Before the Hearing Panel
Appointed by the Central Otago District Council

Under	The Resource Management Act 1991
In the matter of	Private Plan Change 14 to the Central Otago District Plan

Evidence of Natalie Dianne Hampson

12 May 2020

Applicant's solicitors:
Sarah Eveleigh
Anderson Lloyd
Level 3, 70 Gloucester Street, Christchurch 8013
PO Box 13831, Armagh, Christchurch 8141
DX Box WX10009
p + 64 3 379 0037 | f + 64 3 379 0039
sarah.eveleigh@al.nz

anderson lloyd.

Introduction

1 My full name is Natalie Dianne Hampson.

2 I am a director of Market Economics Limited (M.E) and hold a MSc in Geography with first class honours from Auckland University. I am an associate member of the NZPI and a member of the RMLA. I am currently chair of the Central Otago-Queenstown RMLA committee.

3 I have 18 years' economic consulting and project experience, working for commercial and public sector clients. I specialise in spatial data analysis; assessment of demand and supply; economic sector growth; the growth, form and function of urban and rural economies; retail analysis; resource management policy analysis; and evaluation of economic outcomes and effects, including costs and benefits.

4 I have applied these specialties in studies throughout New Zealand, and across most sectors of the economy, notably housing, land-based primary production, aquaculture, indigenous biodiversity, schooling, business and industrial land, tourism, events and local and central government.

5 I advise central government and district and regional councils throughout New Zealand in relation to rural and urban policy and planning issues and the social and economic effects of these. I also provide consultancy services to private sector clients in respect of a wide range of issues, including mixed-use commercial developments, residential subdivisions and the impact of policies and provisions on their operations and future development opportunities.

6 Recent work includes the Cost Benefit Analysis (CBA) of the NPS on Highly Productive Land (NPS – HPL) (MPI), an assessment of the impact of the proposed NPS – HPL on urban expansion in high growth councils (MPI), the CBA of the NPS on Indigenous Biodiversity (DOC), assessment of the Queenstown Lakes District (QLD) industrial economy and associated evidence to support the proposed General Industrial Zone in stage 3 of the QLDC's district plan review, providing economic input into QLDC's spatial plan, assessment of the economic impact of different scenarios of land use development on Ayrburn Farm in Arrowtown, financial analysis, economic impact and CBA of a proposed wharf and reclamation development in Whitianga, and assessment of dwelling demand in Clyde, Central Otago.

7 I presented evidence on the Wooing Tree private plan change 12 in Cromwell in terms of both residential demand and capacity and the provision of a commercial tourist village. I also presented evidence on the River Terrace private plan change 13 in Cromwell, again in terms of both residential demand and capacity and the provision of a commercial village.

8 For plan change 14 (PC14) I have prepared a Demand and Supply Assessment dated May 2019. This report was supplied as part of the plan change request. I have not been on the plan change site but have visited the Ripponvale Road area. I am familiar with Cromwell and its satellite urban settlements and the Cromwell ward generally as I am a resident of Wanaka.

9 In preparing this statement of evidence I have considered the following documents:

(a) The PC14 application and section 32 assessment, including my original technical report noted above and the evidence of Paul Edwards.

(b) The 'Potential Horticultural Land – Central Otago District Council' report prepared for Horticulture New Zealand by the AgriBusiness Group (December 2018). This report is identified as informing the Cromwell Master Plan process in the Horticulture New Zealand submission.

(c) The section 42a report; and

(d) Selected submissions (primarily ORC (#67), James Dicey (#28), Robin Dicey (#18), Andrew McFarlane (#52), Horticulture New Zealand (#38), Rockburn Wines (#72), Alan Smith (#78)).

Code of Conduct for Expert Witnesses

10 While this is not a hearing before the Environment Court, I confirm that I have read the Code of Conduct for expert witnesses contained in the Environment Court of New Zealand Practice Note 2014 and that I have complied with it when preparing my evidence. Other than when I state I am relying on the advice of another person, this evidence is within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

Scope of evidence

11 I have prepared evidence in relation to:

(a) The general approach and key findings of the Demand and Supply Assessment.

(b) The terminology used to describe 'rural residential' and 'rural lifestyle' type lots.

(c) Capacity, growth and alternative locations.

(d) Loss of productive land and its significance.

(e) Issues raised in selected submissions, where not already covered more generally above.

12 Topics b) – d) above respond to themes discussed in the s42a report, and so incorporate my response to the s42a.

Executive Summary

13 My evidence brings together spatial analysis of a range of datasets to examine trends in the projected demand for dwellings by households wanting to live in the Cromwell ward but outside of the Cromwell urban area[1]; the supply of properties in that broad catchment by size; the remaining capacity of operative zones (and the direction of non-statutory strategies) to meet future market demand; the contribution of proposed PC14 dwelling capacity to help cater for that market demand; and the significance of the opportunity cost for further horticultural development on Shannon Farm that would result from the proposed development of rural residential and rural lifestyle properties on the site.

14 A number of submissions opposed to PC14 submit that the productive potential of Shannon Farm should be retained for future development of more commercial orchards, which play a key role in the economy of the Cromwell Basin and wider district. While my analysis shows that the land within the proposed Rural Resource Area 5 could be considered highly productive (from a high-level desktop analysis approach), and would appear to have productive potential based on surrounding land use, a site specific assessment has shown that the opportunity for horticultural development of a commercial nature is unlikely to be realised.[2]

15 Capacity of existing zones in the Cromwell ward outside of the Cromwell urban area is finite and not sufficient to cater for medium-long term growth projected to occur in that area. This capacity cannot be relied on as an alternative to PC14. There are no plan changes underway that I am aware of that would allow for expansion of the existing satellite urban areas or intensification of the Rural Residential Zone for example to create additional capacity. The 160 lots enabled by PC14 would consolidate expected growth outside of the Cromwell urban area – minimising the spread of ad-hoc subdivision in the rural fringe/rural surrounds and make efficient use of the area of land to be developed. It will provide for an estimated 18% of projected demand growth in this catchment (potentially less if growth projections are conservative). The mix of lot sizes will appeal to a wide market for which there is demonstrated demand. The proximity of Shannon Farm to Cromwell could ensure a greater number of future households wanting to live in the rural fringe/rural area of Cromwell minimise travel distance to shops, education, services and employment.

[1] As determined by Council's growth projections.

[2] Evidence of Mr Edwards.

16 While the development of the proposed cherry farm could occur already in the Rural Resource Zone, there is no certainty it will occur and a benefit of PC14 is that it delivers economic growth[3] sooner rather than later[4] and also provides opportunities for recreational access on what would otherwise be inaccessible private land.

Overview of Demand and Supply Assessment

17 The following overview deliberately avoids any terminology associated with different lots sizes and used in my report, as this issue is discussed further below.

18 This report focussed on assessing future demand by markets (households) broadly seeking lots in the range of 2,000sqm-1ha and 1ha-8ha in Cromwell's rural fringe and rural surrounds, so that the proposed private plan change can be considered in that context. For the purpose of my report, Cromwell's "rural fringe and rural surrounds" refers to the area within the Cromwell Ward[5] but outside the Cromwell urban area (which is the area defined as the Cromwell Census Area Unit (CAU)[6], or there abouts). This report considers both the quantum of demand for these property size categories and its location, including relative to past and existing supply patterns.

19 The plan change creates – as a minimum - a 2,000sqm minimum lot size in part of the proposed Rural Resource Area 5 zone that sits within Chapter 4 of the District Plan. The Rural Resource Area contains rules that guide a range of allotment sizes, and the minimum sought in PC 14 is similar to the *average* lot size for the Residential Resource Area 4 zone in Bannockburn. It sits below the existing 3,000sqm minimum lot size of the Residential Resource Areas 1 and 5 (found in small pockets around Lake Dunstan and in Lowburn) and above the 1,500sqm minimum lot size of the Residential Resource Area 4 and 8 (found near Crippletown/Bendigo and Bannockburn).

20 Other minimum lot sizes created in the proposed Rural Resource Area 5 (3,000sqm, 4,000sqm and 1ha) are consistent with supply enabled in other Cromwell Ward zones – particularly the Residential Resource Area 1 and

[3] I refer to the evidence of Mr Larsen.

[4] Short term benefits are typically valued more than long-term benefits. This is known as a positive time preference in economic terms, also reflected in the present value where discount rates area applied.

[5] Also referred to in this evidence as the Cromwell Community Board area – they have the same extent.

[6] The Council growth projections relate specifically to this CAU boundary, while the Cromwell Masterplan included some additional small areas north and south of the CAU where the pattern of urban development was cohesive with the area within the CAU.

Residential Resource Area 5 (3,000sqm), Residential Resource Area 6 and Residential Resource Area 2 (4,000sqm) and the Rural Resource Area 2 (1ha).

21 The plan change also creates a 3ha minimum lot size that is new in the context of operative Cromwell Ward zones. These minimum lot sizes offered by PC14 create greater diversity in the housing market of Cromwell Ward while responding to landscape considerations (addressed in the evidence of Mr Milne).

22 Overall, 70% of the capacity of the proposed Rural Resource Area 5 is expected to meet demand for lots within the 2,000sqm-1ha size category. This covers the land in the Rural Lifestyle Areas 1-3 in the structure plan. The remaining 30% of capacity is expected to meet demand for those wanting larger 1h-8ha rural lifestyle properties (within Rural Lifestyle Areas 4 and 5 of the structure plan).

23 Analysis has shown that dwelling growth in Cromwell Ward has been strong and while that number of dwellings inside the Cromwell urban area (i.e. the Cromwell CAU) accounts for the larger share of total dwellings in Council's dwelling projections, the count of dwellings in the rest of the ward (i.e. the rural fringe/rural area – which does include some satellite urban areas including Lowburn, Pisa Moorings and Bannockburn) is growing faster - on average, 35 dwellings a year based on data between 1994 and 2018.

24 For every 3 new dwellings developed in the Cromwell urban area, there have been 2 new dwellings developed in the rest of the ward outside of the Cromwell urban area.

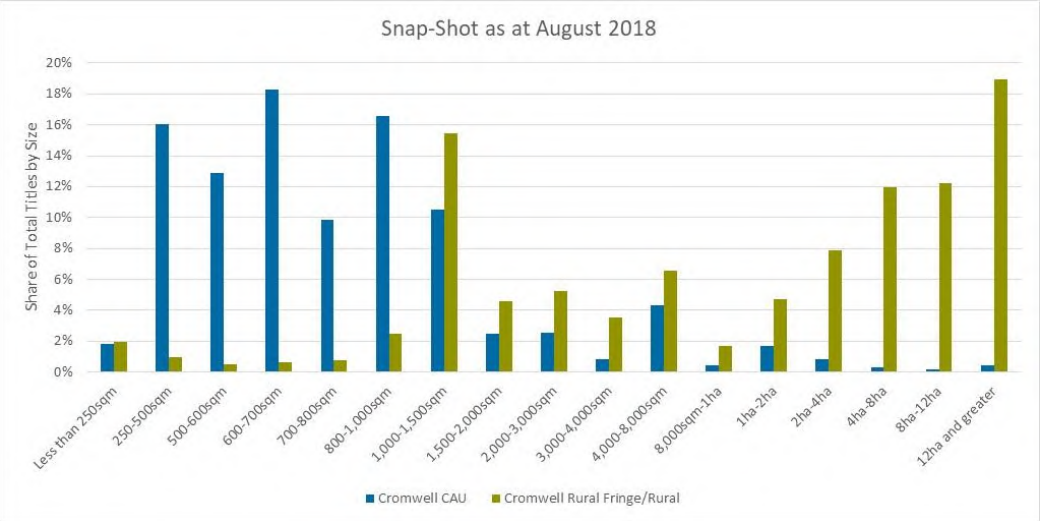
25 My analysis shows that the supply of lot sizes in the Cromwell urban area (CAU) has a different profile from the supply of lot sizes in the rest of the ward. This was summarised in Figure 10 of my report (repeated below, Figure 1). There are lots sized between 2,000sqm and 1ha in both the urban area of Cromwell and in the rest of the ward. This overlap relates to zoning (various Residential Resource Area zones[7]) that are found both within the Cromwell urban area and in satellite urban areas some distance from Cromwell township. The significant majority (61%) off all parcels sized between 2,000sqm-1ha are located outside of the Cromwell CAU. This means that the Cromwell CAU has not, historically, delivered many properties to cater for the 2,000sqm-1ha market[8], and is very unlikely to in the future because the urban area is intended to be further intensified under the Cromwell Spatial

[7] My analysis is limited to parcels and zones in found within the Cromwell Ward. Across the whole district, lots sized 2,000sqm-1ha also fall within Rural Resource Area zones.

