BEFORE HEARING COMMISSIONERS APPOINTED BY THE CENTRAL OTAGO DISTRICT COUNCIL

IN THE MATTER OF	The Resource Management Act 1991 (**RMA** or **the Act**)
AND	
IN THE MATTER OF	Hearing of Submissions and Further Submissions on Proposed Plan Change 19 (**PC19**) to the Central Otago District Plan (**CODP** or **the District Plan**)
AND	
IN THE MATTER OF	Submissions and Further Submissions on Proposed Plan Change 19 by the Doug Jones Family Trust and Searell Family Trust No. 2 (submitter #82)

STAGE 2 – ZONING HEARING
EVIDENCE OF RICHARD FORD ON BEHALF OF THE DOUG JONES FAMILY TRUST AND SEARELL FAMILY TRUST NO. 2

Dated: 16 May 2023

Presented for filing by:
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INTRODUCTION

1. My full name is Richard Andrew Ford and I am a Licensed Cadastral Surveyor at Landpro Limited in Cromwell. This is a position I have progressed towards within the company since beginning as a graduate in 2012.

2. I hold a Bachelor of Surveying with First Class Honours (2013) as conferred by the University of Otago. I am also a voting member of Survey and Spatial New Zealand (MS+SNZ) and possess a license to undertake cadastral surveys as issued by the Cadastral Surveyors Licensing Board of New Zealand in 2017 and annually since.

3. My recent project work involves advising on and undertaking a number of residential and rural subdivisions across the Lower South Island. This includes preparing resource consent applications, undertaking engineering design, construction management and cadastral surveying.

4. Proposed development of the subject site has been a project I have been involved with since 2016.

5. Additionally, I have been a resident property owner in Bannockburn since 2016, so am very familiar with the local context.

6. I have read the Environment Court's Code of Conduct and agree to comply with it. My qualifications as an expert are set out above. The matters addressed in my evidence are within my area of expertise, however where I make statements on issues that are not in my area of expertise, I will state whose evidence I have relied upon. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed in my evidence.

7. Furthermore, I aim to uphold the principles and ethics of Survey and Spatial New Zealand and adhere to their associated Code of Conduct.

SCOPE OF EVIDENCE

8. My statement provides a brief overview of the proposal and details the relevant engineering considerations regarding the proposed relief sought.

9. The structure of my is evidence focussed upon the following key areas:

(a) Description of site constraints and specific engineering design considerations

(b) Investigation of realistic yield considering site specific factors and comparison to a typical broad scale desktop model approach.

(c) Discussion of servicing constraints and possible solutions to indicate this is not an impediment to re-zoning.

10. In the course of preparing this statement I have reviewed the following engineering documents:

- NZS4404:2004 New Zealand Engineering and Subdivision Standards
- 2008 Central Otago District Council Addendum to NZS4404:2004
- Resource Management Act 1991
- Operative Central Otago District Plan 2008
- Plan Change 19 of the Central Otago District Plan
- s42A Part 2 Report authored by Liz White
- s42A Part 2 Appendix 2: Rationale Yield Analysis
- s42A Part 2 Report authored by Julie Muir

CONTEXT

11. D. J. Jones Family Trust and Searell Family Trust No. 2 (the submitter) have engaged my services to provide expert infrastructure advice in respect of their large vacant properties at 88 Terrace Street & Bannockburn Road, Bannockburn within the Central Otago District.

12. The submitter's properties consist of two parcels of land and are generally depicted in figure 1 below. The first parcel being legally described as Lot 4 DP 339137 and held within Record of Title 474127, and secondly the adjacent property to the North, legally described as Part Section 103 Block I Cromwell SD held in Record of Title OT16B/1179 (**Site/Subject Land**).

Figure 1 – Lot 4 DP 339137 (red) & Part Section 103 Block I Cromwell SD (blue)

13. The subject land is zoned Residential Resource Area (4) (**RRA(4)**) in the Operative Central Otago District Plan (ODP), which provides for a minimum allotment size of 1500m² and average of 2000m². Plan change 19 proposes a zone of LLRZ, with a minimum lot size of 2000m². Figure 2 below depicts the underlying respective zone with respect to the property boundary and area of relief sought.

