is classed as LUC 4. The NZLRI LUC classifications for this area are presented in Table 1 and presented in Figure 5.

Table 1: Land Use Capability Classification for the Site

LUC Class	Slope Class	Colour on Map	Area
LUC 2	Flat to gently undulating (A) & Undulating (B)	Yellow	13.1 ha
LUC 4	Strongly rolling (D)	Light blue	0.3 ha
Total			**13.4 ha**

The slope of the Site is relatively flat land to undulating land for the majority (areas to the south), with some strongly rolling towards the north. While the NZLRI only shows a small area to the north with strongly rolling, following the farm visit and reviewing LIDAR data, this area is likely to be approximately 4.6 ha.

Most of the Site is classified under the NZLRI database as LUC 2. This indicates that the soils are in the of high-quality category and highly versatile, with these classifications being suitable for most productive agricultural systems. The NZLRI classifies these soils as an LUC 2s 3 - a typic orthic allophanic soil, made up of Horotiu silt loams. However, it is of AgFirst opinion, and supported by the S-Map soil classification and soil auger samples that these are typic orthic gley soils. The key limitation to these soils is the wetness and underlying poor drainage. It was noted that there was waterlogging to excessive wetness after drainage, consistent with the description for an LUC 3 or LUC 4 classification. The LUC handbook describes the wetness limitations for the various LUC subclasses as presented in Table 2[6]:

Table 2: LUC Handbook drainage characteristics

LUC subclass	Description	Days of continuous inundation
1w	Not applicable	
2w	Inundation lasting 1–2 days, not more frequently than once in 2 years. Yield of sensitive crops is affected but survival is not.	1
3w	Inundation lasting 1–2 days on average once per year; or lasting 2-3 days once every 2 years. Some crops do not survive. Others have reduced yield.	1-2
4w	Inundation lasting 2–4 days on average once per year. Cropping of annual ground crops is marginal, tree crop yields are reduced.	2-4

Therefore, with the wetness limitations of the lower terrace to the south and the slope limitations to the north, the distribution of soils suitable for versatile agricultural land use is relatively low. As detailed, the maps produced within the NZLRI have been produced at a 1:63,000 scale are not specifically designed to be interpreted at a farm or paddock scale. Thus, likely missing the wet soils and sloping land, which have severe underlying limitations to this land.

[6] LUC Handbook, 34d edition - Table 14 – The relationship between LUC classes with a 'w' limitation

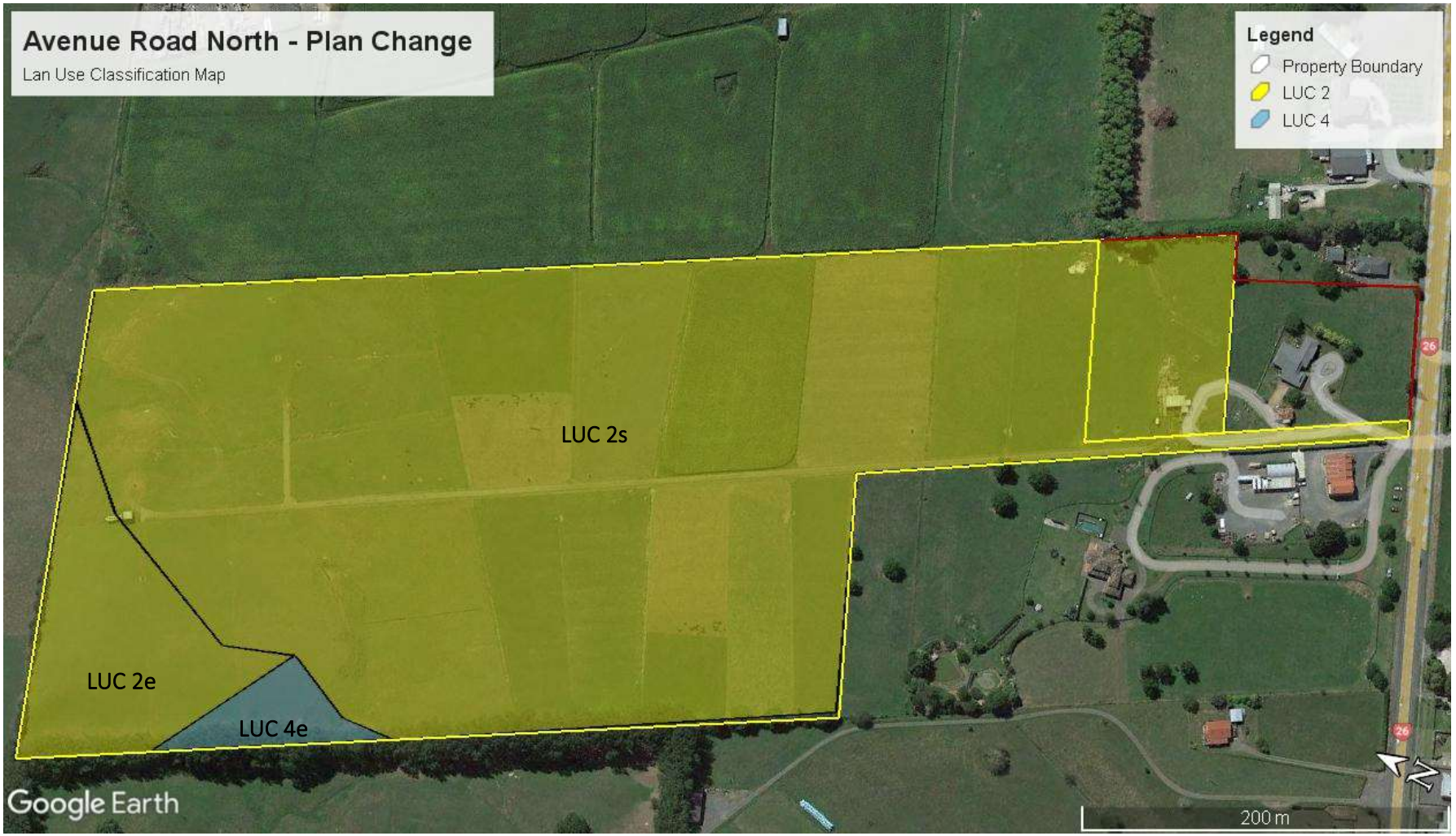


Figure 5: NZLRI Land Use Capability Classification Map for the Site

5.2 Soil Analysis

Having visited the property, it is clear that the boundary of the NZLRI LUC polygons are not accurate, as is often the case with these maps due to the regional mapping scale. As discussed in Section 5.1, the NZLRI produced LUC maps are intended for regional use and planning and are not designed to be used at a farm scale. At a scale of 1:50,000, this is equivalent to a 10 ha 'smallest area', which is only sufficient to capture major soils and landform types. The Land Use Capability Handbook cautions against enlarging LUC data beyond the scale at which it was gathered as it can produce unreliable and misleading results.

AgFirst visited the Site on 22 September 2022 to gain further understanding of the potential for this block for productive agriculture and to verify the presence of high-quality soils. This site visit was prior to the recent earthworks in the northern part of the Site associated with the Stage 1 Avenue Business Park development. In addition to the desktop LUC and soil maps, AgFirst undertook four visual soil analysis (VSA) across the Site and two soil samples for a mixed soil analysis - drystock. The soil sampling locations are AgFirst presented in Figure 6.

5.2.1 Visual Soil Analysis

AgFirst followed the procedures outlined in the Visual Soil Assessment Field Guide[7]. Many soil properties can be identified by their visual characteristics, which involves digging out and assessing a 20 cm cube of topsoil. The quality of soil is subject to the current and previous land use and management. Once soils have been degraded, it can take a long time (sometimes decades) to recover.

The soil indicators used in the VSA are: soil structure and consistence; soil porosity; soil colour; number and colour of soil mottles; earthworm counts and surface relief. Using the VSA scorecard, soil quality is ranked as poor (< 9), moderate (10 - 20) or good (> 20).

AgFirst completed the scorecard to identify the suitability of the soil for agricultural production. This information was used in conjunction with the NZLRI and online soils data for the Site.

A summary of the soil indicators from the VSA is detailed in Table 3 with photos of each sample presented in Figure 7. Soil # 1, 2 and 3 were on the flats, with poor draining gley soils. Soil # 4 is elevated on a slope, with moderately free draining granular soils.

[7] Shepherd, T.G. 2000: Visual Soil Assessment. Volume 1. Field guide for cropping and pastoral grazing on flat to rolling country. Horizons.mw & Landcare Research, New Zealand.

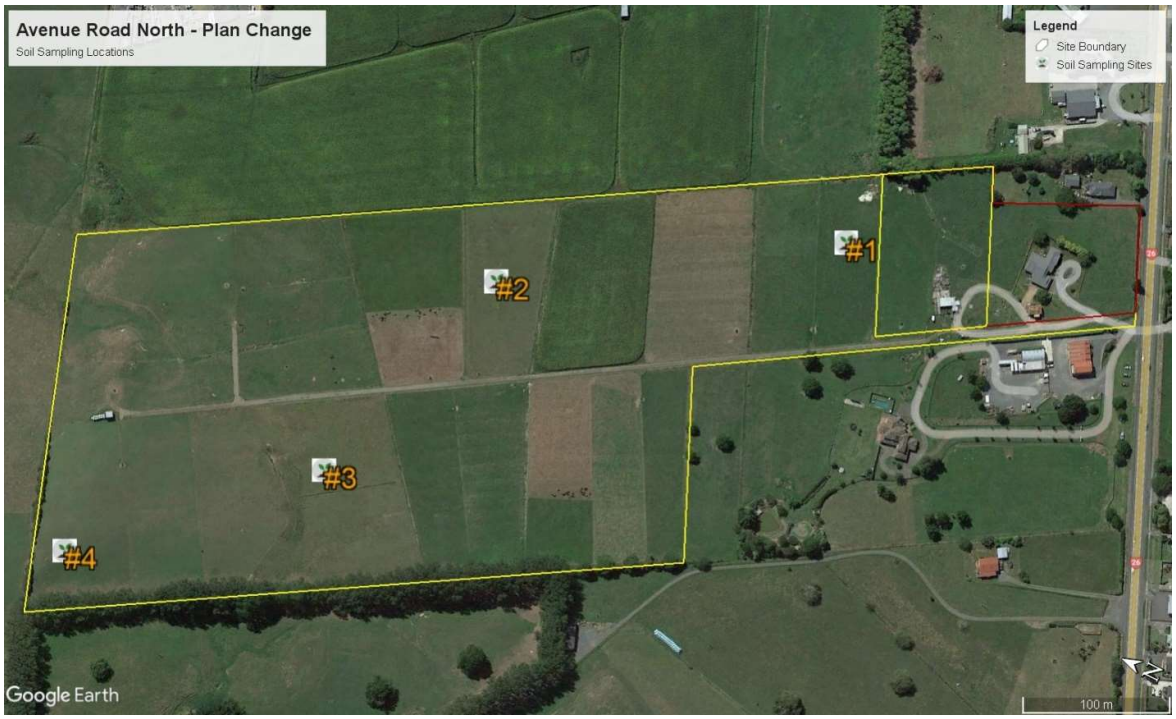


Figure 6: Location of Visual Soil Assessment and chemical soil sampling across the Site

Table 3: Visual Soil Assessment results undertaken at each location

Visual Indicator of Soil Quality	Soil # 1	Soil # 2	Soil # 3	Soil # 4
Soil Structure and Consistency	2	2	1	2
Soil Porosity	1	2	1	2
Soil Colour	1	1	1	2
Number and colour of Soil Mottles	1	1	1	2
Earthworm Counts	0	0	0	0
Surface Relief	1	1	1	2
Overall Score	**14**	**17**	**11**	**22**
Ranking	**Moderate**	**Moderate**	**Moderate**	**Good**

Soil Structure and Consistence

Soil # 1, 2 and 4 had good structure and distribution of finer aggregates, while soil # 3 had moderate structure, with proportions of both coarse firm clods and friable fine aggregates. The soil depth at soil # 1 and 3 was noticeably shallow, with approximately 15 cm of topsoil before hitting clay with strong mottling and pale coloured subsoils.