[8] Lots sized 2,000sqm-1ha (across all zones not just residential) located in the Cromwell CAU make up just 8% of all lots in the CAU. The significant majority of lots supplied in the Cromwell CAU are less than or equal to 2,000sqm. Some of the 2,000sqm-1ha lots included in the Cromwell Rural Fringe/Rural Area are located outside the Cromwell CAU but still within the cohesive urban area of Cromwell. The Spatial Plan has identified these areas for intensification in the future.

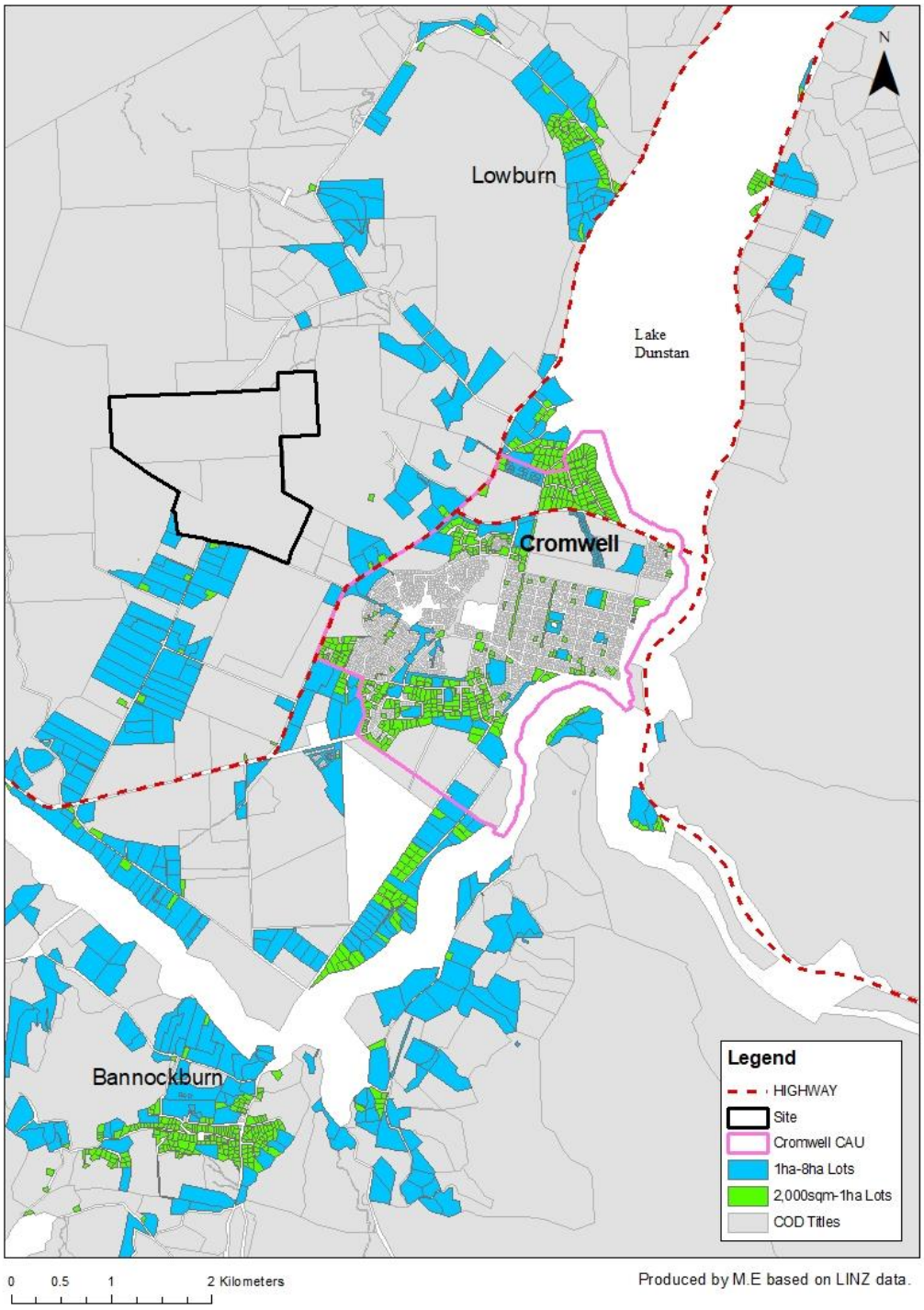
Framework – Spatial Plan. This demand will need to be met outside of the (current) Cromwell urban area in the future.

Figure 1 – Cromwell Ward Titles by Size Bracket and Urban-Rest of Ward Location



26 I mapped the location of parcels sized between 2,000sqm-1ha (green in the map) and 1ha-8ha (blue in the map). This was Figure 13 in my report (replicated below, Figure 2).

Figure 2 – Cromwell Ward Titles by Size Bracket and Urban-Rest of Ward Location



27 Key trends for the location of these property categories (and reflecting both where different zones area located and what lots sizes those zones enable) were:

(a) 2,000sqm-1ha lots and 1ha-8ha lots are concentrated around the river and lake margins. Examples include (but are not limited to) Pearson Road and Bannockburn Road.

(b) 2,000sqm-1ha lots and 1ha-8ha lots are also concentrated in valleys and/or close to main roads.

(c) Lowburn has developed as a combination of 2,000sqm-1ha lots and 1ha-8ha lots.

(d) Ripponvale Road has been extensively developed into 1ha-8ha lots, with a small number of 2,000sqm-1ha lots. Many of these 1ha-8ha lots include productive land uses (horticulture).

28 If the PC14 lots were added to Figure 2, it would show a cluster of green lots and blue lots. In my view, this is not out of context with patterns already developed outside of the Cromwell urban area in the Cromwell Basin.

29 Council's dwelling projections estimate where growth is projected to occur (geographically) and assumes no constraints to meeting that demand. Council dwelling growth projections (released in 2016) that were relied on in my report are now out-of-date[9] and I understand that updates have been held up by the delays in the release of StatsNZ projection data. My analysis was based on estimated growth of total dwellings of approximately 990 within the Cromwell CAU and 860 in the rest of the Cromwell ward between 2016-2043[10]. M.E expects this growth will prove conservative when new data becomes available. Whatever the updated growth projections will show, it is the demand growth projected to occur outside of urban Cromwell that PC14 is trying to help accommodate. Dwelling demand growth in this catchment was estimated at 71% over that period, with most demand anticipated in the areas relatively close to Cromwell (i.e. between Pisa Moorings in the north and Bannockburn in the south).

30 While I did not examine remaining capacity in zoned areas in my report, the current growth projections will mean that suitable land outside of the Cromwell urban area (which will include a combination of satellite urban areas, rural fringe and more distant rural areas) will need to be identified, zoned and (where applicable) serviced – at appropriate times and at appropriate scales - to ensure that projected dwelling demand can be met over the long-term. A significant share of the projected growth will be for lots between 2,000sqm-1ha and 1ha-8ha in keeping with past trends.

31 PC14 would enable a maximum of 160 dwellings in the lot size ranges I have assessed within Cromwell's rural fringe and will respond directly to clear market demand for these property types outside of the Cromwell urban area. Based on

---

[9] The Cromwell Spatial Framework – Spatial Plan (May 2019) was based on the High Growth Projection which is higher than the growth projection previously recommended by Council (and that my report was based on). Based on my assessment for PC12, even the high projection is likely to be conservative.

[10] This would be growth of 760 between 2018 (projected not actual) and 2043.

Council's current total dwelling growth projections, PC14 would cater for approximately 18% of long-term dwelling demand projected to occur between 2016 and 2043 in areas outside the Cromwell urban area but within the Cromwell ward.

Terminology – 'Rural Residential' and 'Rural Lifestyle'

32 As discussed above and in my Supply and Demand Assessment report, the purpose of my analysis was to examine demand for properties outside of the Cromwell urban area according to broad size categories. My report provides an explanation of how those categories were reached. For simplicity I called lots less than 1,500sqm "residential", lots 2000sqm-1ha "rural residential"[11], lots 1ha-ha "rural lifestyle" and lots greater than 8ha "rural". Hence, for the purpose of my assessment, Rural Lifestyle Areas 1, 2 and 3 of the proposed Rural Resource Area 5 were deemed to deliver "rural residential" lots and the Rural Lifestyle Areas 4 and 5 were deemed to deliver "rural lifestyle" lots.

33 The s42a report author considers (page 52) that it would be more appropriate to term the lots delivered in Rural Lifestyle Areas 1-4 (i.e. those with minimum lot areas between 2,000sqm and 1ha) as "*large lot residential*" given that the minimum lot areas proposed equate to the minimum or average lot areas specified in various Residential Resource Areas in the operative district plan (emphasis added).

34 The s42a report states that "*By coining the term "rural residential" and "rural lifestyle" in the Demand & Supply Assessment report ME Consulting is, in substantial part, assessing the demand and supply for large residential allotments rather than allotments that have a rural character or association*" (page 52).

35 I consider that the author has misunderstood the purpose of my report in that my descriptors were not (and should not be) intended to inform a comparative analysis with the terminology used in the District Plan.

36 Across the district, both the Rural Resource Area and the Residential Resource Area contain rules governing lot sizes that could – using my terminology – be considered as rural residential and rural lifestyle. For the purposes of a supply and demand assessment it is appropriate that I consider the lot sizing as I have done because the market will buy based on the size, characteristics and location of a property and will not make that decision based on zone type.

Capacity, Growth and Alternative Locations

37 Page 53 of the s42a report states that "*A key resource management issue to be addressed is whether it is better to provide for the demand for large lot residential*

[11] And not to be confused with the Rural Residential Zone in the COD operative district plan (average lot size of 2ha), which based on my approach falls within the 'rural lifestyle' category.

development at the subject site or elsewhere, perhaps by expanding existing specific areas within the Residential Resource Area that provide for larger lot residential subdivision and development. Another alternative would be to meet the demand for dwellings by consolidating such development within existing urban areas. We question the appropriateness of providing an additional supply of larger residential allotments at an enclave within the rural environment as proposed through Plan Change 14".

38 Again, this conclusion was formed on the basis of the development being "large lot residential", which is a product of development within an urban zone and not a rural zone.

39 Notwithstanding this, the alternatives suggested in the s42a report have not been ground truthed or backed with any evidence.

(a) Firstly, the district plan has already provided for enclaves of allotment sizes similar to that proposed in PC14 across the Cromwell Basin (outside of the Cromwell urban area) and wider district. Appendix 1 of my report identifies the general localities of the Residential Resource Areas (1, 2, 4, and 5) that provide lots sized between 2,000sqm and 4,000sqm within Cromwell Ward. These include Bannockburn, lakeside pockets, Lowburn, and bordering the Kawarau River south of the township. These are also mapped in Figure 1 of my report[12]. Outside of Cromwell ward, Rural Resource Area 3 includes provision for some lots between 1,500sqm and 3,000sqm. Like PC14, these comparable zones are all bordered by the Rural Resource Area. Many of these areas are relatively close to Cromwell's urban area, and PC14 would be closer than most. While PC14 would result in a <u>new</u> enclave of rural residential and rural lifestyle capacity, in my view that does not mean its location is inappropriate.

(b) Second, there is no realistic opportunity to create more large lot residential capacity within the existing urban area of Cromwell and doing so would be counterintuitive. PC12 has rezoned a large area of what was large lot residential capacity (Residential Resources Area 6) in the urban area to enable higher density residential development. This more efficiently provides for urban growth and other recent developments within the urban area are taking a similar approach.

(c) The Council's Spatial Framework - Spatial Plan adopted following the Cromwell Masterplan consultation process was based on further intensification of the Cromwell urban area, and no greenfield expansion. The

[12] It should be noted that Figure 1 in my report is based on zoning data supplied by CODC in August 2017 and there have since been changes to zoning in some locations.

approach adopted by Council[13] is expected to push even more demand for "larger lot" residential living into the rural fringe, rural and satellite urban areas of the Cromwell Basin. PC14 offers a solution to this.

(d) At the same time, the spatial framework states that the satellite urban settlements in the Cromwell Basin would also not be expanded. It is difficult to see how the satellite urban areas could then provide more capacity for "larger lot" residential capacity as suggested in the s42a report.

(e) I believe a tension exists between the long-term demand for dwellings outside the existing Cromwell urban boundary and the supply that can be delivered under the operative district plan and the Spatial Framework.

