Figure 1: The site (outlined in red) and surrounding land uses

1.2 Land Use Capability

Figure 2 is a screenshot from the New Zealand Land Resources Inventory Series (LRIS) Land Use Capability Portal[3] The site consists of 25 ha of LUC 2 land and 3 ha of unclassified land.

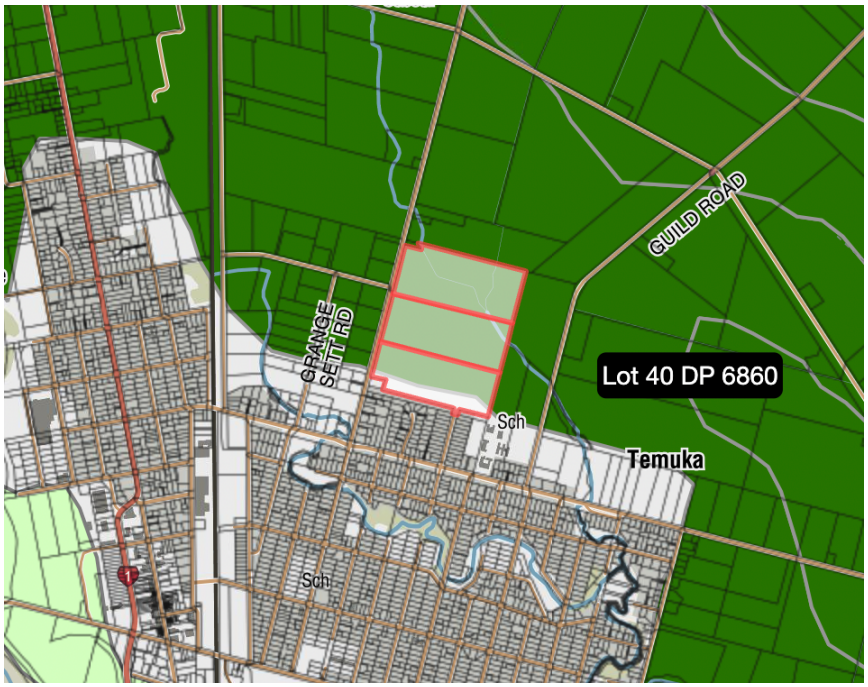

Figure 2: LUC Class of the Site

In the NPS-HPL all land designated as LUC1, 2, and 3 in the LRIS mapping is deemed to be highly productive land until it is remapped at a finer scale by the Regional Council and the maps included in the Regional Policy Statement.

[3] https://ourenvironment.scinfo.org.nz/maps-and-tools/app/Land%20Capability/lri_luc_main

1.3 Productive Capacity as HPL

The productivity of the site is determined by a number of factors including the nature of the soils, climate and scale of the operation.

1.3.1 Soils

In Figure 3 I have included a screenshot of the data held in Manaaki Whenua Landcare Research's SMap online portal of the soils of New Zealand[4] of the site.