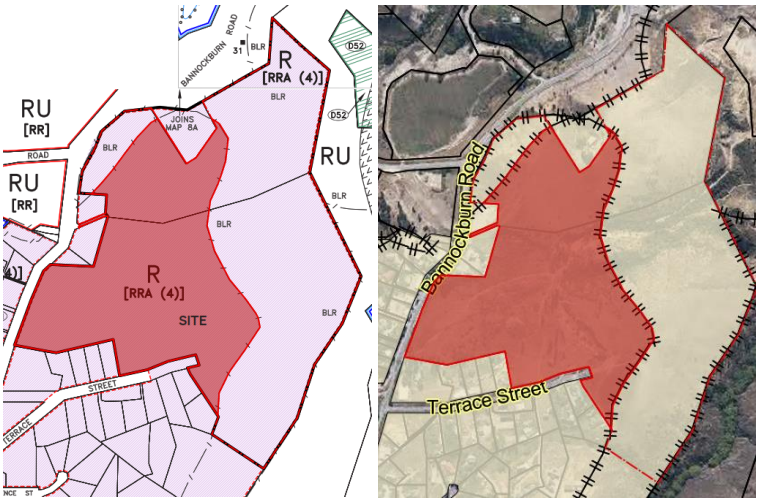

Figure 2 – ODP & PC19 zoning (source: RMM GA Pgs 5, 11)

14. The site is subject to the presence of the Building Line Restriction (BLR) capturing the Northern and Eastern extents of the site as clearly shown also on figure 2 above.

15. Critical wastewater infrastructure intersects the site, particularly the main gravity trunk line for all of Bannockburn's wastewater, but also a number of contributing sewer lines as can be clearly referenced within CODC's GIS system (refer figure 3).

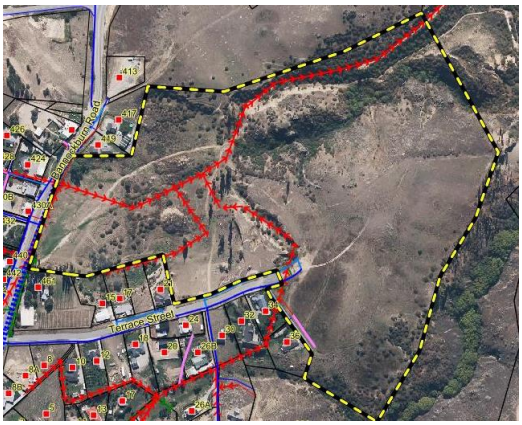

Figure 3 – Existing Wastewater Pipes on Lot 4 DP 339137 (source: CODC GIS)

16. Remnant heritage features are a defining characteristic of this site and include evidence of mining activities, unique water supply features and former buildings and community facilities around the centre of the settlement. Features previously identified on the site by Mr Matt Sole of Kopuwai Consulting of the site are shown on page 8 of Mr Milnes graphic attachment.

17. The subject land is located in the north-east of Bannockburn and is currently semi-rural in nature on account of being vacant (refer fig 1). In a general sense the site consists of two hills to the north-east and south-east divided by a prominent and steep gully system. A large open area of gentler relief is located to the southwest, also being adjacent to Bannockburn Road. Figure 4 below indicates the current depiction of the site on NZ's Topo50 map series including 20m contours. Mr Milne's evidence describes the topography in further detail.

Figure 4 – Topography of Site (Source: Topo50 map series)

18. In 2016 a comprehensive survey was undertaken of the site to quantify the contours and identify key features on the subject land with figure 5 depicting 1m contours across the subject land.

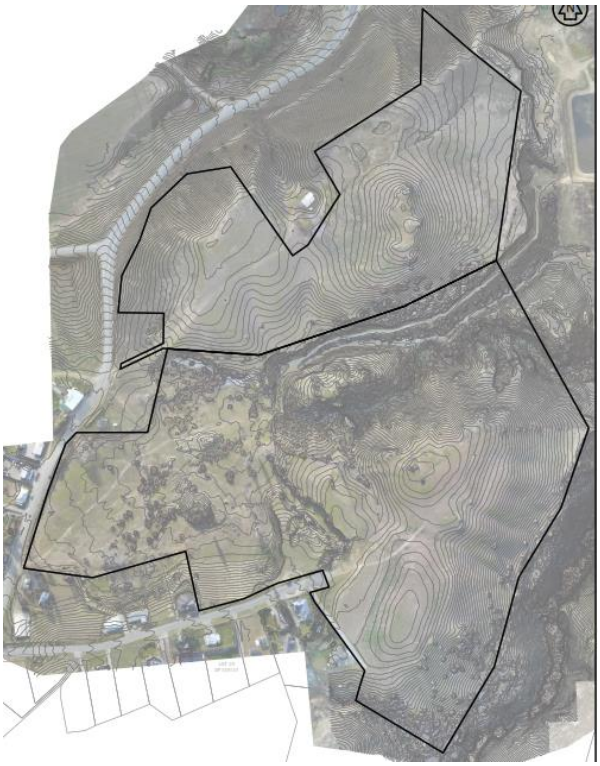

Figure 5 – Contour plan of site (Landpro: s15303_14_04_PC19_REV_B)

19. The site is clearly defined by three distinct areas. Considering the aforementioned site features, these three areas coincide with logical stages of development, as outlined below (figure 6).