(f) Third, the suggestion to consolidate larger lot residential development in existing urban areas is a valid one but not a long-term solution. I presume this suggestion means that vacant capacity should be used prior to zoning any new enclaves or expansions[14]. I have not examined in detail vacant potential of the large lot residential zones, higher density residential zones and Rural Residential Zone in the area outside of urban Cromwell in the Cromwell ward. However, in PC13, CODC presented evidence of vacant capacity in Bannockburn and Lowburn of between 136-168 additional large lot residential dwellings and vacant capacity in Pisa Moorings of between 70-100 residential dwellings[15]. I indicatively estimate that there may be potential to create another 47 lots in the operative Rural Residential Zone (without subdividing parcels already used for horticultural land cover)[16].

(g) The three existing Residential Resource Areas could therefore cater for 24-31% of the 860 additional total dwellings projected in the rest of Cromwell ward (and outside of the Cromwell urban area) by 2043. With the addition of my estimated capacity in the Rural Residential Zone, combined capacity could indicatively cater for 29-37% of total growth projected to occur in the rest of Cromwell ward. This shows a significant shortfall of capacity. With the addition of capacity in PC14 (i.e. 160 dwellings), combined capacity

---

[13] Page 39 of the Cromwell Spatial Framework – Spatial Plan shows that existing low density residential areas in urban Cromwell will be rezoned to residential densities.

[14] I note that the NPS-UDC requires that councils should zone sufficient capacity to meet projected growth in the medium term (i.e. up to 10 years ahead) inclusive of a buffer on top of demand. It is therefore inappropriate to wait until operative capacity has been fully developed.

[15] These same capacity estimates are contained on page 29 of the Cromwell Spatial Framework – Spatial Plan.

[16] Based on this simple approach (and not considering any other constraints to subdivision), I estimate that 2 additional 2ha (average) lots could be created on Bannockburn Road, 5 additional (average) 2ha lots could be created on Ripponvale Road and an estimated 40 additional (average) 2ha lots could be created on Pearson/Sandflat Roads. This is a total vacant capacity of 47 (average) 2ha lots.

could indicatively cater for 48-55% of total projected growth in this catchment. As the projection of growth may be conservative, it's possible that operative and proposed capacity outside of the Cromwell urban area would cater for an even lower share of growth to 2043.

(h) As potential operative and proposed capacity is less than projected demand, it is likely that all areas would be taken up over time and most likely in parallel with the take up of the proposed Rural Resource Area 5 if approved. In other words, PC14 will not prevent Lowburn, Bannockburn or Pisa Moorings from growing and fulfilling their zoned capacity.

(i) As shown by these simple calculations, the need for additional dwelling capacity outside the Cromwell urban area is a matter of when, not if (and the need would continue to exist even after PC14 is fully developed). The benefit of zoning additional capacity in PC14 now is that it provides greater choice for rural living in the housing market, stimulates healthy competition between landowners/developers and allows a greater share of total future households in Cromwell ward to live in close proximity to Cromwell township.

(j) It is noteworthy in my opinion that subdividing the Proposed Rural Resource Area 5 (142ha) into say average 2ha lots[17] would create capacity for an estimated 49-56 lots (allowing for between 20-30% of gross zone area to be used for roads and open space). The forgone capacity (opportunity cost) would be between 104-111 lots in PC14. This outcome would address a much smaller share of the strong dwelling demand growth projected to occur in the area outside of urban Cromwell and may not create any capacity for rural residential living (i.e. lots sized between 2,000sqm-1ha) which is expected to account for a significant share of total dwelling demand in this catchment and which was considered a positive effect of PC14 in the s42a report.

40 Once existing vacant larger lot residential, residential and rural residential capacity is consumed, it is not realistic to expect that those households wanting a rural residential or rural lifestyle lot to opt instead for a smaller residential lot in Cromwell. Two outcomes are likely. One is that there will be greater pressure for ad-hoc development in the Rural Resource Area to meet demand. The other is that households will look outside of the Cromwell Ward (or Central Otago District) to meet their rural living preferences.

41 Overall, existing vacant capacity is finite and there is no district plan review underway that provides a strategic approach on how medium-long term dwelling

[17] As submitted by Mr Alan Smith (submission #78).

demand outside of the Cromwell urban area will be managed[18]. PC14 provides both capacity for that market and the ability to consolidate development.

Loss of Productive Land

42 The s42a report concludes "*that the proposal will have a significant adverse effect as it will enable the use of a substantial area of land that is suitable for horticultural development (particularly orcharding) for large lot residential subdivision and development. We acknowledge in this context that land suitable for horticultural development for orcharding is a finite resource; and that the loss of the potential to utilise this land for these purposes is a significant adverse effect*" (page 49, emphasis added).

43 Concerns over loss of productive land as a result of PC14 are raised by other submitters, including but not limited to, Horticulture New Zealand[19] who submit that soils found at Ripponvale have economic value for orcharding and DJ Jones Family Trust & Suncrest Orchard Limited[20] who submit that there is limited amount of land such as this (i.e. a unique mix of local soil conditions, available water supply and an ideal micro climate) with appropriate zoning available in the Cromwell Basin. Various other submitters state that land suitable for horticultural production should not be converted to houses.

44 I have carried out some additional spatial analysis to help test the two elements stated in the s42a report above: first that the area proposed for rural residential and rural lifestyle development in the proposed Rural Resource Area 5 is a substantial area of land suitable for horticultural development, and second that the loss of that land will be significant.

45 To do this I have examined spatial data on the area of land cover (ha) associated with agricultural activities over time to understand which land covers are expanding and which are shrinking and where expansion is concentrated. I then examined Land Use Capability data to understand both its geography and relevance to selected land covers. Last, I have combined various spatial datasets to indicatively map highly productive land (HPL) so that the extent of this on Shannon Farm can be quantified and any losses placed in context. For completeness, my analysis covered the total Otago Region but I have focused on the findings for Central Otago District (COD) and also the Cromwell Community Board area (which has the same

[18] The ORC submission (#67), page 4, recommends that CODC "*undertake to update and refresh the Cromwell Strategic Framework or other suitable strategy to account for rural/residential development beyond the existing urban area to provide clear guidance and infrastructure alignment to manage the demand for further lifestyle development and non-intensification demand as future development proposals of this type are likely to follow*".

[19] Submission 38/4.

[20] Submission 45/3.

extent as the Cromwell Ward). It is also not limited to potentially productive land for horticulture, although that is a component of the HPL that I have assessed. I also comment on the extent of potential horticultural land mapped by the AgriBusiness Group and the loss of productive potential in PC14 in the context of that spatial analysis.

Trends in Agricultural Land Cover

46 This section uses the Land Cover Data Base (LCDB)[21] data of land cover between 2001 and 2018 to show how the area (hectares) of selected agricultural land cover has changed and where that change has occurred within Otago Region. Looking at past trends is a useful predictor of future trends. The analysis focusses on 'High Producing Exotic Grassland'[22], 'Orchard, Vineyard or Other Perennial Crops'[23] and 'Short Rotation Crop Land'[24].

47 Overall, COD contains 229,061ha of these selected agricultural land covers (as at 2018). This is 25% of the regional total. A significant 96% of this is high producing exotic grass land. Just 2% of the total (4,766ha) in COD is the combined orchard, vineyard or other perennial crop land (with 50% in the Cromwell Community Board Area). Short rotation crop land (4,116ha) makes up the remaining 2% of selected agricultural land cover in COD.

48 Attachment 1 shows that the area of selected agricultural land covers in Otago region has increased by 23,161ha between 2001 and 2018 (according to the LCDB). This is a 3% increase resulting in a change of land use to these agricultural activities. The majority of the change (94%) has been the increase in high producing exotic grassland. This has increased by 3% although is an additional 21,775ha of land area. Combined orchards, vineyards and other perennial crops make up 6% of the growth in selected agricultural land cover during that period (an increase of 1,317ha). Short rotation crop land has grown by just 69ha (less an 0.5%).

---

[21] https://lris.scinfo.org.nz/layer/104400-lcdb-v50-land-cover-database-version-50-mainland-new-zealand/

[22] Exotic sward grassland of good pastoral quality and vigour reflecting relatively high soil fertility and intensive grazing management. Clover species, ryegrass and cocksfoot dominate with lucerne and plantain locally important, but also including lower-producing grasses exhibiting vigour in areas of good soil moisture and fertility.

[23] Land managed for the production of grapes, pip, citrus and stone fruit, nuts, olives, berries, kiwifruit, and other perennial crops. Cultivation for crop renewal is infrequent and irregular but is sometimes practiced for weed control.

[24] Land regularly cultivated for the production of cereal, root, and seed crops, hops, vegetables, strawberries and field nurseries, often including intervening grassland, fallow land, and other covers not delineated separately.

49 Across Otago, 49% of the 2001-2018 growth in total area of selected agricultural land covers has been in COD (+11,386ha of land, mainly associated with 10,330ha of additional high producing exotic grassland in the district) (Figure 3). Of the 1,317ha of new orchard, vineyard or other perennial crop land in the region since 2001, COD accounts for 87% of that growth (+1,150ha).

50 In terms of the conversion of land cover to orchard, vineyard or other perennial crops in COD between 2001 and 2018, 64% of the new area was classified as high producing exotic grassland in 2001, 11% was short rotation crop land in 2001, 1% was previously forestry/deciduous hardwood land and 24% was in other non-indigenous land covers in 2001. It is not surprising that a combined 75% of the land since converted to horticulture, vineyards or other perennial crops was previously in some form of intensive (irrigated) agriculture as the presence of available water is a critical feasibility factor, particularly for orchard development.

51 When COD is examined in more detail, the Cromwell Community Board area is where 53% of district growth in orchards, vineyards or other perennial crops has occurred. This highlights that growth is not limited to the Cromwell Basin and other areas can also provide for horticultural growth within the district. In the Cromwell Community Board area, short rotation cropland has decreased by 18ha since 2001, but this is expected to have been converted to orchards or vineyards (although makes up only a small share of the total land conversion to orchards and vineyards).

Figure 3 – Change in Selected Agricultural Land Cover Hectares 2001 to 2018 in Central Otago District

Community Board Area	Selected Land Cover	2001 (ha)	2018 (ha)	2001-18 (n)	2001-18 (%)	Share of District High Producing Grassland Growth	Share of District Orchard, Vineyard, Perennial Crop Growth	Share of District Short Rotation Cropland Decline	Share of Total District Growth
Cromwell Community	High Producing Exotic Grassland	23,621	24,760	1,139	5%	11%			
	Orchard, Vineyard or Other Perennial Crop	1,776	2,390	614	35%		53%		
	Short-rotation Cropland	1,043	1,025	- 18	-2%			19%	
	Sub-Total	26,440	28,175	1,734	7%				15%
Maniototo Community	High Producing Exotic Grassland	97,126	100,964	3,837	4%	37%			
	Orchard, Vineyard or Other Perennial Crop	-	-	-	0%		0%		
	Short-rotation Cropland	1,423	1,424	1	0%			-1%	
	Sub-Total	98,550	102,388	3,838	4%				34%
Teviot Valley Community	High Producing Exotic Grassland	37,608	42,141	4,533	12%	44%			
	Orchard, Vineyard or Other Perennial Crop	716	949	233	33%		20%		
	Short-rotation Cropland	634	553	- 81	-13%			86%	
	Sub-Total	38,958	43,643	4,685	12%				41%
Vincent Community	High Producing Exotic Grassland	51,493	52,314	821	2%	8%			
	Orchard, Vineyard or Other Perennial Crop	1,124	1,427	304	27%		26%		
	Short-rotation Cropland	1,110	1,114	4	0%			-4%	
	Sub-Total	53,727	54,855	1,128	2%				10%
Total Central Otago District	High Producing Exotic Grassland	209,849	220,179	10,330	5%	100%			
	Orchard, Vineyard or Other Perennial Crop	3,616	4,766	1,150	32%		100%		
	Short-rotation Cropland	4,210	4,116	- 94	-2%			100%	
	Sub-Total	217,675	229,061	11,386	5%				100%

Source: LCDB v5, M.E

52 This analysis demonstrates that the net increase in productive land cover between 2001 and 2018 in the Cromwell Community Board area is 1,734ha but demand for additional orchard or vineyard land accounted for just 35% of the total growth. The greatest demand for productive land since 2001 in the Cromwell Community Board area has been for High Producing Exotic Grassland. While the orchard/vineyard sector demands relatively less land, it generates the greatest employment (economic) return.