- Soil structure is vital for growing good pastures as it regulates soil aeration and gaseous exchange rates, the movement and storage of water, soil temperature, root penetration and development, nutrient cycling, and resistance to degradation.

Soil Porosity

Soil #1 and 3 had moderate porosity, with a moderate amount of consolidation. Soil # 2 and 4 showed good porosity.

- The macroporosity controls the movement of air and water in the soil. Low porosity will restrict air and water movement, which reduces root activity and pasture growth.

Soil Colour

All the lower soil sites (# 1 – 3) had moderate soil colour, as an indication of gleying due to pugging and water damage. Soil # 4 consisted of a dark and deep topsoil, indicating well aerated with a good turnover of organic matter.

Number and Colour of Soil Mottles

All the lower soil sites (# 1 – 3) had moderate soil mottling, between 10-25%. This is evidence of the poor drainage and resultant pugging and an elevated ground water table. Soil # 4 was good condition, with the free draining soils having minimal soil mottles within the topsoil layer.

- Mottles are also an indication of aeration and drainage and a warning sign that the soil is becoming, or is currently, damaged.

Earthworm Counts

The number of earthworms counted at each of the sites was low to moderate in the assessments. Given the wet conditions that were experienced at the time of completing the visit this may have had an influence on why they were not present in the soil assessment for any of the sites.

- Earthworms play an important role in decomposing and cycling organic matter, and in supplying nutrients to the plants. Earthworm numbers can decline if soils are waterlogged or if severe pugging occurs, which can result in long-term effects.

Surface Relief

The relief and surrounding conditions at the lower sites were of moderate condition, with visible pugging and in many places ponding water in the hoof prints. Soil # 4 was in good condition with a relatively smooth surface.

- Surface relief shows the severity of pugging severely under intensive grazing systems and indicates structural damage below the surface of the soil. This reduces the pores in the soil, which are important for water nutrient and air movement, and root penetration.

Soil # 1 - VSA	Soil # 1 Soil Auger
	

Figure 7a: Photos of soil auger observations

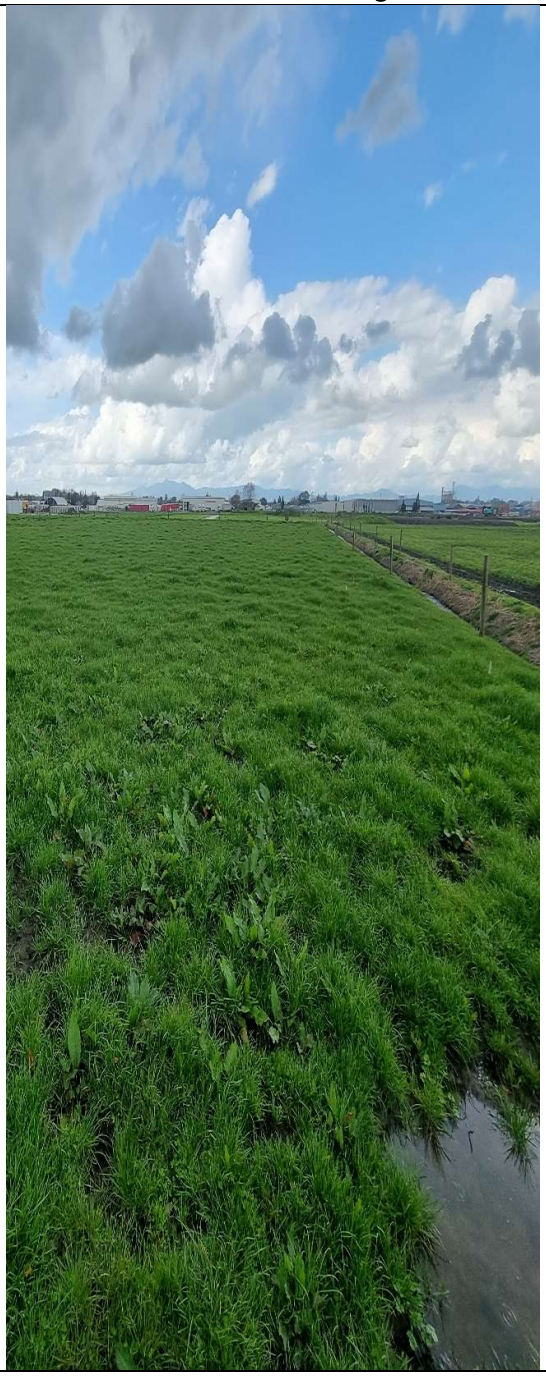
Soil # 2 - VSA	Soil # 2 Surroundings
	

Figure 7b: Photos of soil auger observations

Soil # 3 - VSA	Soil # 3 Soil Auger
	

Figure 7c: Photos of soil auger observations

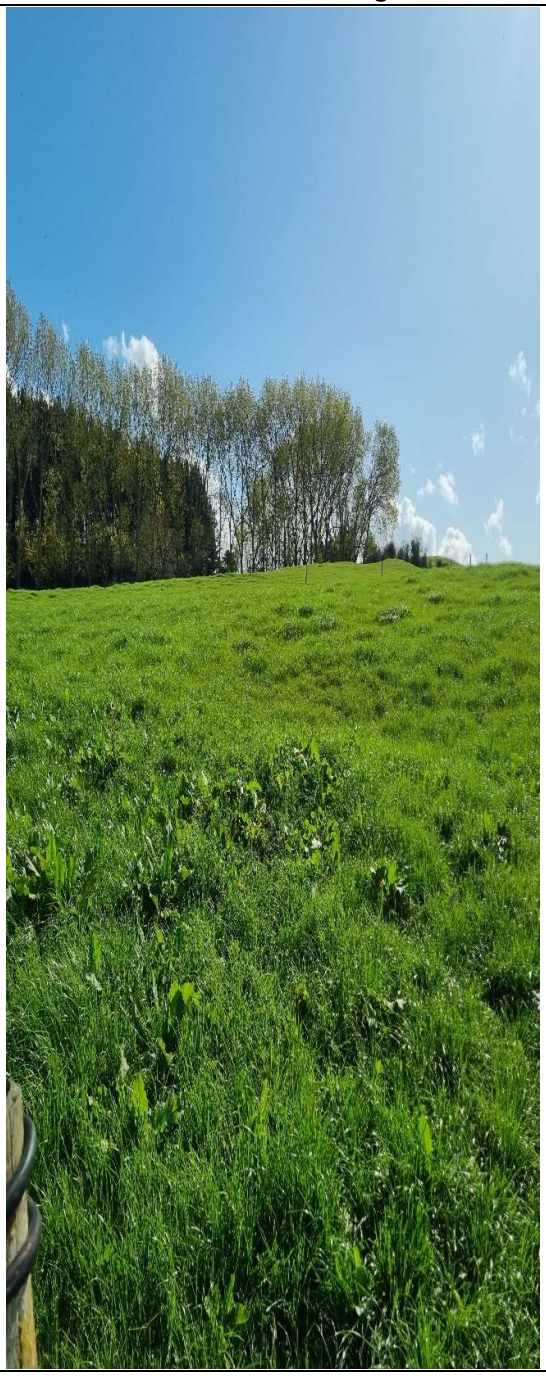
Soil # 4 - VSA	Soil # 4 Surroundings
	

Figure 7d: Photos of soil auger observations

5.2.2 Soil Sampling Results

AgFirst undertook soil sampling across some representative pastoral areas of the Site (Soil # 1 and Soil # 4 as presented on Figure 6). Based on the existing land use, these tests were carried out in accordance with the soil sampling procedure for dry stock farms. At each location, numerous core samples were taken of the topsoil down to 7.5 cm to obtain a representative sample, and analysed by Hill Laboratories - Soil Mixed Pasture, Drystock (Sed) (S186).

The results from the soil test analysis indicate that the macro nutrients are typically below and within the optimum levels when compared with the ranges for drystock farming on sedimentary soils. The results of the soil tests are presented in Table 4: Soil test results and summarised below. The full analysis is also included in Appendix B.

- pH – The pH levels for Soil # 1 are within the optimum requirements, while Soil # 4 is slightly below, requiring some lime to elevate the slightly acidic soils.
- Olsen P – The Olsen P levels at Soil # 1 are slightly above the optimum range, while Soil # 4 is well below the recommended levels, with drystock farms requiring an optimum Olsen P between 20-30. Soil # 4 would benefit from significant capital phosphorus fertiliser, even for a low stocked drystock farm.
- Potassium – Both soil samples returned results below the optimum range, requiring capital fertiliser to achieve recommended fertility.
- Sulphate Sulphur – This nutrient was not included in the chemical analysis.
- Magnesium – Both soil samples showed good magnesium fertility.