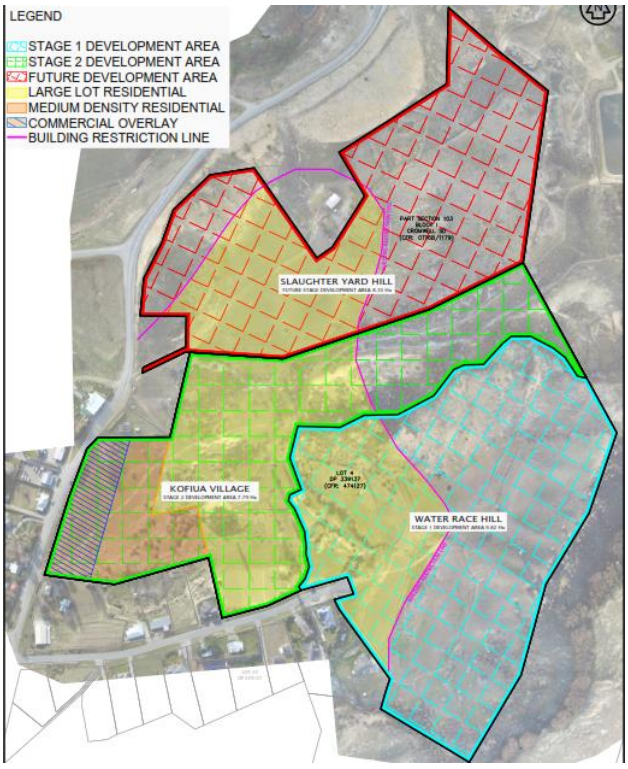

Figure 6 – Proposed Development Areas (Landpro: s15303_14_03_PC19_REV_B)

20. Stage 1 represents the final extension of Terrace Street onto "Water Race Hill" to the South-East of the property is subject to a consent application currently in progress. This area encompasses 9.82 hectares of Lot 4 DP 339137 (RT: 474127).

21. Stage 2 is that undeveloped land between Bannockburn Road, Terrace Street and Revells Gully consisting of the balance of Lot 4 DP 339137 at approximately 7.79 hectares. This is known as the "Kofiua Village" area and concerns the bulk of the relief sought (vide infra).

22. A future development area concerns the 8.33 hectare area to the North of the Trusts land known as "Slaughter Yard Hill" and is made up of the entirety of Part Section 103 Block I Cromwell SD (RT: OT 16B/1179).

EXECUTIVE SUMMARY

23. The subject land presents a significant number of constraints to the development potential of land including but not limited to: Topography, BLR, existing services, Heritage & Archaeological features, Geotechnical factors, established informal trails and community use patterns.

24. The methodology applied in the Rationale Cromwell Yield Assessment is considered sound on a district or zone level basis, but the approach does not assess realistic yield when considering development potential on an individual site basis.

25. When the same methodology is applied to the subject land specifically, a resultant yield of 80 lots is contemplated under the PC 19 zoning framework. This represents an overestimate of the development potential or realistic yield of the site.

26. An assessment of the development potential of the site has been undertaken:
    (a) Stage 1 proposed 20 lots pending re-application for consent as per ongoing correspondence with CODC regarding RC 190154,
    (b) Stage 2 returned a hypothetical 46 lots using a maximum yield approach unlikely to be adopted upon subdivision,
    (c) Future Development area contains 2.89 ha of LLRZ unburdened by BLR and is therefore unable to yield 14 lots at LLRZ.

27. Under an ODP framework realistic yield of Stage 2 drops to 20 Lots. PC 19 framework would cause further reduction due to increase in minimum lot size.

28. Ms Muir highlighted in the infrastructure report that the proposed rezoning would *exceed current infrastructure planning provisions for level of service and growth*. However, forecasted network capacity is adequate to service the realistic development potential of the proposed rezoning.