Geography of LUC 1-3 land and Relevance to Agricultural Land Cover

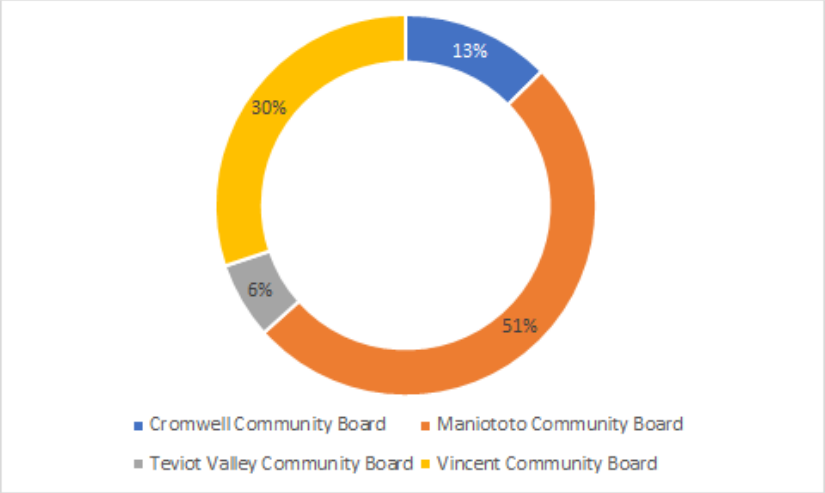
53 The importance of land use capability classifications, and particularly classes 1-3 has been elevated as a result of the proposed NPS-HPL. While this NPS has not been finalised or gazetted (and has no legal weight), the proposal established a correlation between HPL and LUC classes 1-3 at a national level so is useful as general guidance to inform my assessment. However, the proposed NPS-HPL also recognised that in some locations, HPL is not limited to LUC class 1-3 and LUC class 1- 3 land may not be confirmed as HPL – i.e. it tells only part of the story. That recognition is particularly relevant in places like Cromwell and COD generally.

54 To the extent that LUC is still relevant (as part of the area that may be considered HPL), I have examined its geography, limited to the NZ Land Resource Inventory (NZLRI) spatial dataset. This data has a number of limitations, including accuracy at a property level, and this must be taken into account. Not all LUC 1-3 land is still available for primary production. The dataset is relatively old and some areas of LUC 1-3 have been covered with urban settlement, transport infrastructure, landfills and a range of other non-productive activities since mapped.

55 Attachment 2 shows that COD contains 79,002ha of LUC class 1-3 land, and all but 200ha of which is LUC class 3 land. This LUC class 1-3 land covers just 7.9% of COD, which is a minor share (i.e. in Clutha District, LUC 1-3 land covers 30% of the district). COD's LUC class 1-3 land makes up just 20% of the regional resource.

56 In the Cromwell Community Board area, there is an estimated 9,971ha of LUC 3 land. There is no LUC 1-2 land. The LUC 1-3 land covers just 3.4% of the total Cromwell Community Board area (the lowest coverage of the four community board areas in COD). LUC 1-3 land in the Cromwell Community Board area makes up 13% of all LUC 1-3 land in COD (Figure 4) and 3% of the regional resource.

Figure 4 – COD Share of total LUC 1-3 land by Community Board (NZLRI)



57 Of the LUC 1-3 land in COD, 93% or 73,336ha is located in the Rural Resource Area (and excludes any land within the Rural Resource Area that is protected land or contains a designation in the operative district plan or falls within Rural Resource Areas 1-4)[25]. The balance is therefore located in other zones (including the Rural Residential Zone and Residential Resource Area zones) or falls within protected land areas (i.e. reserves or conservation areas) or a designated area. In terms of protecting the productive capacity of LUC 1-3 land for further growth of primary production, it is therefore the area of LUC 1-3 class land in the Rural Resource Area (as described above) that provides the greatest potential.

58 Attachment 3 shows the total regional breakdown of total LUC class 1-3 land that falls within rural general or rural production zones[26] and excluding designation[27] and protected land. It includes a breakdown of what land cover occupies that rural zoned LUC 1-3 land.

59 Attachment 3 shows (red column) that on average across the Otago Region, just 40% of the selected agricultural land cover in rural zones (excluding protected areas and designations) falls on LUC 1-3 land. The lowest reliance on LUC 1-3 land is by high producing exotic grass land cover (39% on LUC 1-3 and the balance on land with lower land use capabilities). Less than half (46%) of the combined orchard, vineyard and other perennial crop land use is located on LUC 1-3 land. This reflects anecdotal evidence that less versatile soils are often well suited for grape growing and orchards and crops can exist on a range of land types so long

[25] This approach is consistent with proposed NPS-HPL guidance whereby regional councils have the option to exclude rural lifestyle zones from consideration of HPL even where they contain LUC1-3. The core area of focus is HPL in general rural zones or rural production zones.

[26] GIS zoning files supplied by each council within Otago.

[27] Where able to be obtained from each council.

as the climate is appropriate, and water is available. Short rotation crop land is however highly dependent on LUC 1-3 land (75% of the total is on LUC 1-3 land).

60 Conversely, Attachment 3 also shows (purple column) what currently (2018) occupies LUC 1-3 land in Otago Region. A significant 93% is utilised by selected agriculture land covers. This is comprised of 90% utilisation by high producing grasslands, 3% short rotation crop lands and 1% orchards, vineyards or other perennial crops. A further 2% is utilised by exotic forestry, 2% by low producing grassland, and 1% by deciduous hardwoods. The remaining 2% is split over other land covers.

61 Figure 5 shows the same breakdown for total COD (top table). Utilisation of LUC 1-3 land in the Rural Resource Zone[28] by agriculture is high and similar to the regional average at 92%. However, in COD a lower share of total agricultural land cover is situated on LUC 1-3 land (30% compared to 40% regionally). Only 42% of orchard/vineyard and other perennial crop land cover in COD depends on LUC 1-3 land.

Figure 5 – Relationship between Land Cover (2018) and LUC 1-3 land in General Rural or Productive Rural Zones – COD and Cromwell Community Board Area

Total Central Otago District	Total LUC 1-3	Other LUC	Total Area *	Share on LUC 1-3	Mix of LUC 1-3
High Producing Exotic Grassland	63,781	151,483	215,264	30%	87%
Orchard, Vineyard or Other Perennial Crop	1,691	2,370	4,061	42%	2%
Short-rotation Cropland	1,915	1,977	3,893	49%	3%
Sub-Total Selected Agricultural	67,387	155,831	223,218	30%	92%
Other Land Cover	5,948	-	5,948	100%	8%
Total Land Cover *	73,336	155,831	229,166	32%	100%

Total Cromwell Community Board	Total LUC 1-3	Other LUC	Total Area *	Share on LUC 1-3	Mix of LUC 1-3
High Producing Exotic Grassland	5,535	17,901	23,436	24%	67%
Orchard, Vineyard or Other Perennial Crop	555	1,491	2,046	27%	7%
Short-rotation Cropland	500	473	972	51%	6%
Sub-Total Selected Agricultural	6,590	19,864	26,455	25%	79%
Other Land Cover	1,708	-	1,708	100%	21%
Total Land Cover *	8,298	19,864	28,163	29%	100%

Source: M.E Otago Indicative HPL Model 2020, NZLRI/NZ LCDB/Operative District Plans.

** Based on area within general or productive rural zones (excluding Rural Residential/Lifestyle Zones) and excluding protected areas and designated land.*

62 Figure 5 then shows the same breakdown for the Cromwell Community Board area (bottom table). Utilisation of LUC 1-3 land in the Rural Resource Area by agriculture is much lower than the regional or district average at 79%. This implies that 21%

[28] Excludes Rural Resource Areas 1-4 and the Rural Residential Zone.

or 1,708ha of LUC 1-3 land in the Rural Resource Area is potentially being under-utilised and could (assuming no other constraints to this land) be converted to productive activities to provide for agricultural sector growth. Orchards, vineyards or other perennial crops in the Cromwell Community Board area also have a below average dependence on LUC 1-3 land (just 27%, compared to 42% for the COD average). This may mean that the particular crops grown in Cromwell Community Board area are less suited to LUC 1-3 compared to crops grown elsewhere in the district and that other factors are more important[29], and/or those crops could be making better use of LUC 1-3 land than they are currently (all else being equal).

Indicative HPL and the Significance of this on Shannon Farm

63 I have combined the LUC (NZLRI), LCDB, rural general/rural productive zone area in operative district plans, protected area and designated area spatial datasets described above to indicatively identify what might be considered HPL in Otago and that would be available for land-based primary production (already or in the future). While some HPL may exist in operative Rural Residential or Rural Lifestyle zones (including in COD), this is excluded for the purpose of my analysis. The indicative HPL area includes all current high producing grass land, orchard, vineyard, perennial crop or short rotation crop land (so includes the areas that have proven to be most commonly converted to new orchards), and all LUC 1-3 land, not already occurring within these agricultural land covers.

64 My estimate of the extent of indicative HPL is by no means comprehensive. My desktop approach is limited to spatial data that is readily available. It does not explicitly factor in climate, rainfall, water availability or other factors relevant to defining land as HPL (such as the data contained in the GrowOtago database for example). It does however capture soil and slope (through the LUC dataset), and indirectly the areas where climate, rainfall, water availability etc currently sustain selected types of agriculture. It is an approximation that I consider useful for the purpose of this plan change – where a big-picture view is taken and is complementary to the 'Potential Horticultural Land' spatial assessment for COD prepared by the AgriBusiness Group (2018). I discuss this further below.

65 Attachment 4 shows a map of indicative HPL for Otago Region. In total, M.E indicatively identify just under 900,000ha of HPL in Otago. The majority (43%) is located within Clutha District, where the HPL areas makes up 60% of total district area. This is followed by COD (229,166ha or 26% of the regional HPL total). In COD, the area of indicative HPL makes up 23% of the total district extent.

66 Attachment 5 shows a map of indicative HPL for the Cromwell Community Board area. This area contains an indicative 28,163ha of HPL within the Rural Resource

[29] Factors by importance for horticulture are discussed further in Mr Edward's evidence.

Area (and not otherwise protected or designated)[30]. This makes up 12% of the total HPL estimated for COD in the Rural Resource Area. The HPL indicatively in Cromwell Community Board area makes up just 3% of the total estimated regional resource.

67 Attachment 6 contains a map of the indicative HPL as it sits above the proposed PC14 structure plan. It separately shows the component of the indicative HPL that comprises LUC 1-3 land (and may or may not contain agricultural land cover at present), and the component of HPL that does not contain LUC 1-3 but was included because it contains one or more of the selected agricultural land covers (as at 2018). It shows the overlap of indicative HPL with the proposed Rural Lifestyle Areas 1-5. The results are summarised in Figure 6.

Figure 6 – Impact of Loss of Indicative HPL on Shannon Farm for Non-primary production Land Use

Community Board	Ha			
	Total Combined Indicative HPL Resource	Total Area of indicative HPL on Shannon Farm	Area of indicative HPL on Shannon Farm proposed for non-primary production use	Area of indicative HPL on Shannon Farm proposed for non-primary production use as a share of resource
Cromwell Community	28,163	94	65	0.23%
Maniototo Community	100,684	-	-	0.00%
Teviot Valley Community	42,426	-	-	0.00%
Vincent Community	57,894	-	-	0.00%
Sub-total Central Otago Distict	229,166	94	65	0.03%
Total Otago Region	897,735	94	65	0.01%

Source: M.E Otago Indicative HPL Model 2020, NZLRI/NZ LCDB/Operative District Plans.

68 Figure 6 shows that based on my approach, there is indicatively 94ha of HPL on Shannon Farm. 29ha of this will be used for the proposed cherry farm extension. 65ha falls within areas identified for development as Rural Lifestyle Areas 1-5) and would therefore represent a loss of productive potential for that HPL when fully occupied.

69 This loss would equate to 0.23% of the total indicative HPL resource mapped by M.E in the Cromwell Community Board area. It would equate to a 0.03% loss of the total indicative HPL resource mapped in COD and a 0.01% loss across Otago Region.