Table 4: Soil test results

Analysis	Soil # 1	Soil # 4	Recommended
Sample Depth (cm)	7.5	7.5	7.5
pH (pH Units)	5.8	5.6	5.8-6.0
Olsen Phosphorus (mg/L)	31	5	20-30
Potassium (MAF Units)	5	5	7-10
Sulphate Sulphur (mg/kg)	Not tested	Not tested	10-12
Magnesium (MAF Units)	22	13	8-10
Calcium (MAF Units)	9	3	N/A
Sodium (MAF Units)	7	8	N/A

The soil test results at Soil # 4 shows a depletion in the key nutrient levels Phosphorus (P), Potassium (K) and slightly acidic soils compared to optimum levels. The fertility at Soil # 1 was generally within the agronomic optimum f r this land use, with the exception of soil K levels being slightly below. Given the end use of the property (lowly stocked farm), while pasture production would be compromised, the optimum and recommended fertility levels will not be the same as the economic optimum due to the return on fertiliser costs etc. The key limiting factor is the P levels on the slopes to the north of the Site.

5.2.3 Manaaki Whenua – Landcare Research S-Map Database

To further understand the soils present across the property with regards to productive capacity, AgFirst has reviewed the Manaaki Whenua – Landcare Research S-Map database. While not sufficient to reclassify the soils as per the NPS-HPL, the S-Maps, also designed for use at a 1:50,000 scale, has a finer resolution achieved by incorporating the best available spatial information from soil surveys or new mapping, and has a much wider range of soil properties[8].

The distribution of the soils as mapped by S-Maps is presented in Figure 8 and Figure 9. The S-Maps more closely align with what was evident when visiting the Site, in particular the large area of poorly drained (typic orthic gley - Pukehina) soils to the north of the Site. While these soils are still likely to be considered HPL, the significant wetness limitations will impact the versatility and productive capacity of these areas. They have a restricted rooting depth of 60-80 cm and anoxic conditions (oxygen deficient) providing a rooting barrier. Essentially, more intensive and higher land uses (such as arable, horticulture and commercial vegetable operations) require free draining (or soils without rooting barriers) and relatively flat soils. The greater the wetness limitation, the more impact on yield and crop survival.

Given the wet early spring conditions, and recent rainfall events leading up to the site visit, some of the soils were at field capacity, as on the day of the visit some water logging was seen in areas of the proposed plan change area. This provided supporting evidence of the drainage capacity of the soils. The areas of waterlogging were located across the southern and low-lying portion of the Site, while the rolling land to the north was dry underfoot, confirming the S-Map database drainage classification.

The distribution of soils based on the S-Map representation, indicate that there are typic orthic gley soils to the south on the flats. These are silty clay soils with high water logging vulnerability. The soil is formed in layers of alluvium. The soil is poorly drained resulting from compact subsoil layers with slow permeability, which is suited to pastoral farming, but not suitable for horticultural crops susceptible to wet soil conditions[9].

The soils to the north of the block are largely typic orthic granular and mottled orthic brown soils, that are moderately well drained and imperfectly drained respectively. The Granular soil is formed in strongly weathered volcanic ash of the Hamilton ash formation. The soil is moderately well drained with moderately slow permeability, suited to pastoral farming, cropping and forestry. The brown soil is formed in clayey alluvium, with sands or gravel occurring below 60 cm from the surface. The soil is imperfectly drained with moderate to slow permeability, which is suited to pastoral farming, cropping and forestry[9]. However, although the soils are of high-class, due to the slope, most of these areas would not be suited to horticulture or arable purposes.

To support the S-Map representation, AgFirst has overlaid the WRC 1 m LIDAR contour over the Site. This is provided in Figure 10. The sloping area in the northern part of the Site consists of an area of approximately 4.6 ha, with ground level elevations ranging from RL29 m to RL 51 to the boundary of the Site.

[8] Hewitt AE (2010) New Zealand Soil Classification. 3rd ed. Landcare Research Science Series No. 1. Lincoln, Manaaki Whenua Press

[9] www.nzsoils.org.nz

5.2.4 Modified and Anthropic Soils

Under the New Zealand Land Resource Inventory (NZLRI), 13.1 ha of the Site is classified as HPL (Land Use Capability (LUC) 2), with 0.3 ha of non HPL Land (LUC 4). However, The NZLRI LUC does not take into account unproductive areas, such as existing buildings, tracks and modified soils. Specific to this Site is a farm track that extends the length of property and provides access to each paddock, and stock yards and ancillary sheds to the south of the property, and the recently completed construction earthworks to the north of the Site.

The earthworks which have occurred in the northern part of the Site have had a significant impact on the versatility of the soils due to the topsoil being removed, replaced, buried and compacted. The soils are now heavily modified and are classified as anthropic soils[10]. These areas are appropriately considered non-productive land, are not suitable for cultivation and arable use due to the soil limitations and are not HPL. Once unproductive areas have been accounted for, the HPL area remaining is approximately 7.9 ha across the PPC58 Site. This area is shown with red shading on Figure 2.

The New Zealand Soil Classification system provides the definition and criteria for Anthropic Soils:

Anthropic Soils are soils that have been made by the direct action of people, including truncation of natural soils by earth-moving equipment, drastic mixing of natural soils so that their original character is lost, or by deposition of thick layers of organic or inorganic material. Anthropic Soils occur in land surfaces that are made by people. Their classification reflects the way in which they were made and the kinds of materials used.

While the earthworks area will be re-established back into pasture in the short-term, the structure of the soils and in the absence of a well-defined A horizon and subsoil development, a Land Use Capability class and unit cannot be assigned. Therefore, they will not be classified as LUC 1 – 3 soils or HPL. While still suitable for pastural grazing, these areas will have limited versatility and productive capacity.

[10] Hewitt AE (2010) New Zealand Soil Classification. 3rd ed. Landcare Research Science Series No. 1. Lincoln, Manaaki Whenua Press