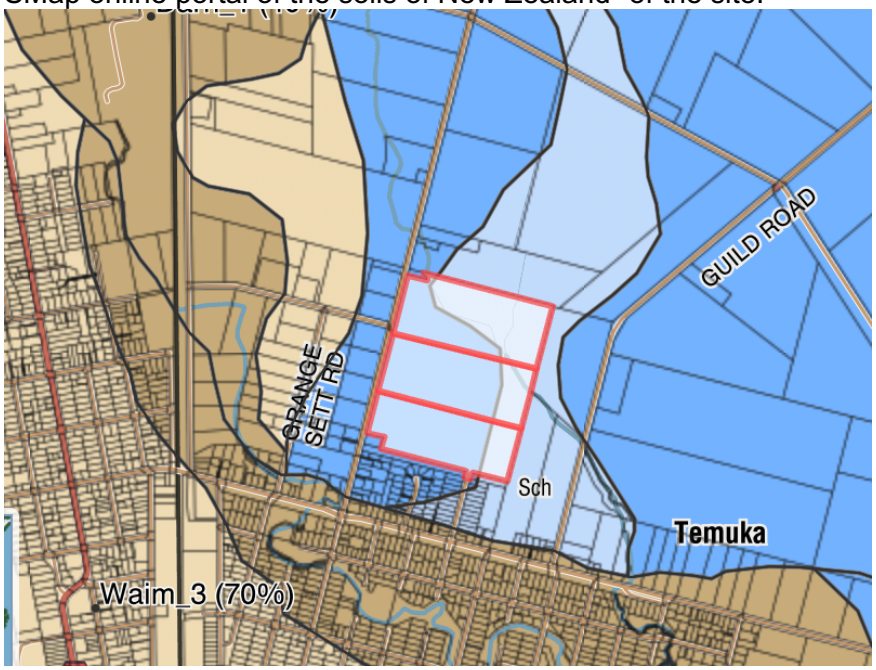

Figure 3: SMAP record of soils on site

Table 2 lists the soils on the site by sibling description, area and proportion.

Table 2: Soils on site by sibling description, area and proportion

Sibling	Area (ha)	Proportion (%)
Ayre_13a.1	15	53
Belf_2a.1	5	17
Waka_1a.1	4	14
Paha_40a.1	4	13
Flax_1a.1	1	3

Definitions of the key soils physical properties that are listed in the SMAP fact sheets or the soils that are present on the site are shown in Table 3.

Table 3: Description of soils on site

Soil Name	Ayreburn	Belfield	Wakanui	Pahau	Flaxton
SMap Name	Ayre_13a.1	Belf_2a.1	Waka_1a.1	Paha_40a.1	Flax_1a.1
Depth Class	Deep (>1m)	Shallow (25-45cm)	Deep (>1m)	Deep (>1m)	Deep (>1m)
Rooting Depth	Unlimited	Unlimited	Unlimited	Unlimited	Unlimited

[4] https://smap.landcareresearch.co.nz/maps-and-tools/app

Depth to stony layer	No significant stony layer within	Shallow	No significant stony layer within	No significant stony layer within	No significant stony layer within
Texture Profile	Silt over clay	Silt	Silt	Silt over clay	Silt
Topsoil Stoniness	Stoneless	Stoneless	Stoneless	Stoneless	Stoneless
Drainage Class	Poorly drained	Imperfectly drained	Imperfectly drained	Imperfectly drained	Poorly drained
Profile Available Water (0 to 100cm)	High (164mm)	Moderate (119mm)	High (167mm)	Moderate to high (134mm)	High (213mm)

Ayreburn soils make up 53% of the site. These are deep silt over clay soils that are stoneless, poorly drained and have a high profile available water (PAW). Belfield soils make up 17% of the site. These are shallow silt soils that are stoneless, imperfectly drained and have a moderate PAW. Wakanui soils make up 14% of the site. These are deep silt soils that are stoneless, imperfectly drained and have a high PAW. Pahau soils make up 13% of the site. These soils are deep silt over clay soils that are stoneless, imperfectly drained and moderate to high PAW. Flaxton soils make up 3% of the site. These are deep silt soils that are stoneless, poorly drained and have a high PAW.

These soils are theoretically suitable for vegetable, arable and a wide range of pastoral land uses. The only constraint these soils have is the poor and imperfect drainage which makes them unsuitable for horticulture.

2 Land Use Constraints

There are a number of significant constraints which have a bearing on the highest and best land use possible on the site.

2.1 Lack of Irrigation Capability

While 19.3 ha of the site has irrigation capability the remaining 8.3 ha does not have any irrigation capability currently. The site is within the Orari Groundwater Allocation Zone, which is currently fully allocated. This means that the only pathway to gain irrigation for the 8.3 ha would be through transfer of an existing consent.