70 Returning to the conclusion of the s42a report: of the 142ha of land proposed for rural residential and rural lifestyle development, less than half (65ha or 46%) is suitable for horticultural or other land-based primary production based on my

[30] This is based on the latest operative district plan zones (data supplied April 2020 by CODC). Note, this zoning data is more up to date than zoning data relied on in my Demand and Supply report (that data was based on zoning as at October 2017).

estimates of HPL. The loss of 65ha of indicatively productive land is immaterial (not 'significant') in percentage terms when compared to the total resource, although my analysis does not measure the significance of the loss purely in terms of land with horticultural growth potential (this will be a subset of the indicative HPL resource not already used for horticulture). I have discussed this issue below based on the AgriBusiness Group report.

71 Contrasting my results, the evidence of Mr Edwards and Mr Larsen shows that the site does not have sufficient water to develop any land beyond that already identified for the cherry farm extension for additional commercial horticulture (or other commercial primary production)[31]. These findings mean that the 65ha of indicative HPL I have identified on Shannon Farm in the Rural Lifestyle Areas may not in fact qualify as HPL at all in a commercial sense. My approach does not factor in water availability on a site by site basis. The same limitation of available water may apply to other areas of HPL I have identified.

72 In simple terms, my indicative HPL could be considered an upper estimate in that regard. In primary production terms, the loss of commercially productive land could be between 0ha (Mr Edwards) and 65ha, although I would recommend that greater weight be given to Mr Edwards' conclusion on the basis that a site specific assessment will always be more robust than a high-level desktop analysis such as I have carried out.

Comparison of my Indicative HPL Extent with Estimated Horticultural Land (AgriBusiness)

73 The AgriBusiness report states that it was developed to inform the CODC District Plan review as an evidence basis for appropriate zoning consideration to protect valuable horticultural land in the proposed District Plan. The report mentions the Cromwell Masterplan and according to Horticulture New Zealand was also used to inform that process.

74 The output of the report is a map of potential horticultural land in COD. I have included a copy of the maps as Attachment 7 of my evidence. Like my analysis, it compiles spatial data in GIS. The data relied on two main mapping variables described as "*areas of minimal frosts in September*" and slopes limited to no more than 25 degrees – so different sources of data than I relied on. Other considerations in the mapping were irrigation and water aquifer areas (but not a mapped variable) and a distance no further than 20km from a town and "*soil types suitable for horticulture*", although these were not specified. The report cautions that some areas had not been validated locally.

[31] Mr Edward does consider that with onsite water storage, individual rural lifestyle lots could undertake "domestic production" on the land not otherwise used for the dwelling and adjoining curtilage.

75 Without the final GIS file from this study[32], it is difficult to accurately compare the land with horticulture potential with my estimates of land with potential for land-based primary production, inclusive of horticulture. There appear to be significant areas of overlap with my results. My maps include more land in some locations which is to be expected given that it is not limited to horticulture potential. There are however some areas identified for horticulture potential that my analysis has not identified.

76 The area of horticulture potential specifically inside the PC14 area is not quantified (as this is not the purpose of the report), but appears to include all of the North and East Gullies and the upper reaches of the East Gully (within the ONL). It includes the 94ha of indicative HPL that I have identified and significantly more.

77 The total area of potential horticulture land in COD in the AgriBusiness Report is stated at 164,650ha[33]. No attempt was made to exclude areas where land use, zoning or other protection would preclude the potential for horticultural use (such as Hyland Park or the Chaffer Beetle conservation area in Cromwell), so is an upper limit, other limitations notwithstanding. Nonetheless, even if the entire PC14 site less the cherry farm extension (i.e. 244ha less 29ha = 215ha) was excluded from the maps, the reduction in the horticultural potential land would be -0.1% of the district total.

78 The AgriBusiness Group report highlights that there is significant potential for horticultural activity growth elsewhere in the Cromwell Basin and district and the loss of some of the land on Shannon Farm for rural residential and rural lifestyle development is less than minor in that context.

Response to submissions

James Dicey (#28), Robin Dicey (#18), Andrew McFarlane (#52), Horticulture New Zealand (#38), Rockburn Wines (#72)

79 These submissions variously submit that PC14 would result in the loss of a substantial amount of versatile soil or valuable potentially productive horticultural land due to residential subdivision. As discussed above, I estimate 65ha of indicative HPL would be lost in the proposed Rural Resource Area 5. If additional water could be sourced to support commercial productive activity, the loss of 65ha would be very minimal compared to the total indicative HPL resource in the Cromwell Community Board/ward area.

[32] I have not sought this data.

[33] This compares with my total HPL indicative area of 229,166ha in COD.

80 For the estimated 2,046ha of existing orchard, vineyard or other perennial crop land cover in the Rural Resource Area of the Cromwell Community Board area (2018), an additional 65ha would represent growth of just 3%. When measured against this aggregated sector, this potential growth (and therefore opportunity cost) is minor.

81 According the submission of Horticulture New Zealand, there is 364ha of fruit orchards in the wider Cromwell Basin (the extent of which is not mapped in their submission, but it is the orchards that collectively supply the "*Ripponvale Packhouses*"). An additional 65ha would represent growth of 18%. When measured against the orchard-only sector, this assumed growth (and therefore opportunity cost) could be considered in a local context as more than minor. However, in Mr Edwards' expert opinion, this land cannot be supplied with sufficient water for it to be used productively at a commercial scale. This implies that the potential of the land for commercially viable orcharding is overstated by these submitters. No commercial productive potential = no opportunity cost for commercial production arising from PC14.

82 I also disagree with Horticulture New Zealand's conclusion that, in respect of the loss of potential productive land, the proposed plan change puts the economic and social benefits of horticulture to the District at "*serious risk*". PC14 confirms that a significant area of new cherry farm will be planted and only pockets of existing marginally viable summer fruit (status quo) will be removed (as covered by Mr Edwards). This is a net gain in productive output that will add social and economic benefit, not reduce it. Further, an opportunity cost (even if able to be substantiated) cannot risk, damage or diminish the <u>current</u> industry[34].

83 Many of these submissions also submit that PC14 acts against the Cromwell Masterplan Spatial Framework which they assert seeks to preserve rural land and ensure residential development is confined to defined areas[35]. As discussed above, there is not sufficient capacity in operative district plan zones to meet projected demand for those households seeking to live outside of the Cromwell and satellite urban areas. There is market demand for rural residential and rural lifestyle living in the Cromwell ward and in my view, the Spatial Framework does not adequately provide for that growth. The Masterplan and Spatial Plan was extensively focussed on dealing with the future growth of the Cromwell <u>urban</u> area.

[34] Mr Humpheson and Mr Giddens addresses localised reverse sensitivity effects and these are considered to be appropriately avoided or mitigated.

[35] Addressed in Objective 2, points 1,4 and 6 and Objective 7, point 4 of the Spatial Framework.

Conclusion

84 This evidence provides additional information on the extent and location of indicative HPL, taking a desktop and wider Cromwell, ward and district view. The approach I have used in that analysis factors in many of the issues raised by submitters when discussing the productive potential of the Ripponvale area. That is, productive potential is not limited to LUC 1-3 soils but includes local climate and other conditions necessary to support a viable commercial orchard, as evidenced by the existing horticultural activities in the area.

85 My analysis suggests a maximum potential opportunity cost to develop 65ha of indicative HPL for new horticultural activities (net of the 29ha of indicative HPL that *is* identified in the structure plan for a cherry orchard). However, my analysis does not factor in water availability. I rely on Mr Edwards' evidence which states that the proposed cherry farm extension will require (allowing for some contingency) all of the water available on Shannon Farm. Without additional water, the rest of the land in the Rural Lifestyle Areas of the structure plan cannot practically sustain more productive activity of a commercial nature. On that basis, there may be no opportunity costs for commercial horticultural development from using that land for the development of dwellings.

86 My definition of lots sized 2,000sqm-1ha as 'rural residential' was for the purpose of my Demand and Supply Assessment and not for the purposes of an assessment in the context of the operative district plan. Irrespective of the terminology, there is strong demand growth for dwellings in the Cromwell ward outside of the Cromwell urban area. In keeping with past supply patterns it is expected that a significant portion of that demand will be for lots sized between 2,000sqm-1ha in a rural setting as well as larger rural lifestyle lots.

87 Current vacant zoned capacity in the area outside of urban Cromwell is not sufficient to provide for projected medium to long-term demand growth and nor will the Cromwell urban area provide for future growth of larger lot residential properties. Additional zoned capacity in the rest of the ward is required to cater for growth and PC14 could provide for a portion of that.

Dated this 12 May 2020

Natalie Dianne Hampson

Attachment 1 - Change in Selected Agricultural Land Cover Hectares 2001 to 2018 in Otago Region by TA 2001-2018 (LCDB)

TA	Selected Agricultural Land Cover	2001 (ha)	2018 (ha)	2001-18 (n)	2001-18 (%)	Share of Growth
Central Otago District	High Producing Exotic Grassland	209,849	220,179	10,330	5%	45%
	Orchard, Vineyard or Other Perennial Crop	3,616	4,766	1,150	32%	5%
	Short-rotation Cropland	4,210	4,116	- 94	-2%	0%
	Sub-Total	217,675	229,061	11,386	5%	49%
Clutha District	High Producing Exotic Grassland	370,456	374,841	4,385	1%	19%
	Orchard, Vineyard or Other Perennial Crop	36	58	22	61%	0%
	Short-rotation Cropland	1,684	1,807	123	7%	1%
	Sub-Total	372,176	376,706	4,530	1%	20%
Dunedin City	High Producing Exotic Grassland	103,976	107,627	3,650	4%	16%
	Orchard, Vineyard or Other Perennial Crop	101	122	21	21%	0%
	Short-rotation Cropland	411	404	- 7	-2%	0%
	Sub-Total	104,488	108,152	3,664	4%	16%
Queenstown Lakes District	High Producing Exotic Grassland	46,608	48,200	1,592	3%	7%
	Orchard, Vineyard or Other Perennial Crop	338	372	34	10%	0%
	Short-rotation Cropland	1,523	1,545	23	1%	0%
	Sub-Total	48,468	50,117	1,649	3%	7%
Waitaki District *	High Producing Exotic Grassland	127,382	129,200	1,818	1%	8%
	Orchard, Vineyard or Other Perennial Crop	14	104	90	637%	0%
	Short-rotation Cropland	6,539	6,563	25	0%	0%
	Sub-Total	133,934	135,867	1,933	1%	8%
Otago Region	**High Producing Exotic Grassland**	**858,271**	**880,046**	**21,775**	**3%**	**94%**
	Orchard, Vineyard or Other Perennial Crop	**4,104**	**5,421**	**1,317**	**32%**	**6%**
	Short-rotation Cropland	**14,367**	**14,436**	**69**	**0%**	**0%**
	Sub-Total	**876,742**	**899,904**	**23,161**	**3%**	**100%**

*Source: NZ LCDB v5, M.E. * Area within Otago Region.*

Attachment 2 – Distribution of Total LUC 1-3 Class Land in Otago Region by TA (NZLRI)

District / Ward / Community Board	1 (ha)	2 (ha)	3 (ha)	Total LUC 1-3 (ha)	Total LUC 1-3 as Share of Region	Total Area (ha)	Total LUC 1-3 as Share of Total Area
Central Otago District	-	**233**	**78,769**	**79,002**	**20%**	**996,848**	**7.9%**
Cromwell Community	-	-	9,971	9,971	3%	292,040	3.4%
Maniototo Community	-	-	40,090	40,090	10%	267,597	15.0%
Teviot Valley Community	-	233	4,892	5,125	1%	131,498	3.9%
Vincent Community	-	-	23,817	23,817	6%	305,712	7.8%
Clutha District	-	**17,253**	**172,110**	**189,363**	**48%**	**636,941**	**29.7%**
Balclutha Ward	-	978	6,753	7,731	2%	13,140	58.8%
Bruce Ward	-	6,668	7,614	14,281	4%	89,011	16.0%
Catlins Ward	-	-	14,339	14,339	4%	107,344	13.4%
Clinton Ward	-	390	40,366	40,755	10%	83,970	48.5%
Clutha Valley Ward	-	427	42,408	42,835	11%	63,974	67.0%
Kaitangata-Matau Ward	-	2,199	3,489	5,688	1%	16,371	34.7%
Lawrence-Tuapeka Ward	-	962	13,822	14,784	4%	125,675	11.8%
West Otago Ward	-	5,631	43,319	48,950	12%	137,456	35.6%
Dunedin City	**3,082**	**7,436**	**21,626**	**32,144**	**8%**	**335,031**	**9.6%**
Dunedin City Urban Area	-	-	455	455	0%	7,573	6.0%
Mosgiel-Taieri Community	3,082	7,020	7,803	17,905	5%	61,403	29.2%
Otago Peninsula Community	-	-	546	546	0%	12,189	4.5%
Saddle Hill Community	-	-	1,746	1,746	0%	10,519	16.6%
Strath Taieri Community	-	-	9,283	9,283	2%	183,909	5.0%
Waikouaiti Coast Community	-	416	1,781	2,197	1%	50,961	4.3%
West Harbour Community	-	-	13	13	0%	8,476	0.1%
Queenstown Lakes District	-	**3,169**	**17,639**	**20,808**	**5%**	**937,520**	**2.2%**
Wakatipu-Arrowtown Wards	-	3,169	7,591	10,760	3%	479,096	2.2%
Wanaka Community	-	-	10,048	10,048	3%	458,423	2.2%
Waitaki District	-	**19,177**	**53,064**	**72,241**	**18%**	**291,274**	**24.8%**
Corriedale and Oamaru Wards	-	14,423	41,786	56,208	14%	159,165	35.3%
Waihemo Community	-	4,755	11,278	16,033	4%	132,109	12.1%
Total Otago Region	**3,082**	**47,269**	**343,208**	**393,559**	**100%**	**3,197,614**	**12.3%**