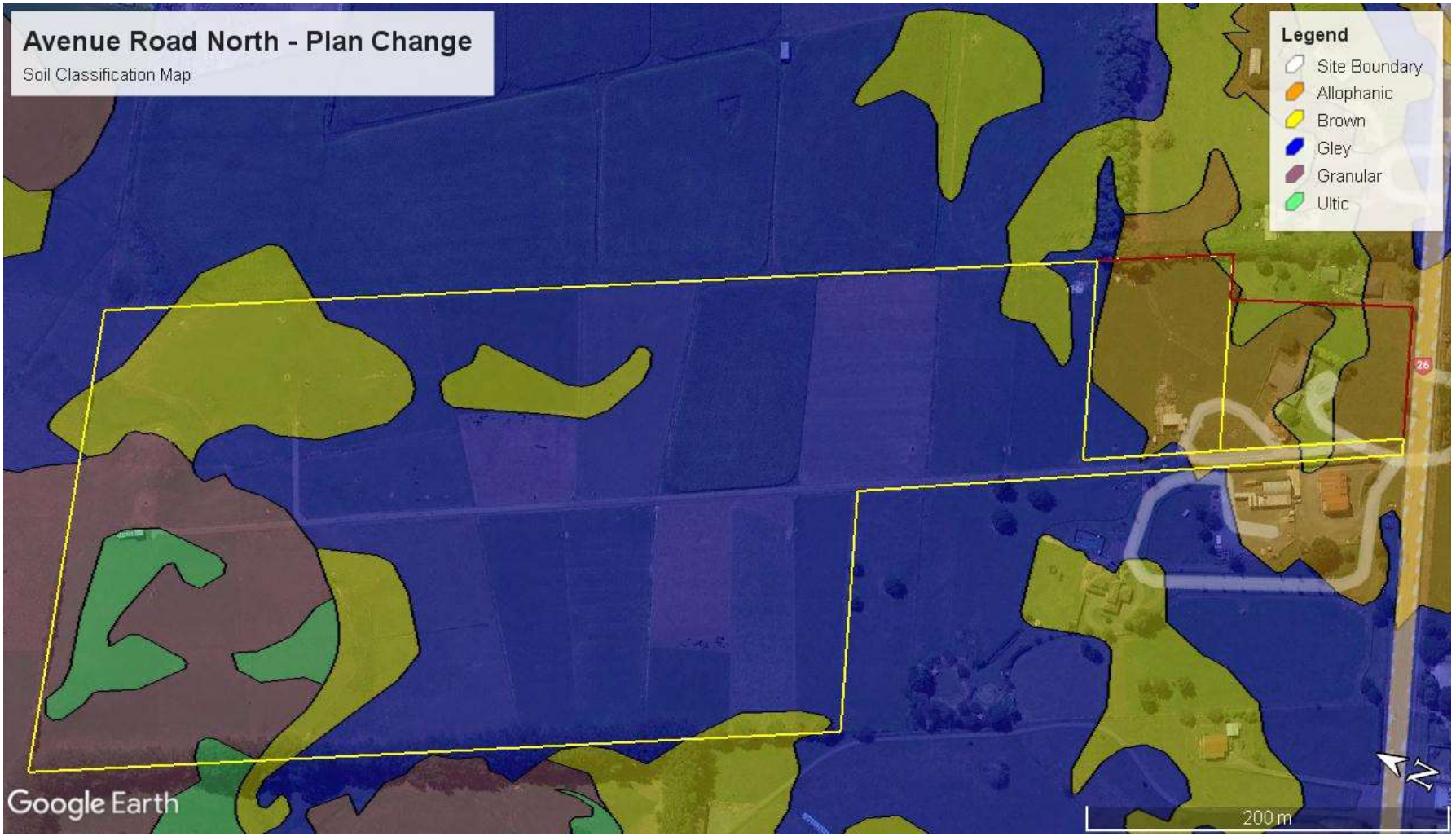


Figure 8: Soil classification representation of the Site

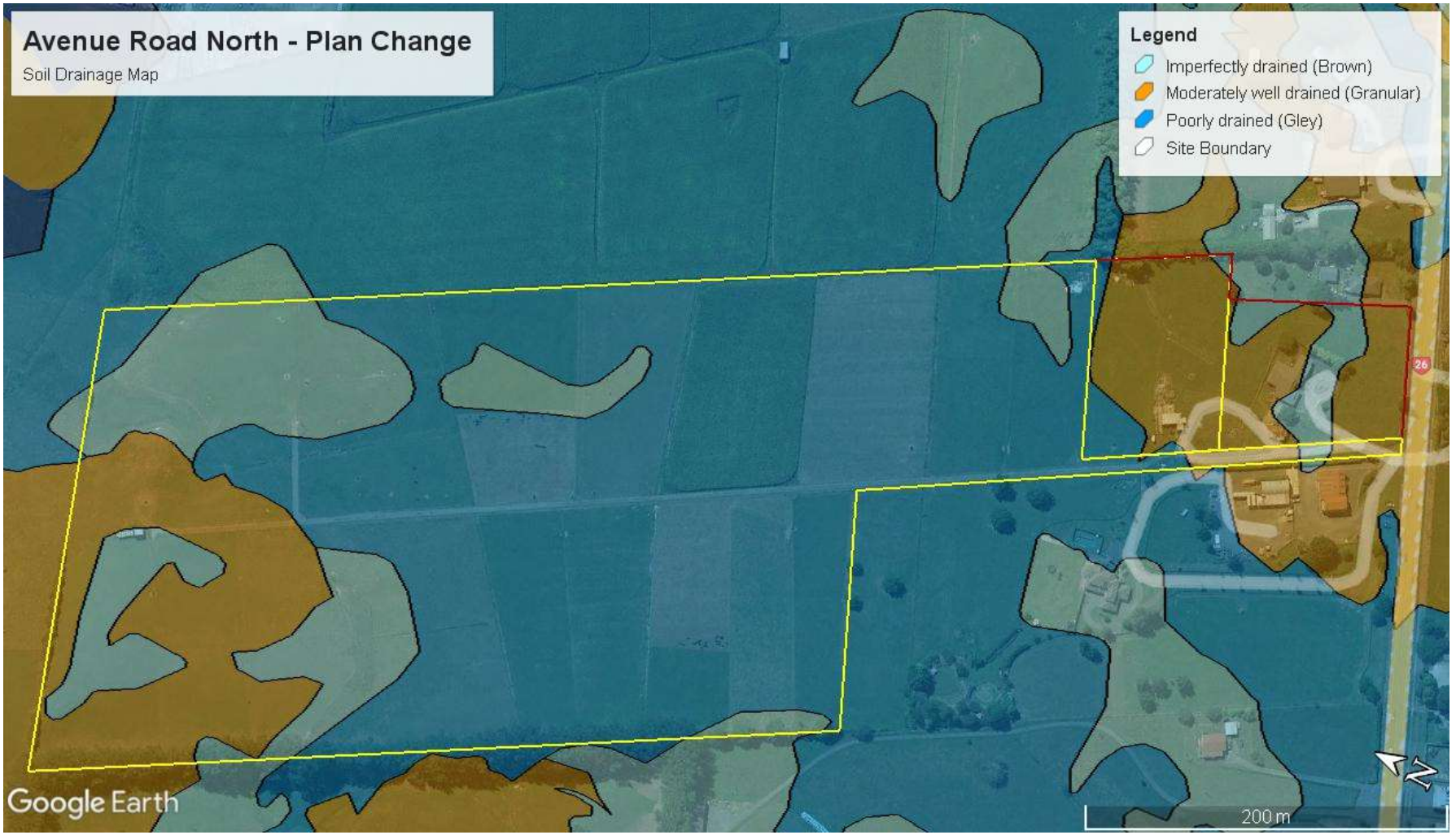


Figure 9: Soil drainage representation of the Site

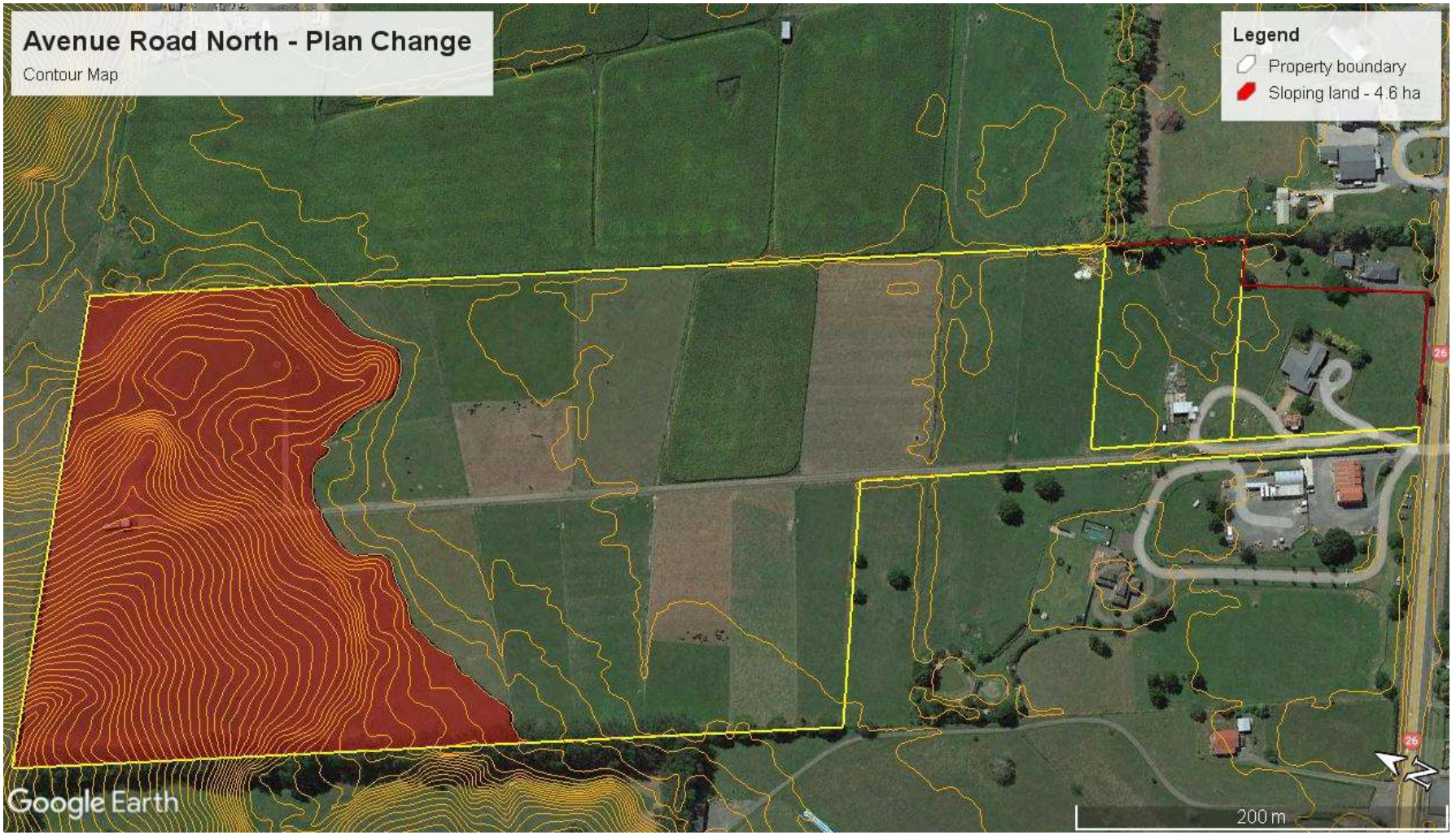


Figure 10: LIDAR contour representation of the Site

As discussed in Section 3 and Section 5.2.4, there is a large area to the north that has been used for recent earthworks. Due to the earthworks modifications, these soils have been reclassified as anthropic and modified soils, which are not HPL. This along with other unproductive areas reduces the effective HPL area to 7.9 ha. This is presented in Figure 11.

The key limitations for land-based primary production and versatility on the Site are:

- Lack of size
- Poor draining soils on the lower terrace
- Sloping land and modified soils to the north
- Inability to achieve scale through neighbouring farms, due to land use change restrictions
- Neighbouring land to the east and south-east zoned industrial and business
- Non-reversable land fragmentation to the south and west

The lack of size and scale will remove any likelihood of investing into infrastructure or machinery if there was a desire to intensify or change the production type within the Site. The soil types do not lend themselves to any horticultural, commercial vegetable production or arable land uses. As discussed, the wetness limitations will impact crop yield and crop survival, with pugging vulnerability for heavier stock classes. The steeper areas may not be suitable for cultivation, with elevated soil erosion risks and not being tractor navigable. In addition, the earthworks area, while to be re-instated back into pasture in the short-term, will no longer have the same soil structure and plant rooting depth potential. Therefore, this area will be limited in land use versatility, with production types only suited to pastural grazing systems.

There are higher returns for some of the alternative pastoral grazing operations, including dairy heifer grazing, a dairy support runoff, or leasing/incorporating into the neighbouring dairy operation. However, all off these options are considered intensification, based on subpart 2 of the National Environmental Standards for Freshwater (NES-FW) released in 2020. This legislation requires a land use change discretionary activity consent when converting land into dairy or dairy support, pending the baseline land use at the time of the reference period. For consent to be granted, the enterprise must demonstrate that the proposed land use does not have any more impact on the catchment than during the baseline year. For this Site, that baseline was a lowly stocked beef operation, therefore of relatively low environmental impact (nutrient losses) to the receiving environment and catchment, and success of this type of consent would be low. Therefore, the highest and best farming use of the land remains as a lowly stocked pastural grazing block.

While 7.9 ha of the Site is considered HPL, which identifies it as being versatile for a range of productive uses, AgFirst does not consider that horticulture is a reasonably practicable option for the Site. With the soils on the lower terrace being poor draining gley soils, this will have an impact with some crops not surviving, while others will have reduced yields[11].

There is also the issue of sensitive receptors, given the development immediately surrounding the Site. With horticultural activities, there are issues with spray drift and noise from frost protection, while dust can be an issue for arable operations following cultivation and harvest

[11] Lynn, I.H, Manderson, A.K, Page, M.J, Harmsworth, G.R, Eyles, G.O, Douglas, G.B, Mackay, A.D, Newsome, P.J.F. (2009). Land Use Capability Survey Handbook – a New Zealand handbook for the classification of land 3rd ed. Hamilton, AgResearch; Lincoln, Landcare Research; Lower Hutt, New Zealand. GNS Science.

events. Investment into intensive agricultural operations with adjoining business and residential zones and activities is a risk.

With rapidly rising input costs, the returns for marginal farming operations will be reduced, and consideration will need to be given regarding the optimum land use for the Site. Having undertaken chemical analysis within the pastoral areas, there appears to be a nutrient deficiency on some of the soils, however, this can be actively managed and rectified. Although, with the existing land use, being a lowly stocked beef block, this may not be economically viable. When discussing the long-term productivity of the site, it is highly unlikely that this Site will be used for land-based primary production, as it is not currently economically viable.