29. Upon subdivision, specific engineering design matters can be suitably addressed in line with the operative or proposed engineering standards at that time.

30. For the reasons considered above, I am of the opinion that infrastructure is not an impediment to the proposed rezoning of the subject land.

EXISTING INFRASTRUCTURE IN BANNOCKBURN

31. Ms Muir's s42A report provides sufficient detail on; the dynamic environment of provision of services, Cromwell water supply and wastewater disposal and forecasts the proposed upgrades to those services on an appropriate planning horizon. I will highlight or add some salient points with respect to Bannockburn and the subject land.

32. Both water supply and wastewater disposal in Bannockburn are serviced from their respective treatment plants in nearby Cromwell.

33. Due to its location near the entrance to Bannockburn, the subject land has a uniquely favourable location with respect to services, presently it is the last property to discharge into the wastewater network and is among the first to connect to the water supply before additional household and network connections occur.

34. Prior to 2018 Bannockburn's wastewater discharged into the Kawarau River near the Bannockburn Bridge, after moving through the now rehabilitated treatment ponds adjacent to the site.

35. Today wastewater drains to a pumpstation at the bridge and is transferred to the recently upgraded Cromwell wastewater treatment plant at Richards Beach Road.

36. The gravity trunk main in Bannockburn is 150mmØ PVC and intersects the site (refer figure 3 above). Additional gravity mains of 150mmØ PVC also enter the site and discharge into this primary gravity trunk main.

37. Elsewhere in Bannockburn wastewater drains to a low point and is pumped along Bannockburn Road to discharge back into the gravity network prior to entering the site.

38. Instances of pressurised mains vested in CODC and fed by a private pumped sewer system and boundary kits are also present elsewhere in Bannockburn.

39. Water supply is fed to the Bannockburn reservoir by a rising/falling main of 150mmØ pipe. A trunk main of 200mmØ is used to reach the Bannockburn bridge.

40. Water supply from the Cromwell treatment plant to Bannockburn is planned for upgrade between 2024 & 2026 due to existing capacity constraints.

41. Stormwater in Bannockburn is generally easily disposed of via soakpit due to favourable ground conditions, noting some exceptions due to poor soakage rates and comparatively large catchments.

42. The subject land is subject to discharge from the local piped stormwater network, collecting run off from the surrounding Domain and Bannockburn Roads and Terrace Street.

THE PROPOSAL

43. In accordance with the evidence of Mr Barr, the relief, referred to throughout the balance of my evidence as the *proposed rezoning,* has been revised on the following basis:

    (a) MRZ area of 1.8ha with a maximum building height of 8.5m, which is lower than the 11m building height permitted in the MRZ;

    (b) MRZ Commercial Precinct 30m in width along Bannockburn Road to enable a single row of mixed use and local convenience retail activity, with some bespoke rules to foster a mixed use and vibrant centre to Bannockburn;

    (c) LLRZ over the remainder of the land with a minimum allotment size of 1000m² and average of 1500m².

44. The proposed rezoning is depicted below for ease of reference in figure 7 and is shown in detail on page 12 of Mr Milnes graphic attachment.