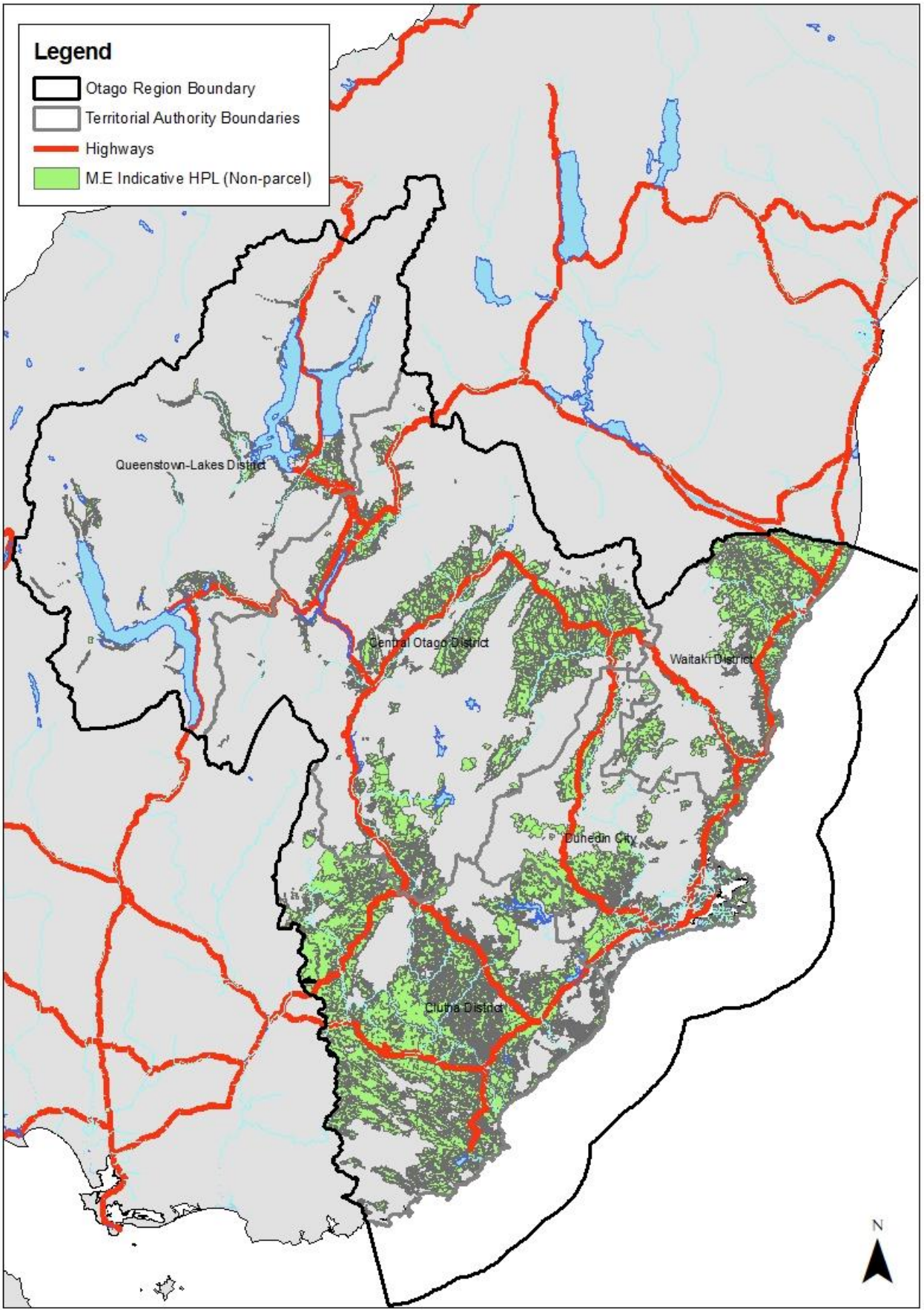
Source: NZLRI, M.E

Attachment 3 - Dependence of Agricultural Land Cover on LUC 1-3 in Otago Region (Spatial Overlap)

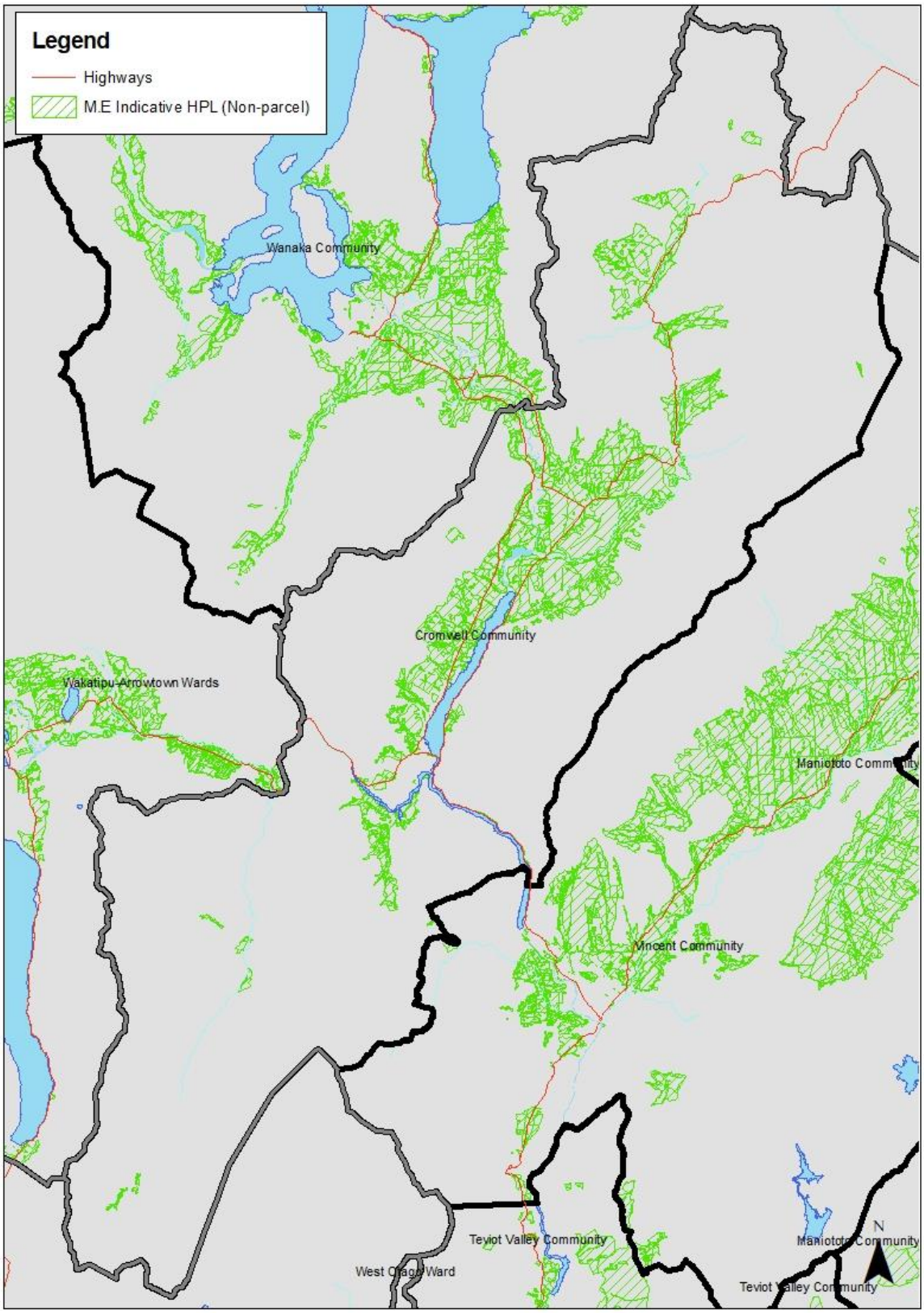
Land Cover Name (2018)	Hectares						Percentage Share						
	LUC 1	LUC 2	LUC 3	Total LUC 1-3	Othe LUC	Total LUC Area	LUC 1	LUC 2	LUC 3	Total LUC 1-3	Othe LUC	Total LUC Area	Total LUC 1-3
High Producing Exotic Grassland	2,435	38,355	293,908	334,699	519,639	854,338	0%	4%	34%	39%	61%	100%	90%
Orchard, Vineyard or Other Perennial Crop	70	74	2,009	2,153	2,533	4,686	1%	2%	43%	46%	54%	100%	1%
Short-rotation Cropland	35	2,621	7,743	10,400	3,452	13,852	0%	19%	56%	75%	25%	100%	3%
Sub-Total Selected Agricultural Land Covers	2,541	41,050	303,661	347,251	525,625	872,876	0%	5%	35%	40%	60%	100%	93%
Broadleaved Indigenous Hardwoods	13	30	467	510	-	510	2%	6%	92%	100%	0%	100%	0%
Deciduous Hardwoods	29	355	1,538	1,922	2	1,924	2%	18%	80%	100%	0%	100%	1%
Depleted Grassland	-	4	90	94	25	119	0%	3%	75%	79%	21%	100%	0%
Exotic Forest	42	608	7,772	8,422	-	8,422	0%	7%	92%	100%	0%	100%	2%
Fernland	-	-	96	96	2	98	0%	0%	98%	98%	2%	100%	0%
Forest - Harvested	0	22	686	708	2	710	0%	3%	97%	100%	0%	100%	0%
Gorse and/or Broom	4	123	1,506	1,633	-	1,633	0%	8%	92%	100%	0%	100%	0%
Gravel or Rock	3	34	164	202	1	202	1%	17%	81%	100%	0%	100%	0%
Herbaceous Freshwater Vegetation	-	49	974	1,024	-	1,024	0%	5%	95%	100%	0%	100%	0%
Herbaceous Saline Vegetation	-	41	25	66	-	66	0%	62%	38%	100%	0%	100%	0%
Indigenous Forest	-	17	644	661	1	662	0%	3%	97%	100%	0%	100%	0%
Landslide	-	1	2	2	-	2	0%	34%	66%	100%	0%	100%	0%
Low Producing Grassland	8	130	6,759	6,897	127	7,024	0%	2%	96%	98%	2%	100%	2%
Manuka and/or Kanuka	19	36	909	964	-	964	2%	4%	94%	100%	0%	100%	0%
Matagouri or Grey Scrub	2	6	205	212	-	212	1%	3%	97%	100%	0%	100%	0%
Mixed Exotic Shrubland	-	20	320	340	91	431	0%	5%	74%	79%	21%	100%	0%
Sand or Gravel	-	24	47	71	-	71	0%	33%	67%	100%	0%	100%	0%
Tall Tussock Grassland	-	-	753	753	3	756	0%	0%	100%	100%	0%	100%	0%
Sub-total Other Land Covers	119	1,499	22,958	24,576	254	24,830	0%	6%	92%	99%	1%	100%	7%
Total Land Covers *	2,660	42,549	326,618	371,827	525,879	897,706	0%	5%	36%	41%	59%	100%	100%
Areas Outside of LCDB Extent	-	22	8	29	-	29	0%	73%	27%	100%	0%	100%	0%
Total LUC Area	2,660	42,571	326,626	371,856	525,879	897,735	0%	5%	36%	41%	59%	100%	100%