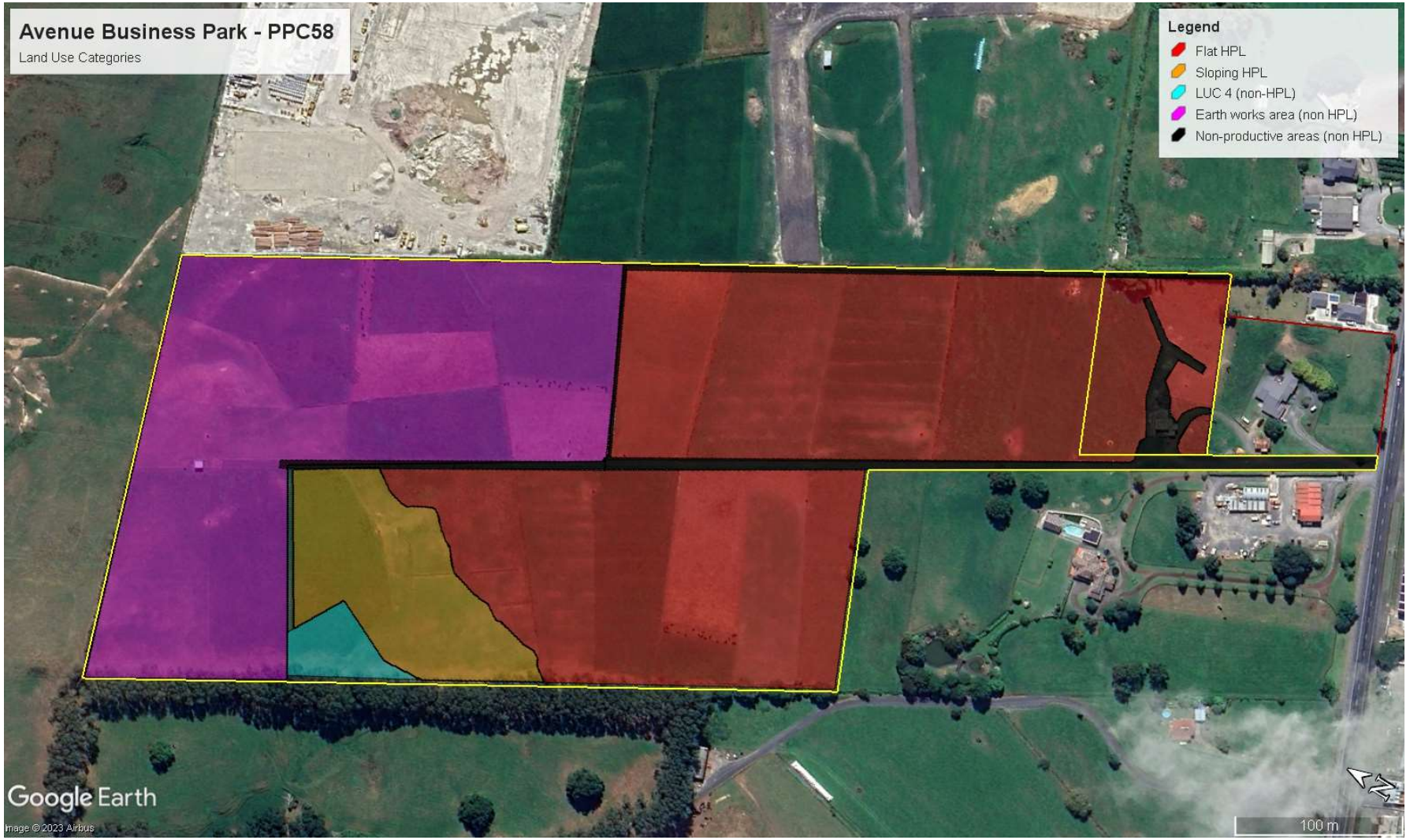


Figure 11: Land use categories of the Site

7.0 ASSESSMENT OF ALTERNATIVE INDUSTRIAL ZONES IN THE LOCALITY

This section provides an analysis of potential expansion of alternative industrial areas within Morrinsville in response to clause 3.6(4)(b) of the NPS-HPL which requires consideration of other practicable and feasible options for providing the required development capacity.

With regards to LUC classes within the district, there is an estimated 114,658 ha of HPL within the Matamata-Piako district[12], which is 65% of the total area. The LUC breakdown for the district is presented in Figure 12. This represents a significant proportion of the district, which inherently surrounds many of the rural satellite towns such as Morrinsville. This makes any development, land use change or rezoning a challenge, where consideration of the NPS-HPL will be required. Therefore, it is important to balance out the demand and need for urban rezoning and selection of appropriate areas that will have less impact and preferably consists of areas with lower productive capacity or constraints for future land-based primary production.

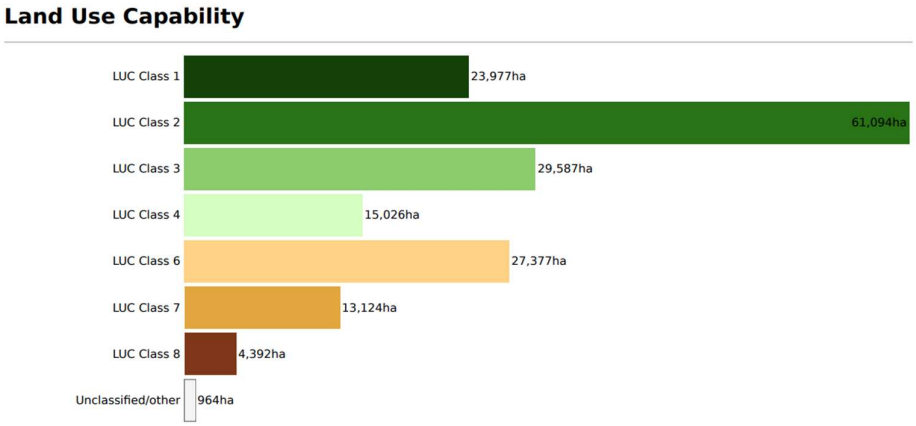


Figure 12: Summary of Land Use Classification within the Matamata-Piako District

AgFirst has assessed land surrounding other Industrial zoned areas in Morrinsville with regards to productive capacity to determine whether there are any other reasonably practicable and feasible options for providing additional development capacity (i.e. are there already areas surrounding industrial zones that are not on highly productive land or with a lower productive capacity than the assessment Site). Other than the Industrial zoned area surrounding Avenue Road North, AgFirst has identified two existing industrial zones within and surrounding Morrinsville. These are presented in Figure 13.

This comparative assessment has taken into account a range of characteristics, which are relevant to the relative productive potential including:

- Size of growth cell and expansion opportunity
- Current and surrounding land use
- NZLRI LUC classification, soil characteristics and drainage
- Environmental constraints and risk
- Economic limitations arising from small, fragmented portions of land and its productive potential

[12] Manaaki Whenua – Landcare Research. Our Environment, Territorial Authorities, Waikato District LUC map.

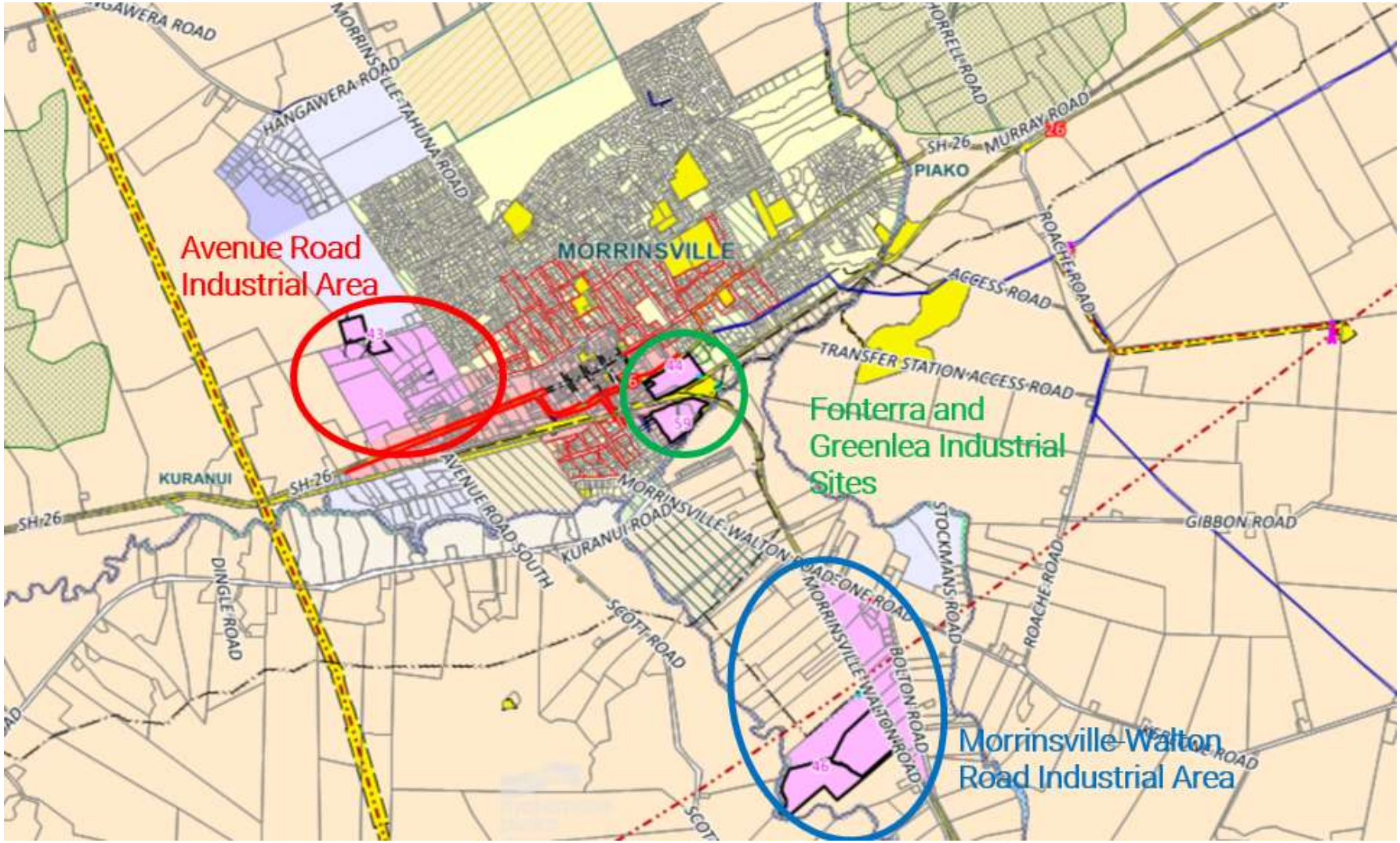


Figure 13: Morrinsville industrial zone locations

7.1 Fonterra and Greenlea Industrial Sites

The Fonterra and Greenlea industrial sites are located on the southern boundary of Morrinsville town. Due to the zoning and surrounding areas, there is very limited potential for expansion of industrial activity in this area, as the effective area is already developed. The adjacent areas to the west and north are zoned business, to the east zoned residential and the land in between the Fonterra and Greenlea sites is designated east coast trunk railway.