Under the Canterbury Land and Water Regional Plan it states that within the Orari Ground Water Allocation Zone under Rule 14.5.4

The taking and use of groundwater that will substitute an existing surface water permit or groundwater permit that has a direct, high or moderate stream depletion effect is a restricted discretionary activity, providing the following conditions are met:

1. The proposed take, in addition to all existing consented takes will not result in an exceedance of the relevant groundwater T allocation limit in Table 14(zb) and

2. The proposed take will not have a direct, high or moderate stream depletion effect; and

3. The point of abstraction will be within the same property as the existing water permit and there is no increase in the proposed rate of take or annual volume; and

4. The bore interference effects are demonstrated to be acceptable determined in accordance with Schedule 12; and

5. The existing surface water or groundwater permit being replaced is for a take from an overallocated surface water catchment.

Even if it were possible to gain access to additional irrigation water by securing the ability to transfer a consent, drilling a well would be required to secure water access, incurring an estimated cost of $55,260. This does not account for the additional expenses associated with gaining irrigation consent via transfer such as application costs, consultancy fees and setting up the infrastructure required to apply the water. It is our opinion that the total cost of achieving access to irrigation water would preclude it from being viable on this site (26 Factory Road - 8.3 ha).

The scale of the site is restrictive, meaning the economic advantage of gaining irrigation capacity is limited. A prudent operator would find it more feasible to consider establishing operations on a larger land area. By doing so, the expenses that are incurred in establishing water access and infrastructure could be spread across a greater area of land, ultimately making the cost per hectare more viable.

2.2 Exclusion of Horticulture

The potential for intensive horticultural land use has been considered and it has been rejected for several important reasons including:

- The very high cost of establishing an intensive horticultural operation on a relatively small site.
- The lack of irrigation capability on part of the site, which is essential for horticultural crops.
- The poorly drained soils which are unsuitable for growing horticultural crops. They tend to become waterlogged, restrict root growth and oxygen availability.
- The cold winters limit the potential range of horticultural crops.

2.3 Limitations of Arable

The ability to maximize the productivity of any of the potential arable land uses would require that the land was farmed as part of a larger farming entity.

The block of land would have to be incorporated into a bigger growing operation in order to achieve sufficient scale to enable the landowner to maximise productivity. Additionally, there are no large-scale arable operations in direct proximity, meaning that machinery and equipment would need to be transported to the site.

The lack of irrigation capacity on a portion of the site and the transportation of machinery required may limit the appeal to existing arable operators.

2.4 Pastoral Land Use

It would be theoretically possible for the land to be used for pastoral grazing (sheep and beef and dairy support) however there are several significant constraints on that land use being achieved.

The constraints include:

- The costs associated with intensifying the productivity of the site e.g. providing for winter crops, and providing additional supplementary feed from off site, are all too expensive to be justified on such a small scale.

- The proportion of the site that is unable to be irrigated means that in most years, it would lack sufficient moisture over the summer months to maintain the stocking rate, so there would need to be less livestock during that period.
- The poorly drained soils make it unsuitable for large stock over winter periods.

In my opinion, the site would not be an appealing option for a farmer looking to expand their pastoral productive land due to the reverse sensitivity effects to consider, the poorly drained soils and the absence of irrigation.

2.5 Conclusion

The highest and best land use of the site would be mixed arable, with the irrigated area being suitable for irrigated arable and the non-irrigated portion being suitable for dryland dairy grazing.

3 Proposed Land Use

Figure 4 shows the proposed rezoning to residential zoning with the estimated residential housing yield of between 160 and 280 lots. The proposal also includes a stormwater area, naturalised space, roading networks and walking/cycling networks.