Source: M.E Otago Indicative HPL Model 2020, NZLRI, NZ LCDB

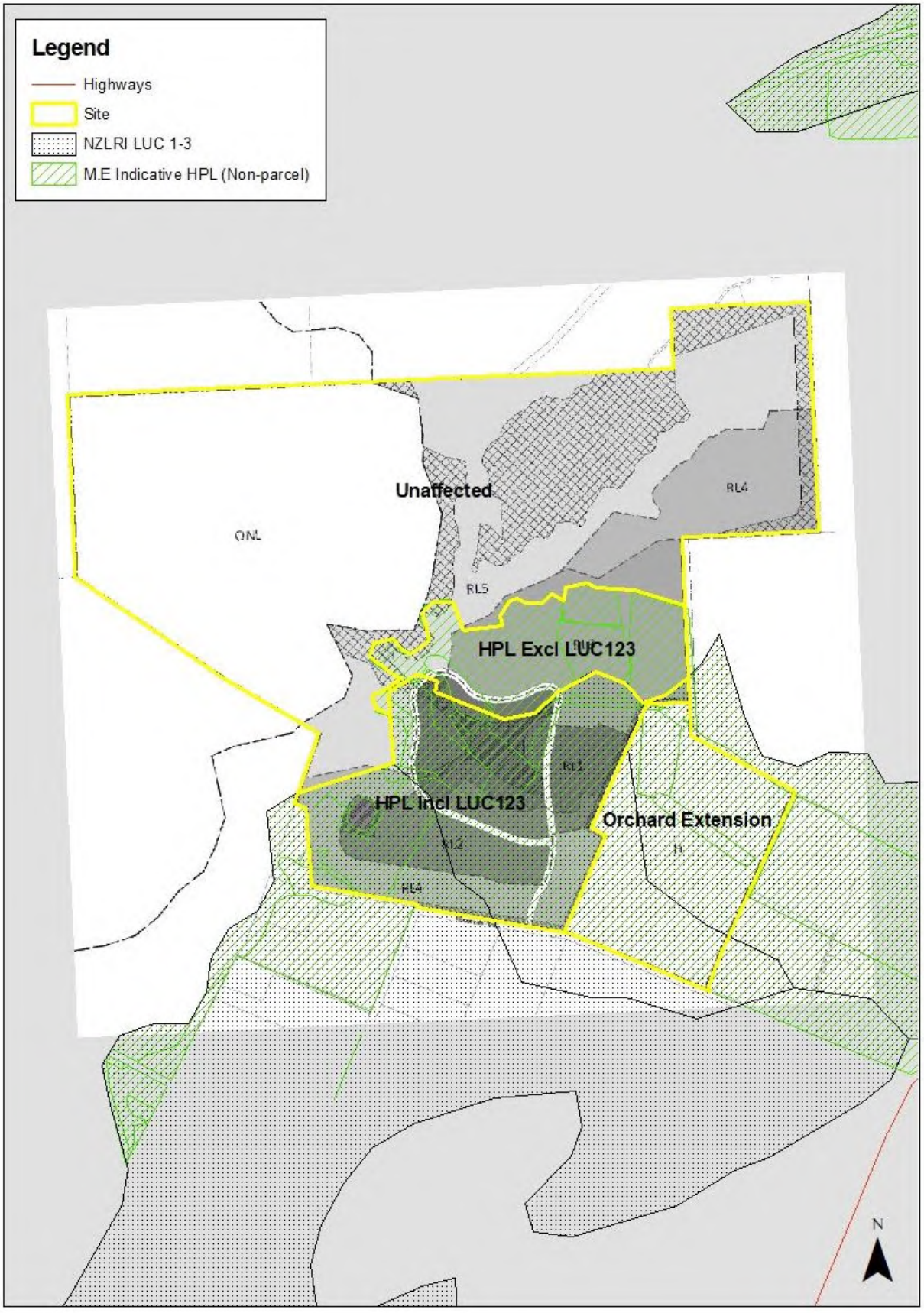
Attachment 4 - Indicative (Non-Parcel Defined) HPL in Otago Region



Attachment 5 - Indicative (Non-Parcel Defined) HPL in Cromwell Community Board Area



Attachment 6 - Indicative (Non-Parcel Defined) HPL in Shannon Farm



Attachment 7 – Potential Horticulture Land – Central Otago District Council. Prepared for HortNZ by The Agribusiness Group, December 2018.

"Achieving Outcomes by Building Capability"

The AgriBusiness Group™

Potential Horticulture Land

Central Otago District Council

Prepared for HortNZ

Prepared by The AgriBusiness Group

December 2018

Contents

1 Potential Orchard Mapping

1.1 Background

The Otago Council is currently in the process of developing a Master Plan for Cromwell. The information in this report was developed to inform the Central Otago District Council (CODC) District Plan review, of areas which would be most suitable for horticulture in the District. This mapping can provide the evidence basis for appropriate zoning consideration to protect valuable horticultural lands in the proposed District Plan.

1.2 Method

1. Meet with Orchardists in Central Otago to understand limitations to Orchard location
2. Construct GIS map layers that identify potential and existing orchard areas
3. Ground truth areas from the map with local growers and Central Otago District Council
4. Produce a report detailing the findings

1.1.1 Orchardist meeting (7th August 2018) – Key messages from orchardists

It is feasible to have an orchard in a wide range of landscapes with elevations to 900 meters and slopes greater than 20 degrees, however these types of developments come at a greater cost and risk. Therefore, what are the constraining factors for someone wanting to develop an Orchard? Growers agreed that the following were the criteria:

- Frosts
  - Budburst is a sensitive part of the production season, therefore, areas of minimal frosts in September were added as a mapping variable.
- Slope
  - Increasing from a 20 towards a 30-degree slope led to increasing management difficulties and costs, therefore mapping limited the slope to 21 to 25 degrees
- Other considerations from the meeting
  - Important that labour does not need to travel more than 15 to 20 kilometres
  - Importance of accommodation infrastructure
  - Impacts of reverse sensitivity as a result of urban expansion to Horticulture areas.
  -

Feedback from growers was that water availability is also essential and that access to water should be considered as one of the mapping variables. However, there is currently uncertainty around the regional planning framework and future water consenting. Therefore, it was difficult to find reliable information regarding access to water in the future. Therefore, water availability was considered, but not used as one of the mapping variables.

1.1.2 Construction of map layers

The areas where the GPS layers were of less than 25 degrees of slope and had the least frost days were also less than 20 kilometres from a town, had good water availability and soil types suitable for horticulture. These estimates have not been validated locally so caution is advised when considering areas north of Saint Bathans, north of Tarras and east of Rigney for horticulture.

1.3 Mapping

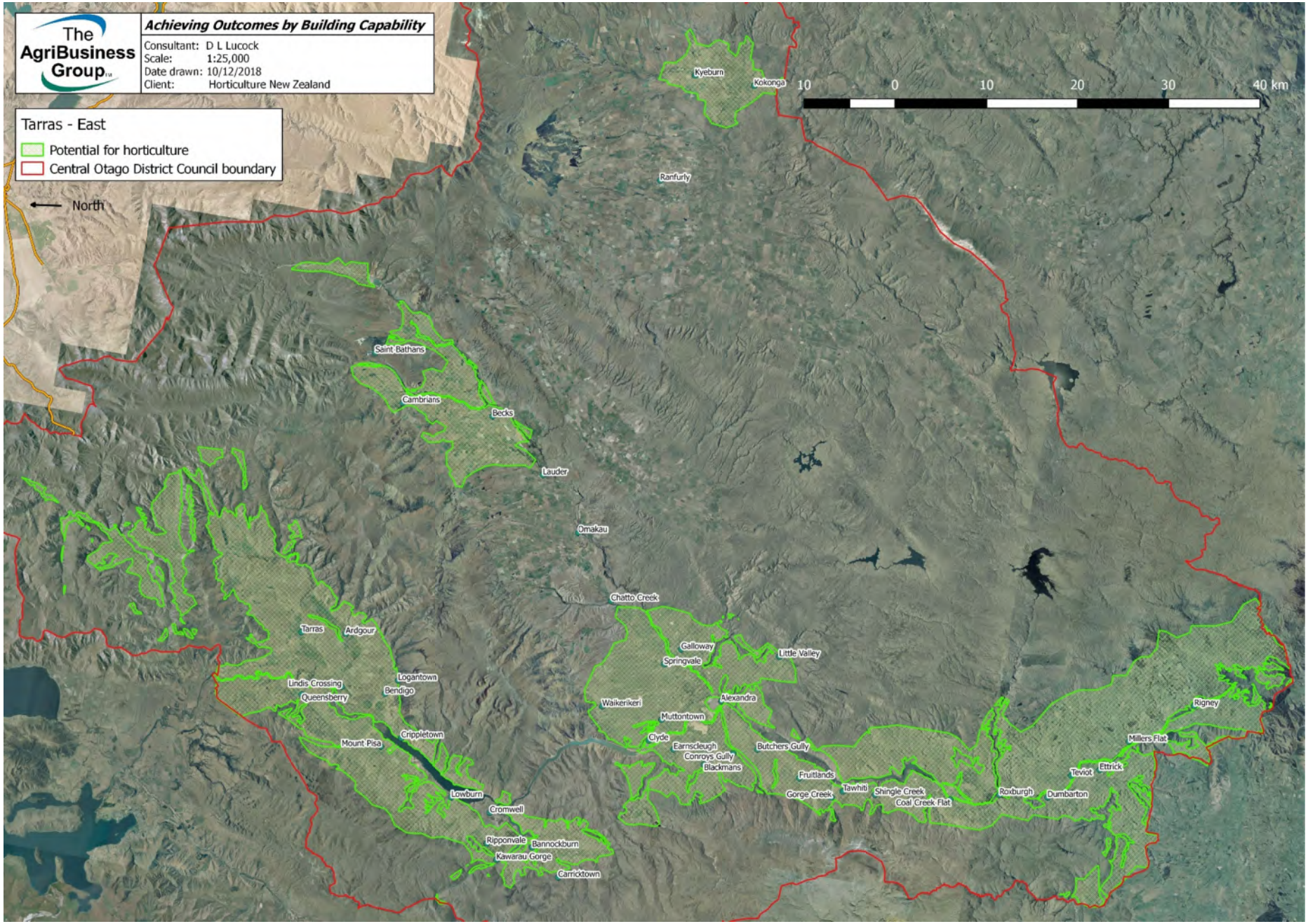
Following discussions with Orchardists in Central Otago, as discussed above, the subsequent GIS layers were used to identify potential areas suitable for Orchards.

- Areas of least number of frost days in September (within blue line on map).