The only rural land available for expansion within the vicinity of this industrial area is to the south and southeast. However, this is separated from the industrial sites and constrained by a gully system, waterways and native bush, providing limited connectivity to the industrial development. The gully area consists of steep contour and imperfectly drained soils. The surrounding rural soils to the south and east are typic orthic allophanic, free draining soils (Figure 14) which are flat to undulating. The NZLRI LUC representation for the surrounding area (Figure 15) shows the gully to be LUC 3w, with productive areas either LUC 1s or LUC 2e. The land to the south within the Rural Zone contains approximately 18 dwellings along Eynon Road. Land beyond the Eynon Road residential area is used for pastural grazing and appeared to once be an equine riding arena. These soils are classified as the most versatile soils and is supported by the S-Maps classification, as being free draining. The land to the east is used for arable cropping, and due to the highly versatile soils, large contiguous area and limited constraints, could potentially be used for alternative horticulture and commercial vegetable cropping.

Therefore, the adjacent land areas are considered unsuitable for expansion due to the gully system, while the areas beyond the gully that are not in residential use are much more versatile with a higher productive capacity compared to the assessment Site. The versatility of this rural area also presents better access to supporting primary industries, with an established blueberry farm (Maungatapu), arable cropping and dairy farms in the vicinity of the Site.

Expansion opportunity	Limited or not suitable
Constraints	Gully, waterway, steep sloping area and business/residential zoning
Current land use	Industrial zone
Surrounding land use	Business Zone (west and north) Residential zone (north and east) Rural Zone (south and east) – unproductive gully, residential dwellings along Eynon Road, pastural grazing, arable cropping, blueberry farm and dairy farm
NZLRI LUC classification	LUC 1, LUC 2 and LUC 4
Soil characteristics	Majority of surrounding area is well drained soils
Environmental constraints	Gully, waterways and steep area
Economic limitations	Surrounding business and residential zones and dwellings along Eynon Road
Land use potential	Potential for dairy, pastural grazing, arable, horticultural, berry or commercial vegetable operations with established high value crops
Comparison to PPC58	In the vicinity of the Fonterra and Greenlea Industrial Sites, the land has a much higher productive capacity compared to the PPC58 Site. This is due to the modified soils due to earthworks which have occurred on the PPC58 Site, the poor

	draining nature of the PPC58 Site and non-reversable land fragmentation which limits productive capacity. The soils to the south of the Fonterra and Greenlea Industrial Sites are much higher quality with established productive systems offering higher versatility and land use options.

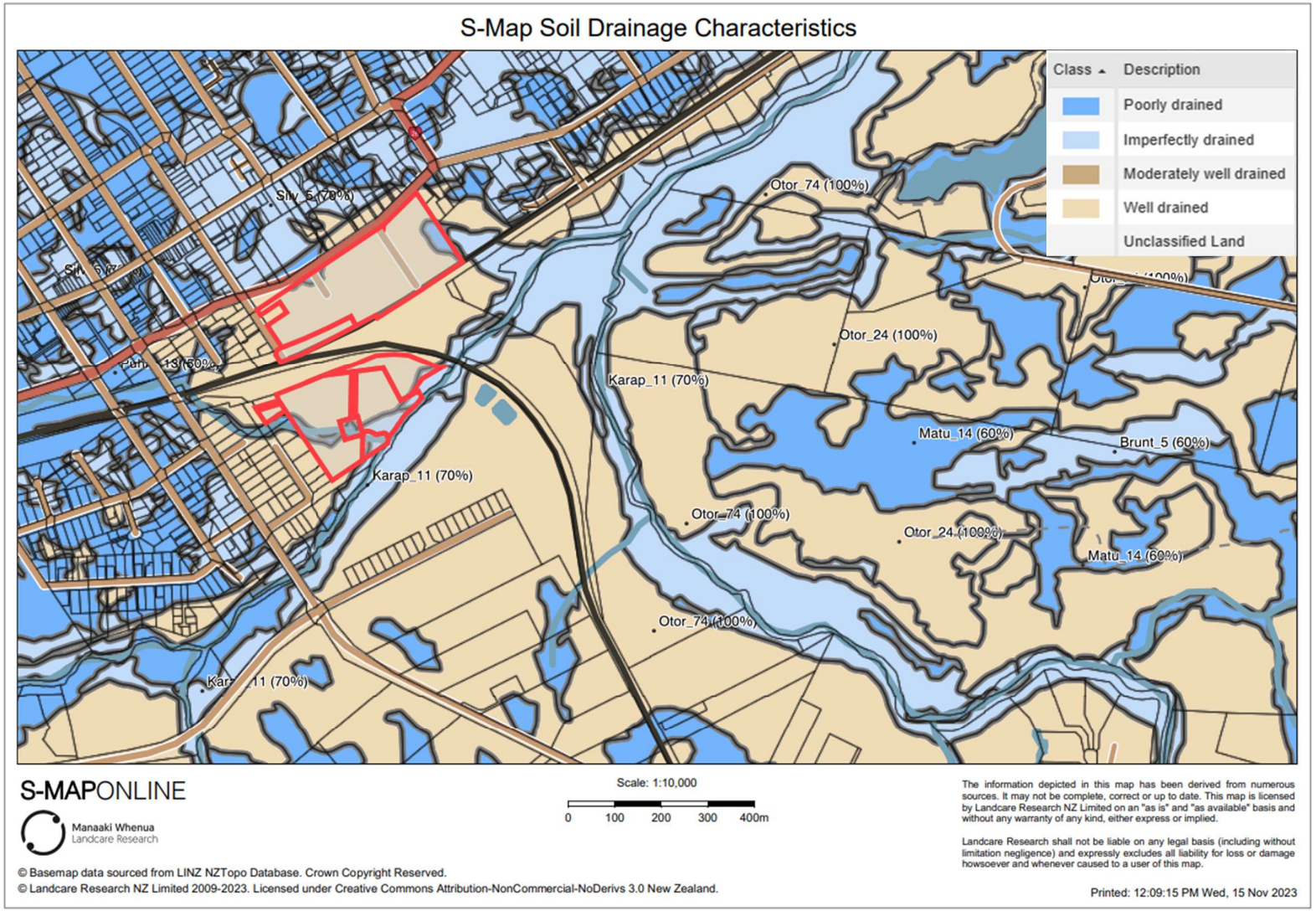


Figure 14: S-Map representation of land surrounding Fonterra and Greenlea industrial sites

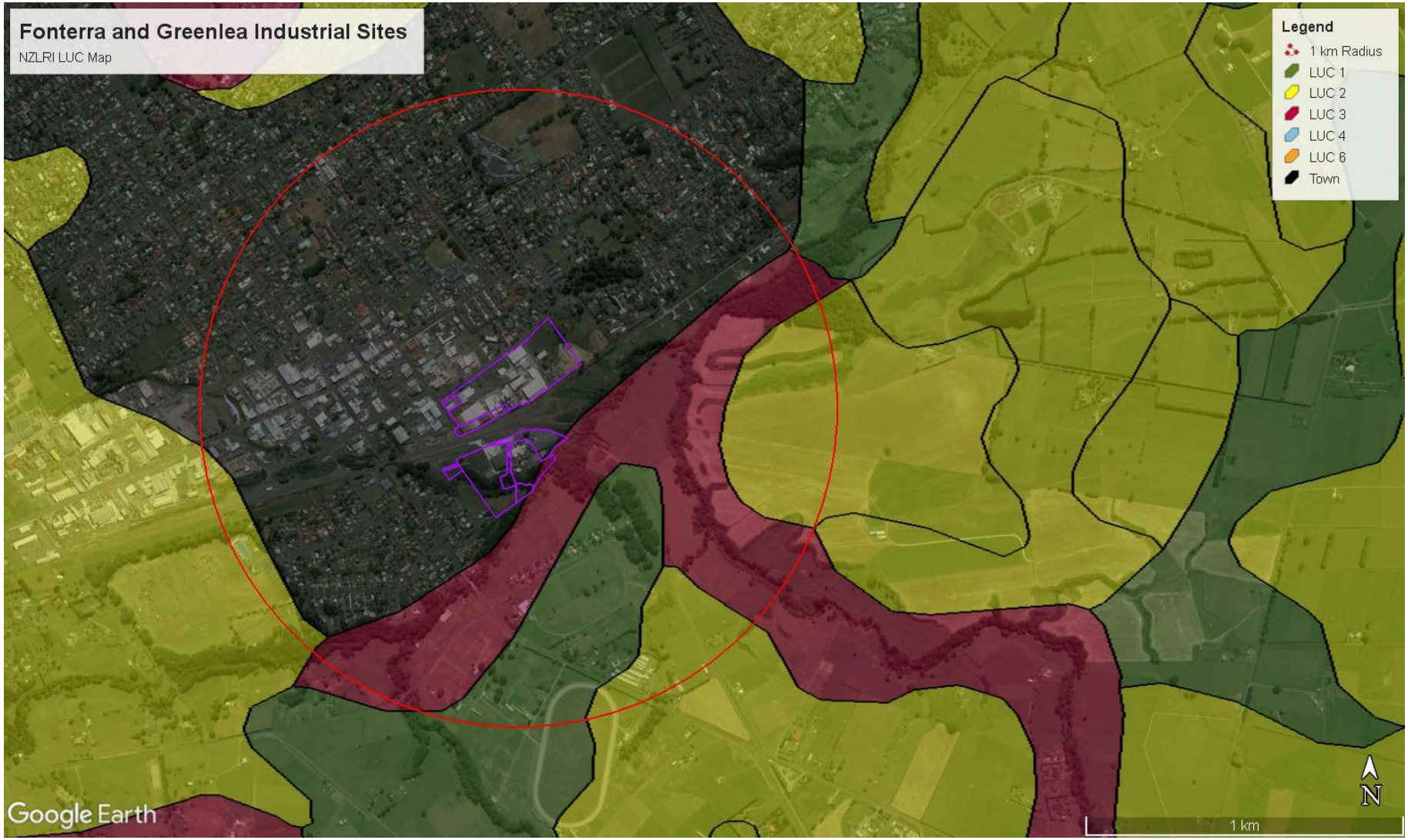


Figure 15: Fonterra and Greenlea industrial area NZLRI LUC classification

7.2 Morrinsville-Walton Road Industrial Area

The Morrinsville-Walton Road industrial area is approximately 50 ha, located on the Morrinsville-Walton Road, approximately 1.5 km to the southeast of Morrinsville town. This industrial area is surrounded in its entirety by rural zoning, with limited physical constraints for potential expansion.

The surrounding rural soils are poorly drained typic orthic gley (Temuka) and imperfectly drained mottled orthic brown (Figure 16Figure 14) which are flat to undulating. The poor draining Temuka soils are described as a soil that has unlimited rooting depth with no significant barriers within 1 m. The NZLRI LUC representation for the surrounding areas (Figure 17Figure 15) shows the pastural areas to be LUC 1s, LUC 2s, LUC 2e, LUC 2w, LUC 3e and LUC 3w (all HPL land). The land uses are predominantly used as intensive dairy support heifer grazing and frequent maize rotations.