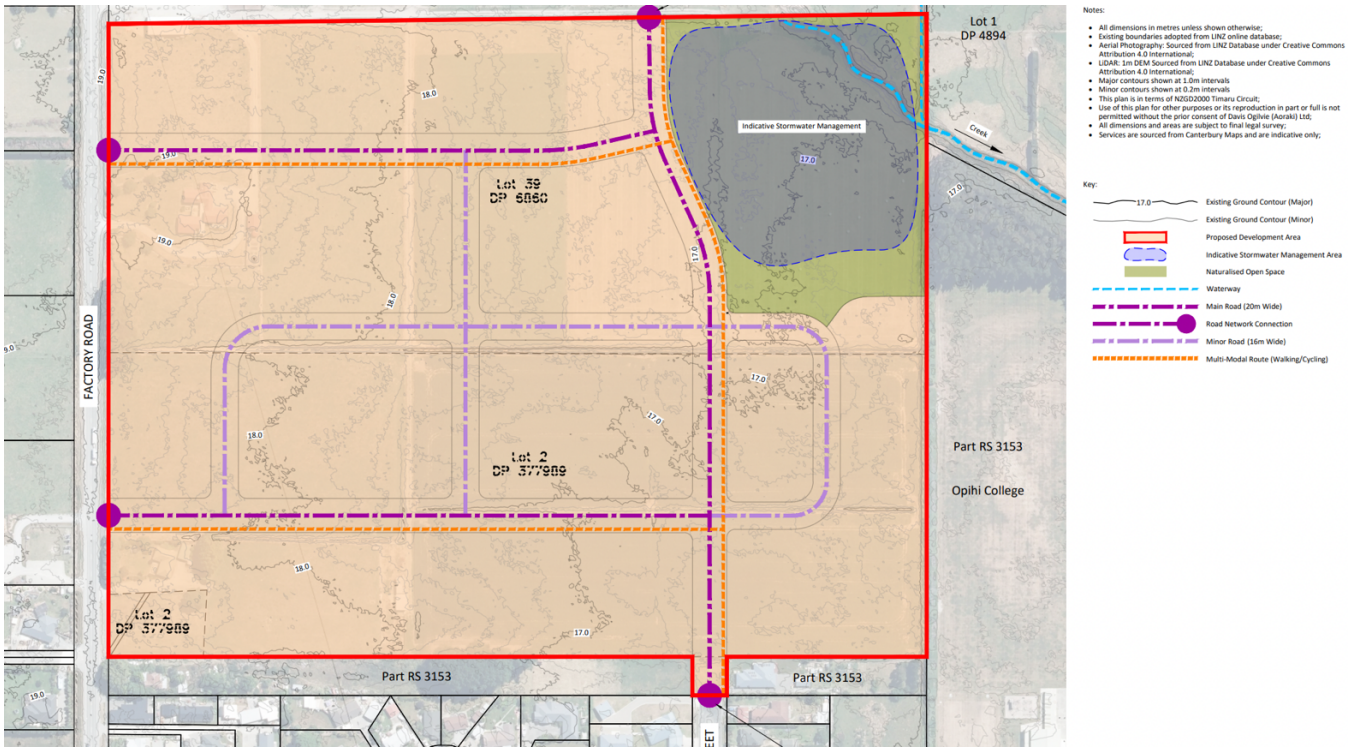

Figure 4: The proposed scheme plan

4 Assessment of the benefits of the Proposed Rezoning Land and the Cost of the loss of HPL.

4.1 Environmental

My assessment of the benefits of the rezoning and the costs of the loss of HPL from an environmental perspective is shown in Table 4.

Table 4: Assessment of the benefits of rezoning and the costs of the loss of HPL from an environmental perspective.

Assessment Category	Benefits of rezoning	Costs of the loss of HPL
Carbon Sequestration	The proposal includes areas outlined as naturalised space and as well as prospective curtilage vegetation which should add to the site potential to contribute to carbon sequestration	While no shelter belts have been identified, there were a few sections of vegetation that maybe lost in the development. This loss is minimal.
Support habitat	Each individual curtilage within the urban sections will contribute to permanent habitat development. Additionally, a substantial portion of the site is designated for naturalised space and stormwater basins, creating open spaces that further support habitat growth.	The potential removal of the existing vegetation could result in a loss to habitat support. However given the small amount of vegetation present the losses would likely be minimal
Water filtration	Water filtration will be enhanced by the development, through the creation of sediment traps within drainage systems. This will benefit the environment by filtering sediment and nutrients before they enter waterways.	
Flood mitigation	The diversion of runoff water from the sections into the stormwater basin presented in the proposal will act as a flood mitigation method.	
Nutrient	The change from rural to urban will have the benefit of a reduction in N loss. This comes from the removal of livestock and fertiliser use.	
Climate regulation	The removal of livestock and fertiliser use on the site will reduce agricultural greenhouse gas emissions. The naturalised space within the development will enhance the site's ability to assist in climate regulation by sequestering carbon and offering some protection against severe flooding and wind impacts.	
Air and water quality	Water quality will benefit from the proposed urban development by the diversion of runoff of water from the sections into the controlled and allocated stormwater basin.	Air quality will be slightly diminished by the conversion from rural land uses to urban development because there will be more urban activity which has the potential to negatively impact on air quality.
Biodiversity conservation	Biodiversity and conservation will benefit from the plantings that will occur in the curtilages of the sections and within conservation space.	