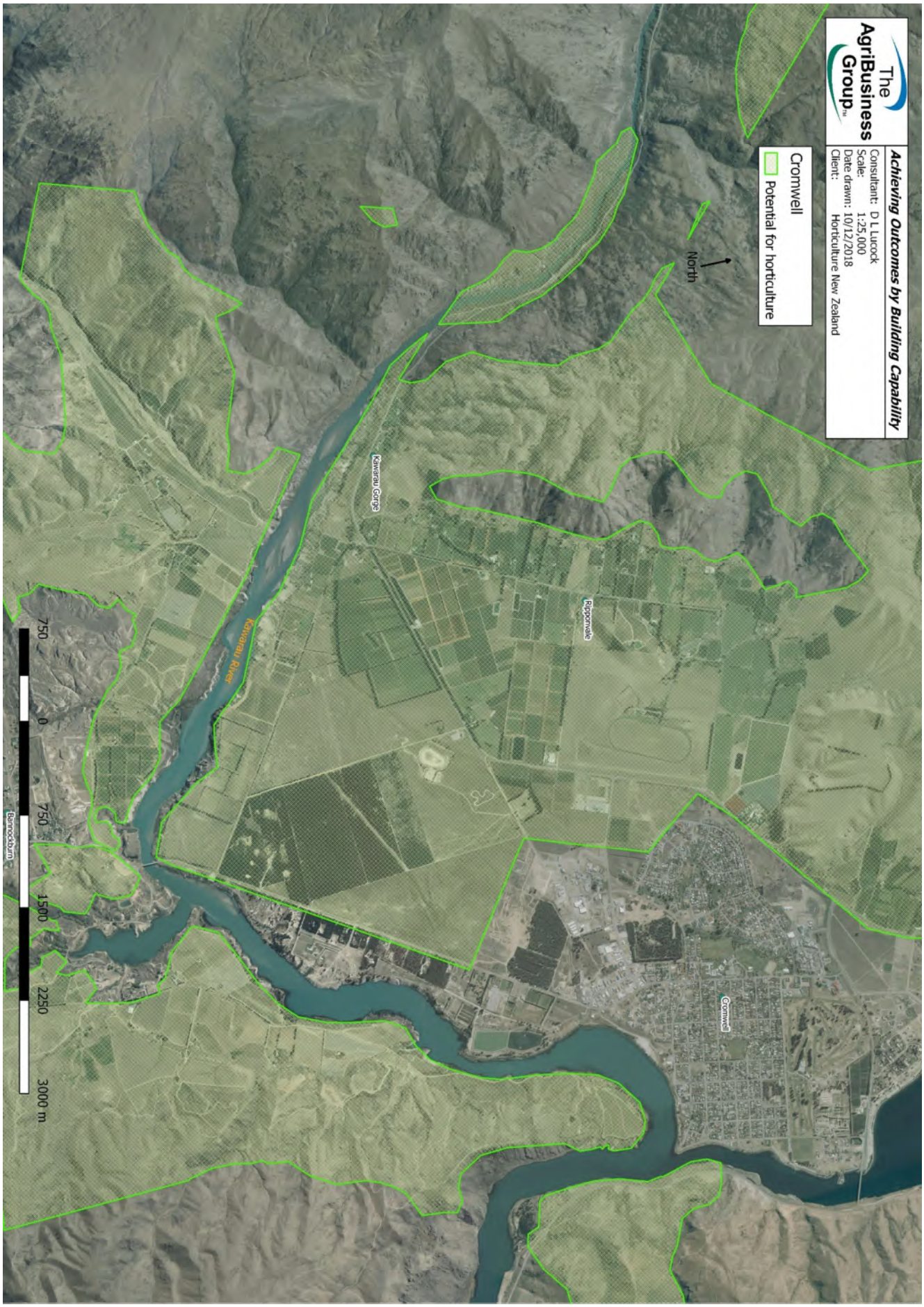
- Areas with slope less than 25 degrees. This is approximate as there will be steeper gullies within this area.
- Areas with water availability. This is depicted by both irrigation and water aquifers on the map. Once again this is approximate as there is currently uncertainty regarding water availability in some areas.

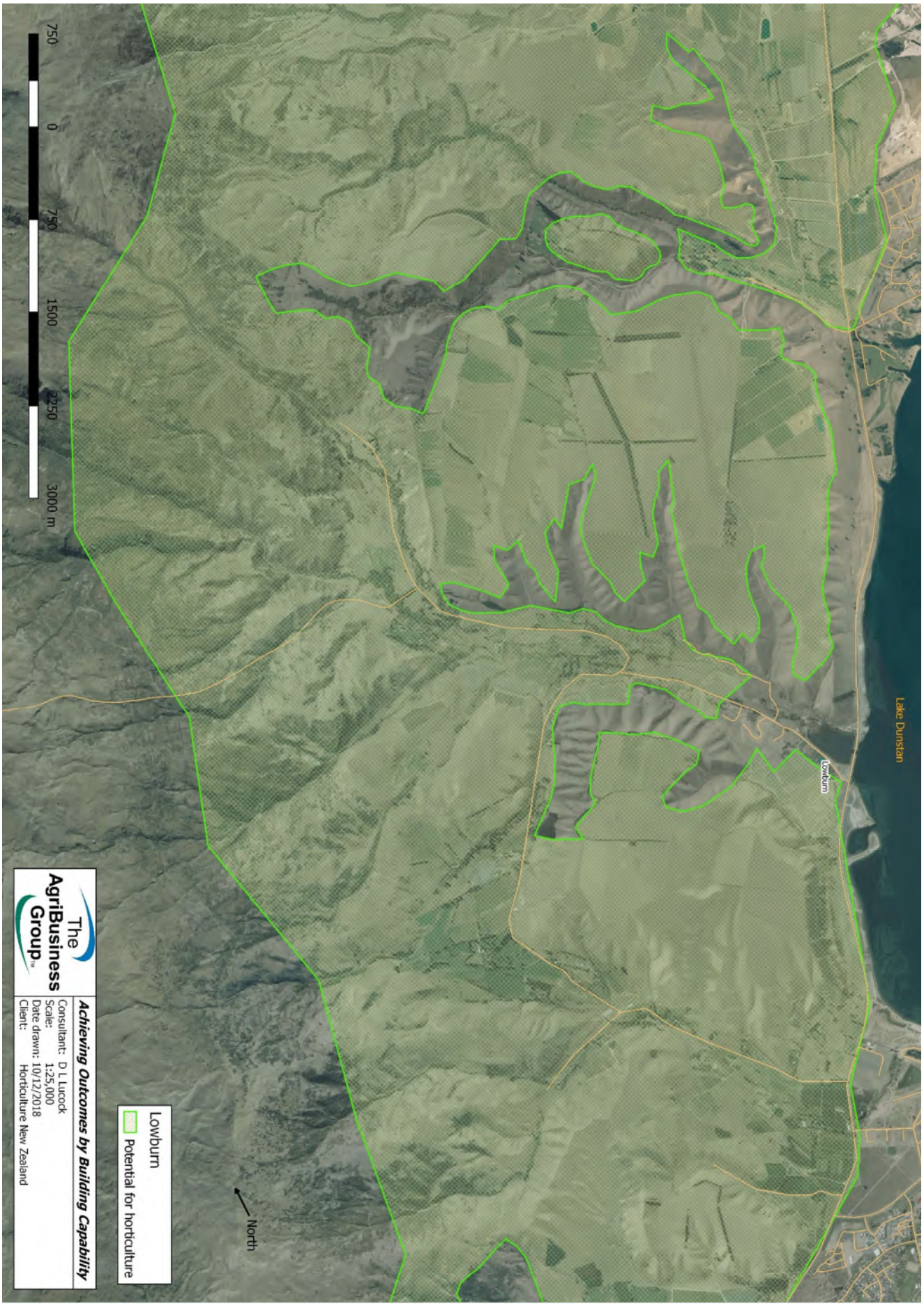
Under this method the potential horticultural area is estimated to be no more than 164,650 hectares or 16.5% of the total Central Otago District Council area. This area is shown on the maps below as the *Potential for Horticulture* green layer.

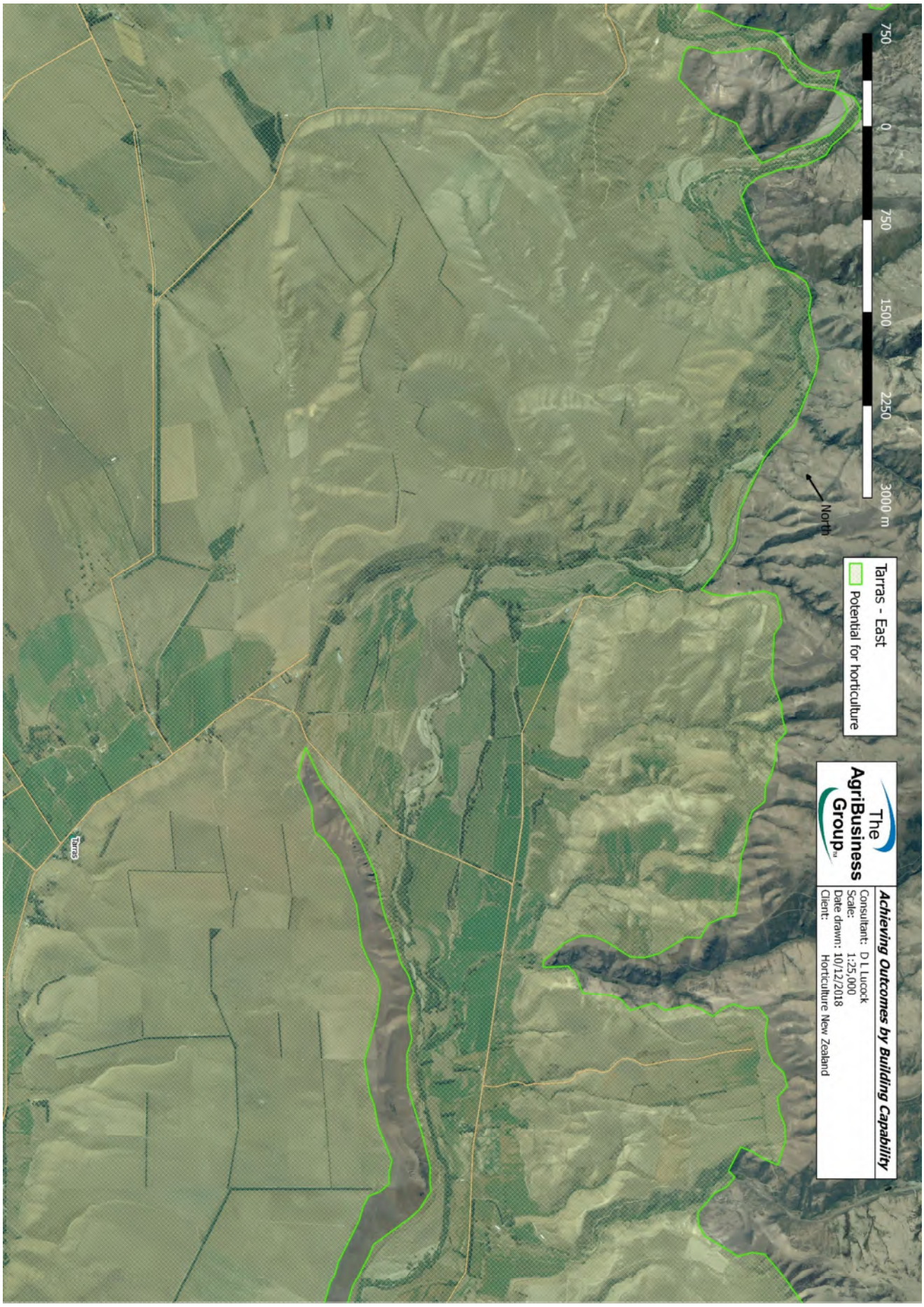
The map scale is accurate at A3.


The AgriBusiness Group
Achieving Outcomes by Building Capability
Consultant: D L Lucock
Scale: 1:25,000
Date drawn: 10/12/2018
Client: Horticulture New Zealand
Tarras - East
Potential for horticulture
Central Otago District Council boundary
North
10 0 10 20 30 40 km
Kyeburn
Kokonga
Ranfurly
Saint Bathans
Cambrians
Becks
Lauder
Omakau
Chatto Creek
Tarras
Ardgour
Galloway
Springvale
Little Valley
Logantown
Lindis Crossing
Bendigo
Queensberry
Waikerikeri
Alexandra
Muttontown
Rigney
Cricklewood
Mount Pisa
Clyde
Earnscleugh
Conroys Gully
Blackmans
Butchers Gully
Millers Flat
Fruitlands
Ettrick
Teviot
Lowburn
Cromwell
Gorge Creek
Tawhiti
Shingle Creek
Coal Creek Flat
Roxburgh
Dumbarton
Ripponvale
Bannockburn
Kawarau Gorge
Carricktown

Kawarau River
Bannockburn
750
0
750
1500
2250
3000 m
North
Bannockburn
Potential for horticulture
The AgriBusiness Group
Achieving Outcomes by Building Capability
Consultant: D L Lucock
Scale: 1:25,000
Date drawn: 10/12/2018
Client: Horticulture New Zealand


The AgriBusiness Group
Achieving Outcomes by Building Capability
Consultant: D L Lucock
Scale: 1:25,000
Date drawn: 10/12/2018
Client: Horticulture New Zealand
Cromwell
Potential for horticulture
North
Kawarau Gorge
Kawarau River
Bannockburn
Cromwell
750
0
750
1500
2250
3000 m


750
0
750
1500
2250
3000 m
Lake Dunstan
Lowburn
North
Lowburn
Potential for horticulture
The AgriBusiness Group
Achieving Outcomes by Building Capability
Consultant: D L Lucock
Scale: 1:25,000
Date drawn: 10/12/2018
Client: Horticulture New Zealand


750
0
750
1500
2250
3000 m
North
Tarras - East
Potential for horticulture
Tarras
The AgriBusiness Group
Achieving Outcomes by Building Capability
Consultant: D L Lucock
Scale: 1:25,000
Date drawn: 10/12/2018
Client: Horticulture New Zealand


The AgriBusiness Group
Achieving Outcomes by Building Capability
Consultant: D L Lucock
Scale: 1:25,000
Date drawn: 10/12/2018
Client: Horticulture New Zealand
Tarras - West
Potential for horticulture
North
750
0
750
1500
2250
3000 m
Tarras