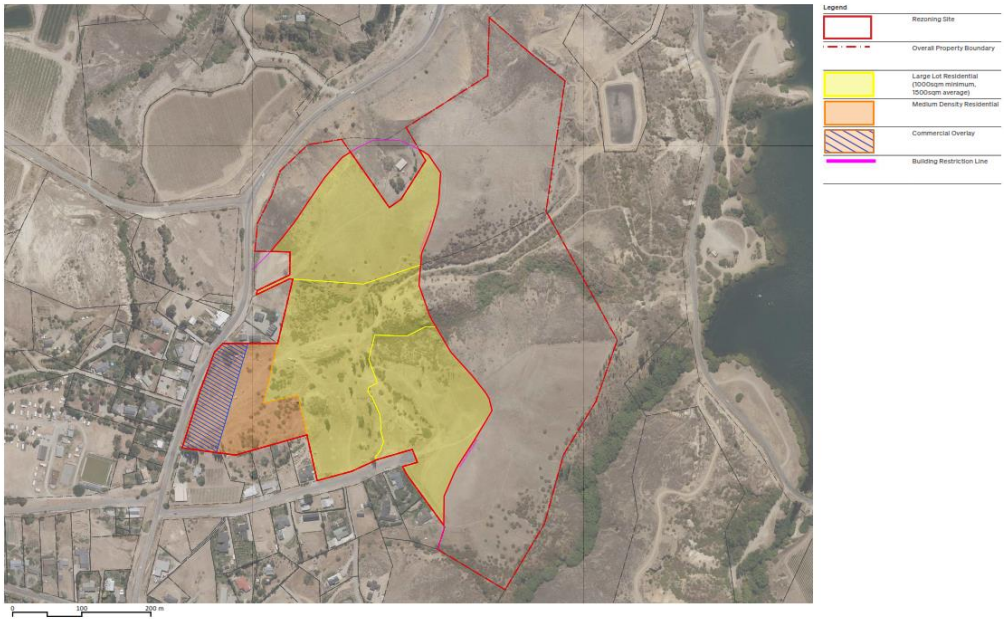

Figure 7 – The proposed rezoning (RMM GA pg 12)

INFRASTRUCTURE ASSESSMENT

45. The following infrastructure assessment focusses upon three key areas:

- Site Constraints & Engineering Considerations
- Yield Assessment
- Servicing Constraints and Solutions for Proposed Rezoning

Site Constraints & Engineering Considerations

46. The site is subject to a number of constraints with respect to it's development potential. These include physical and regulatory matters in addition to some less formal features that are currently utilised by the local community.

47. Located at the current terminus of Terrace Street and alongside Bannockburn Road, the site is in close proximity to the commercial businesses in Bannockburn. Three access points are currently provided, with one at the terminus of Terrace Street and the others from Bannockburn Road.

48. Surrounding sections range from 1,500m² to 2,700m², with some smaller sections in the vicinity as a function of historic settlement patterns near the centre of the town.

49. A fundamental constraint to the development potential of the site is the underlying topography with natural features modified by historic mining

activity in the area. As a result, areas of steep contour are present on a large proportion of the site.

50. Slaughter Yard Hill is located to the north-east of the site and is the prominent high point (279m) at the entrance to Bannockburn. South of this feature, and coinciding with the terminus of Terrace Street, is the flatter Water Race Hill with two high points (270m & 268m). Falling to the north, east and south from these hills are steep slopes, typical of landform found in the surrounding Bannockburn area.

51. Revell's Gully is another prominent feature of the site and Bannockburn generally, providing historic linkage between Bannockburn Inlet and the township. This gully divides the two hills described above and drains the site eastwards towards Bannockburn Inlet, although the gully has been influenced by historic mining drainage patterns.

52. The south-west portion of the site adjacent to Bannockburn Road is a predominantly flat area with approximately 10m of fall across the site from Bannockburn Road towards the confined entrance to Revell's Gully. Two obvious but relatively small high points in the order of five metres are present in this area as well and appear to be stockpiled material from previous excavation.

53. Steep areas exceed maximum longitudinal gradients for roads and infrastructure while presenting challenges in provision of private access in some locations. Such matters are one of the primary reasons for clear delineation of the three aforementioned proposed development stages on the subject land.

54. These steep areas also present difficulties in establishing an appropriate building site on proposed lots while maintaining the minimum lot size. For example a 3000m² area of sympathetic contour could easily accommodate multiple homes using appropriate setbacks, with the balance of the parcel on steeper land if need be, yet the geometric influence of a 2000m² minimum lot size limits the ability to provide this outcome when other factors such as access location are considered.

55. Some areas of sympathetic contour are available on the site to create a high-quality development, but these often coincide with other factors necessitating consideration from an engineering design perspective.

56. Development at increased densities should be targeted towards the least constrained area of the subject land in a topographic sense. Stage 2 (Kofiua Village), corresponds to this area of sympathetic contour and represents the area of development where the largest deviation from the proposed PC19 zoning occurs.

57. Closely linked to the topography of the site and immediate locale is another fundamental constraint being the building line restriction (BLR) established in 1987 and covering a significant portion of the site, specifically the Northern and Eastern extents of the subject land.

58. The influence of the BLR on the site means that in practice, only 45% of the land can be built upon as a controlled activity. Of the 17.6140 hectare Lot 4 DP 339137, only 8.86 hectares are unburdened by this restriction. Part Section 103 Block I Cromwell SD likewise has 2.89 hectares of its total 8.3389 hectares unburdened.

59. The area of proposed rezoning extends up to the BLR with those larger divergences from the PC19 zoning (MRZ & Commercial overlay), located adjacent to the village centre is on the opposite side of the site to the BLR burdened area.

60. Heritage features play a prominent role throughout the site and provide some insight into the previous development patterns during the gold mining era and its associated infrastructure and community features such as transit routes, stables, dwellings and orchards. Further features showcase the coal mining history of the town and others reflect the surrounding pastoral use of the land.