Therefore, the adjacent land areas are considered more versatile than the areas surrounding the PPC58 Site, with a higher productive capacity, which contain larger contiguous areas with fewer constraints. The versatility of this rural area also presents better access to supporting primary industries, with arable cropping, dairy support and dairy farms in the vicinity of the Site. With the current land use in dairy support, there are also less land use change restrictions, with the ability for more productive systems and amalgamate with other dairy support or dairy grazing operations without requiring resource consent.

Expansion opportunity	Unlimited
Constraints	None
Current land use	Industrial zone
Surrounding land use	Rural Zone – pastural grazing, dairy support and arable cropping,
NZLRI LUC classification	LUC 1, LUC 2 and LUC 3 (all HPL)
Soil characteristics	Majority of surrounding area is poorly drained and imperfectly drained
Environmental constraints	None
Economic limitations	None
Land use potential	Potential for pastural grazing, arable, horticultural, berry or commercial vegetable operations with established high value crops
Comparison to PPC58	In the vicinity of the Morrinsville-Walton Road industrial area, the land has a much higher productive capacity compared to the PPC58 Site. This is due to the modified soils due to earthworks which have occurred on the PPC58 Site, the poor draining nature of the PPC58 Site and non-reversable land fragmentation which limits productive capacity. While much of the soils surrounding the Morrinsville-Walton Road Industrial Area contain poor and imperfectly draining soils, they have less rotting barriers than the soils present on the PPC58 Site. The larger productive areas surrounding this Site also provides for more versatility, compared to the fragmented and small PPC58 Site. There are also more alternative production systems available at the Morrinsville-Walton area due to fewer consent restrictions.

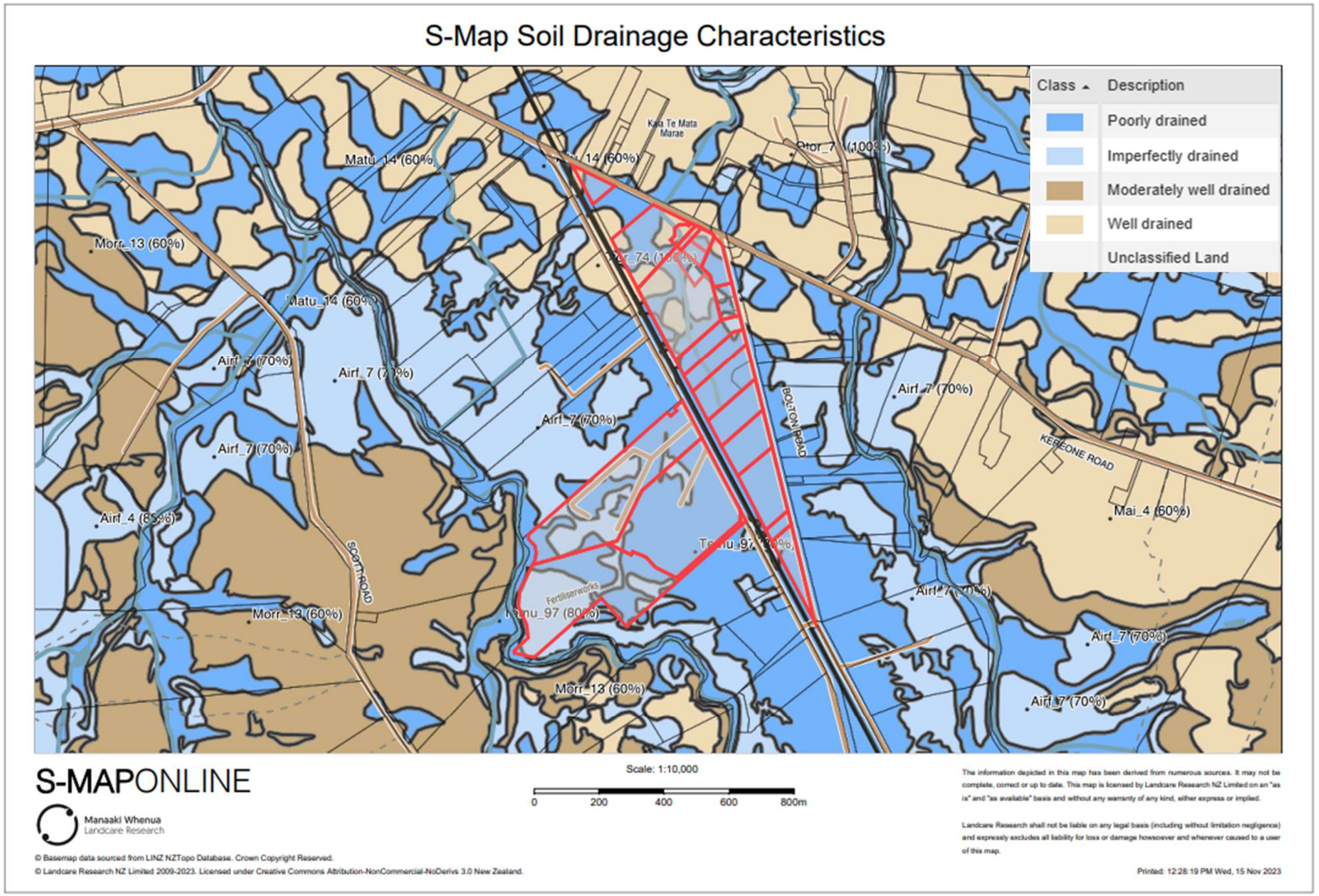


Figure 16: S-Map representation of land surrounding Morrinsville-Walton Road industrial area

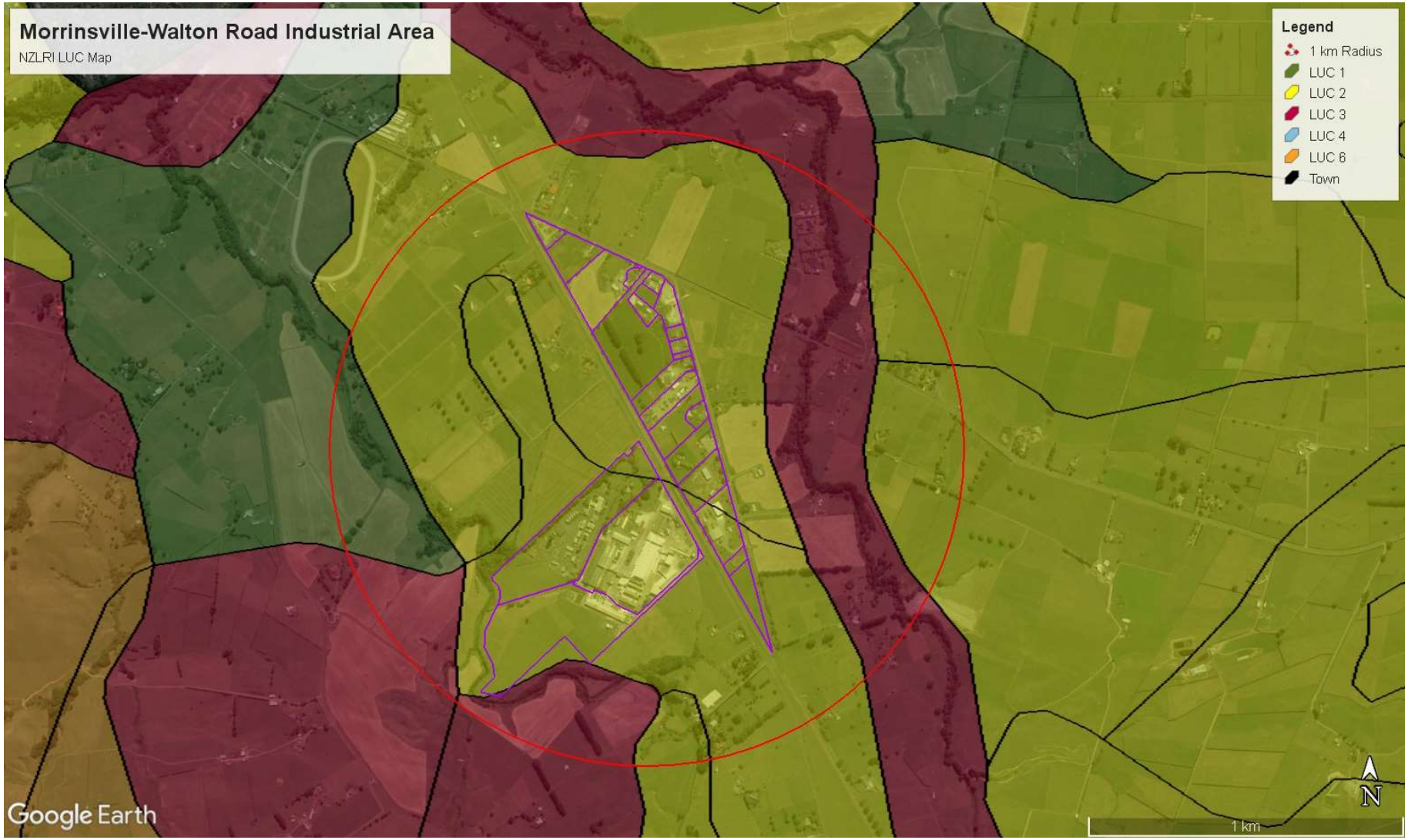


Figure 17: Morrinsville-Walton Road industrial area NZLRI LUC classification

8.0 SUMMARY

Overall, while approximately 7.9 ha of the PPC58 Site is identified as HPL under the NPS-HPL (LUC 2), the practical likelihood of any sustained existing or intensive agricultural operation would be restricted due to:

- The limited productive capacity of the Site, with the highest and best farming use being low intensity pastural grazing. Using reasonably practicable sense, AgFirst considers pastoral grazing to be the highest and best use of the land for land-based primary production.
- The small scale of the Site, exacerbated further by the earthworks which have recently occurred. Only 7.9 ha of the Site remains as HPL.
- The modified soils will limit the versatility and productive capacity of the earthworks area to pastural only production systems.
- The wetness limitation of the soils across the remainder of the Site (poorly drained) also limit the versatility of the Site. This will make the land unsuitable for most agricultural and horticultural operations, without significant land management strategies.
- The inability to amalgamate the Site with surrounding land uses to improve versatility because of:
    - National regulations (NES-FW) would be likely to restrict intensification of the site to convert it to dairying. This, as well as the high value of the land, would preclude amalgamation of the Site into the dairy farm which is located to the north.
    - The Industrial zoning of the land to the east which is already being developed.
    - Small, fragmented land parcels to the south and west.
    - The Business zoning of land to the south-east.
    - State Highway 26 to the south.