4.2 Social / Cultural

My assessment of the benefits of the rezoning and the costs of the loss of HPL from a social and cultural perspective is shown in Table 5.

Table 5: Assessment of the benefits of rezoning and the costs of the loss of HPL from a social and cultural perspective.

Assessment Category	Benefits of Rezoning	Costs of the loss of HPL
Sense of belonging and place	There will be an increase in the sense of belonging and place on the site with the conversion from rural use to residential. This will house multiple people per household, therefore having a positive influence on the sense of belonging and place. Walk/cycle routes within the development will also create a pathway for the community to get together and interact.	
Social fabric	The social fabric of the urban development will be enhanced on the site and within the wider Temuka	

	District by the additional population that this site will provide housing for.	
Food security		There will be a slight reduction in food production caused by the 28 ha being developed from rural to urban. This will be insignificant given the scale and constraints the site is faced by.
Spiritual value	As far as we are aware there are no cultural heritage sites on or near the site therefore this category is judged as having no impact on either of the considerations.	

4.3 Economic

Our assessment of the benefits of the proposed rezoning development enabled by rezoning and the costs of the loss of HPL from an economic perspective are shown in Table 6.

Table 6: Assessment of the benefits of rezoning and the costs of the loss of HPL from an economic perspective

Assessment Category	Benefits of Rezoning	Costs of the loss of HPL
Income	There will be increased income from multiple sources, including sales, construction, roading and ongoing maintenance. While we haven't worked out the defined cumulative income of the development, sections in the area have been seen to be listed for $169,000[5]. At the lower end expected housing yield this presents an estimated income from section sales of $27,040,000	The loss of income over a 30 year period would equate $722,327 (workings in appendix A)
Employment (FTE)	There will be increased employment both from the construction and ongoing maintenance, which will be required on the site.	The loss of employment from this area of land, based on the B+LNZ representative model and a scale proportion of TAG's Arable Model equates to the loss of 0.16 employees
Flow on impacts to the wider community	There will be considerable flow on impacts to the wider community because the proposed development will result in increased expenditure within the local economy.	While the decrease in inputs sent to processors could potentially impact the district, the volume is so small that any effect on processing companies or their employees is likely to be less than minor.

5 Summary

It is my opinion that the environmental, social, cultural and economic benefits of rezoning of the 28 ha at 26 and 52 Factory Road, Temuka, outweigh the long-term environmental, social, cultural and economic costs associated with the loss of highly productive land for land-based primary production. This therefore leads to the conclusion that the site meets the requirements of Clause 3.6 (1) (c) of the NPS-HPL.

[5] https://www.realestate.co.nz/residential/sale/canterbury/timaru/temuka/section

6 Appendix A

6.1 Economic

I have evaluated the economic cost of losing 28 hectares of the site by calculating the discounted cash flow of the Earnings Before Interest and Tax (EBIT) generated from the site over a 30-year period, with a 6% discount rate applied.
If the site was able to be run as a collective the highest and best land use would be for mixed arable – Irrigated Arable and Dryland Dairy Support. The financial parameters are from The AgriBusiness Groups Arable and Dryland Dairy Support Model. The per ha figures and the total are shown in Table 7.

Table 7: TAG Irrigated Arable and Dryland Dairy Support Economic return

	Total 28 ha
Gross Revenue	140,331
Operating Expenses	87,855
Earnings Before Interest and Tax	52,475

The opportunity cost of the loss of income from the site over a 30 year period is $722,327.