Given the constraints identified above, and a comparison against alternative options for expansion of other industrial zones within and surrounding Morrinsville, it is evident that PPC58 Site has less HPL and a lower relative productive capacity. Therefore, AgFirst believes that the re-zoning of the PPC58 Site meets the requirements of Clause 3.6(4)(b) of the NPS-HPL insofar as there are no other reasonably practicable and feasible options which are better suited in terms of impacts on productive land for providing additional industrial development capacity in Morrinsville.

Furthermore, the costs of the loss of the PPC58 Site due to the proposed urban rezoning will be low. The productive nature of the Site is already significantly compromised due to the earthworks which have occurred for Stage 1 of the Avenue Business Park and due to the other limitations with the Site which are referred to above. AgFirst does not consider that the loss of the well below average productivity from this Site will have a significant loss on the district's production, and the conversion of the land into GIZ would not cause any fragmentation or further disruption of additional highly productive land.

APPENDIX A: ECONOMIC ANALYSIS FOR PRIMARY PRODUCTION

2581 State Highway 26 Property Information and Liabilities ERROR! NOT A VALID LINK.

Legal description	Land value	value per ha	Area (ha)	Rates	Debt servicing	Total liabilities
Lot: 1 DPS: 78100	$ 550,000	$ 342,146	1.6075	$ 3,248	$ 15,400	$ 11,601
Lot: 2 DPS: 78100	$ 1,050,000	$ 82,970	12.6552	$ 2,789	$ 29,400	$ 2,544

2581 State Highway 26 Property Economic Viability

Scenario	Current Land-based primary production			Highest/Best land-based primary production		
	Production type	Total income	Net profit/loss	Production type	Total income	Net profit/loss
PPC58 Site	Pastural grazing	$ 11,287	-$ 39,550	Pastural grazing	$ 11,287	-$ 39,550

Beef + Lamb New Zealand Economic Service

4/09/2023 10:07 am

Beef + Lamb New Zealand Economic Service

Sheep and Beef Farm Survey - $ Per Hectare Analysis

Class 5 N.I. Finishing - New Zealand

30-09-22

Notes tab

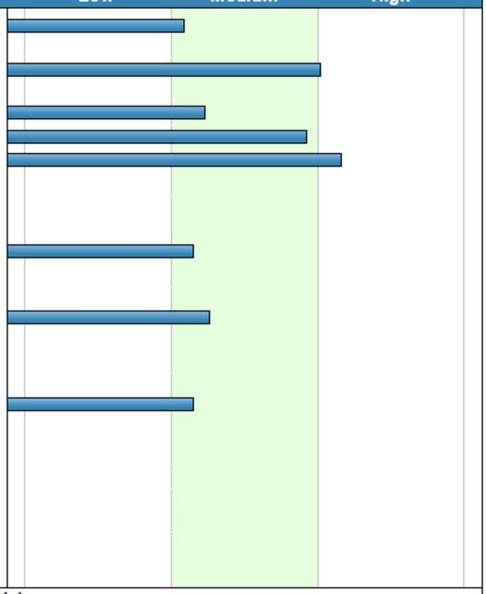
		2019-20	2020-21	Provisional 2021-22	B+LNZ 2022-23	Forecast With interest & rates 2022-23	Without interest & rates 2022-23
	Revenue Per Hectare						
1	Wool	25.67	19.41	27.50	28.21	28.21	28.21
2	Sheep	558.12	475.04	623.57	584.29	584.29	584.29
3	Cattle	770.92	659.49	925.36	903.57	903.57	903.57
4	Dairy Grazing	60.55	93.77	79.29	90.00	90.00	90.00
5	Deer + Velvet	-0.21	-0.04				
6	Goat + Fibre	0.34	0.31	0.10	0.10	0.10	0.10
7	Cash Crop	173.69	151.45	168.57	184.29	184.29	184.29
8	Other	87.78	99.30	100.26	107.76	107.76	107.76
9	**Total Gross Revenue**	**1676.86**	**1498.73**	**1924.64**	**1898.21**	**1898.21**	**1898.21**
	Expenditure Per Hectare						
10	Wages	84.53	89.01	91.12	95.38	95.38	95.38
11	Animal Health	51.03	52.96	54.56	58.06	58.06	58.06
12	Weed & Pest Control	17.61	19.15	20.95	24.39	24.39	24.39
13	Shearing Expenses	35.80	37.84	38.06	39.40	39.40	39.40
14	Fertiliser	151.72	141.89	176.48	189.27	189.27	189.27
15	Lime	9.39	10.69	11.98	18.12	18.12	18.12
16	Seeds	31.84	37.81	39.10	38.77	38.77	38.77
17	Vehicle Expenses	43.11	48.13	51.04	53.33	53.33	53.33
18	Fuel	32.33	31.12	35.69	37.03	37.03	37.03
19	Electricity	12.72	13.17	13.50	14.14	14.14	14.14
20	Feed & Grazing	85.46	76.20	81.81	79.10	79.10	79.10
21	Irrigation Charges	2.02	1.16	1.16	1.16	1.16	1.16
22	Cultivation & Sowing	27.28	27.08	28.48	28.29	28.29	28.29
23	Cash Crop Expenses	19.52	20.31	21.81	17.84	17.84	17.84
24	Repairs & Maintenance	93.53	111.40	125.59	126.67	126.67	126.67
25	Cartage	25.58	30.47	31.55	32.62	32.62	32.62
26	Administration Expenses	42.28	47.40	48.78	49.80	49.80	49.80
27	**Total Working Expenses**	**773.11**	**805.62**	**871.65**	**903.36**	**903.36**	**903.36**
28	Insurance	24.13	24.08	24.73	25.51	25.51	25.51
29	ACC Levies	4.93	10.65	11.01	11.41	11.41	11.41
30	Rates	49.69	51.14	54.36	55.54	859.3	
31	Managerial Salaries	3.43					
32	Interest	120.51	114.27	102.85	106.61	3969.2	
33	Rent	40.12	39.76	41.54	42.31	0.00	
34	**Total Standing Charges**	**242.82**	**239.90**	**234.49**	**241.38**	**4865.42**	**36.92**
35	**Total Cash Expenditure**	**1015.93**	**1045.51**	**1106.15**	**1144.74**	**5768.78**	**940.28**
36	Depreciation	79.32	82.54	89.21	89.69	89.69	89.69
37	**Total Farm Expenditure**	**1095.25**	**1128.06**	**1195.36**	**1234.29**	**5858.47**	**1029.97**
38	**Farm Profit before Tax**	**581.61**	**370.67**	**729.29**	**663.93**	-3960.26	868.24

Certificate of Analysis

Client:	AgFirst Waikato (2016) Limited	**Lab No:**	3081760 shvpv1
Address:	PO Box 9078 Hamilton 3240	**Date Received:**	22-Sep-2022
		Date Reported:	29-Sep-2022
		Quote No:	
		Order No:	
		Client Reference:	Steffert
Phone:	07 839 2683	**Submitted By:**	Jeremy Hunt

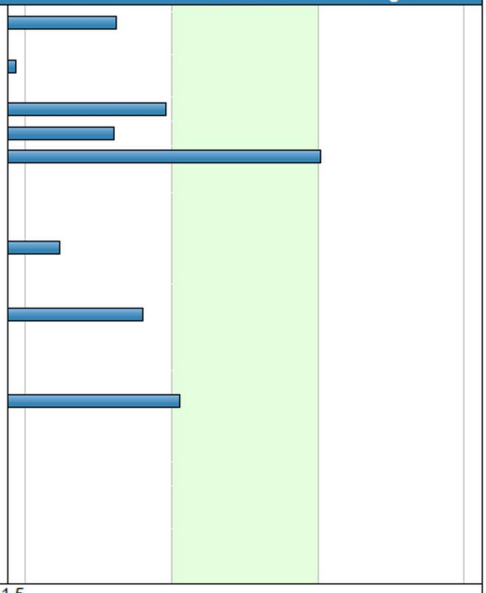
Sample Name: #1 Steffert **Lab Number:** 3081760.1
Sample Type: SOIL Mixed Pasture, Dry Stock (Sed.) (S186)

Analysis		Level Found	Medium Range*
pH	pH Units	5.8	5.8 - 6.2
Olsen Phosphorus	mg/L	31	20 - 30
Potassium	me/100g	0.32	0.30 - 0.40
Calcium	me/100g	9.6	4.0 - 10.0
Magnesium	me/100g	1.31	0.40 - 0.60
Sodium	me/100g	0.21	
CEC	me/100g	20	
Total Base Saturation	%	58	55 - 75
Volume Weight	g/mL	0.73	
Potentially Available Nitrogen (15cm Depth)*	kg/ha	176	150 - 250
Anaerobically Mineralisable N*	µg/g	160	
Organic Matter*	%	8.5	7.0 - 17.0
Total Carbon*	%	5.0	
Total Nitrogen*	%	0.41	
C/N Ratio*		12.2	
Anaerobically Mineralisable N/Total N Ratio*	%	3.9	
Soil Sample Depth*†	mm	0-75	
Soil Type*†		Sedimentary	
Base Saturation %		K 1.6 Ca 49	Mg 6.7 Na 1.1
MAF Units		K 5 Ca 9	Mg 22 Na 7



Sample Name: #4 Steffert **Lab Number:** 3081760.2
Sample Type: SOIL Mixed Pasture, Dry Stock (Sed.) (S186)

Analysis		Level Found	Medium Range*
pH	pH Units	5.6	5.8 - 6.2
Olsen Phosphorus	mg/L	5	20 - 30
Potassium	me/100g	0.30	0.30 - 0.40
Calcium	me/100g	3.2	4.0 - 10.0
Magnesium	me/100g	0.69	0.40 - 0.60
Sodium	me/100g	0.20	
CEC	me/100g	14	
Total Base Saturation	%	32	55 - 75
Volume Weight	g/mL	0.82	
Potentially Available Nitrogen (15cm Depth)*	kg/ha	131	150 - 250
Anaerobically Mineralisable N*	µg/g	106	
Organic Matter*	%	7.6	7.0 - 17.0
Total Carbon*	%	4.4	
Total Nitrogen*	%	0.38	
C/N Ratio*		11.7	
Anaerobically Mineralisable N/Total N Ratio*	%	2.8	
Soil Sample Depth*†	mm	0-75	
Soil Type*†		Sedimentary	
Base Saturation %		K 2.1 Ca 23	Mg 5.0 Na 1.5
MAF Units		K 5 Ca 3	Mg 13 Na 8



Contact

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