61. The presence of such heritage features provide clear constraints on any potential subdivision layout, particularly with respect to earthworks and site clearance not only during subdivision, but also continuing to burden future private landowners.

62. In the latter scenario, heritage or archaeological features become disjointed and at increased risk of being destroyed if left fallow across multiple parcels of

private land. During the construction of homes and gardens, these features may be highlighted on one site and either inadvertently destroyed or replaced by the extensive landscaping on another.

63. However, such features also provide a positive influence on the development layout by generating historic knowledge and interest in the local community if incorporated in any proposed layout in such a manner that harnesses those features in an accessible, continuous and legible manner.

64. Sluice work, water races and drainage gulches are prominent throughout the site and have had a significant and ongoing influence on the natural drainage patterns of the site. These have an important influence regarding the layout of roads and infrastructure, as well as property boundaries to ensure continuity of the feature where possible and provision of a suitable unencumbered buildable area on private land.

65. Existing services are located throughout the site and heavily influence any practical layout including road alignments, non-negotiable easement corridors and significantly limits the ability to manipulate levels on site with earthworks. It also affects potential building areas due to the zone of influence of structure foundations on the existing services.

66. In the vicinity of the gravity trunk main running parallel to Bannockburn Road, the carriageway level is positioned above the natural ground level of the site. In a critical location were the trunk turns eastwards, this is by as much as three metres. This provides limitations on locations of site entrances due to the increased depth of services if fill was placed.

67. A further consideration with respect to the existing services on site is that the site represents the effective terminus of private connections to services in Bannockburn. This means that in any design specification, ensuring adequate future proof provision is included in the vicinity of the transition from trunk services to local network. It also presents a cost effective means for council to upgrade existing services.

68. The presence of wastewater infrastructure throughout the site is also of a great benefit, as costly infrastructure is not required to construct anew.

69. Both subject land parcels are located within the Cromwell water and wastewater servicing area. The scheme boundary in the Bannockburn area is shown in figure 8 below with the subject land parcels highlighted. The scheme boundary is contained within the CODC Financial and Development Contributions policy dated 1 July 2021. Further, Lot 4 DP 339137 is considered to be 'connected but vacant' and Part Section 103 'able to be serviced' in modelling undertaken in 2017 for another project.

Figure 8 – Cromwell water supply & wastewater scheme boundary & the site (Source: CODC 2021 financial and development contributions policy)

70. The subject land is also burdened by services and discharge of stormwater that are not currently registered upon the title as easements in gross in favour of CODC, which also affects the development potential of the site, but allows adequate rights to be formalised upon subdivision.

71. Geotechnical factors on the site also influence the development potential of the site. There are instances of previous uncontrolled earthworks in the area of sluice faces. Underground workings are also present on parts of the subject land. These aspects will require detailed assessment upon subdivision and will have a detrimental impact on the realistic yield of the site.

72. Schist outcrops and other rock features found across the site also present obstacles to the potential development of the subject land with any potential subdivision layout being constrained and continuing influence on private landowners with house foundations requiring additional design and construction input.

73. Informal use of the subject land by community has been a long-established pattern. Primarily the land is used by the community for walking and biking with

a number of trails in place. In a more formal sense, notable community events such as the Summer Series Bike event, Bike Week, and the reenacted Battle of Bannockburn are also located on the site.

74. Trails on the site have historically been used to provide a linkage to the Bannockburn Inlet and this continues today. It should be noted however that the subject land does not provide direct access to Cairnmuir Road, as the adjacent Lot 4 DP 304454 in separate ownership is also traversed by these trails.

75. The trail with the most formal construction is located over top of the gravity trunk sewer.

76. In a general sense, application of the proposed LLRZ minimum lot size under the PC 19 framework in Bannockburn represents a reduction in the development potential of the area compared with the current rules in the ODP allowing for 1,500m² minimum and 2,000m² average lot size. Considering the subject land, this is particularly relevant given the topography and BLR affecting the site which already concentrate development onto a reduced proportion of the site.

77. Stage 2 (Kofiua Village), represents the area of development where a deviation from the proposed PC19 zoning occurs. For the reasons described above, it doubles as a logical location to increase density within the same area identified in the Cromwell Spatial Plan as suited to higher density and local convenience offerings.

78. Stage 1 and the future development area, "Water Race Hill" and "Slaughter Yard Hill" respectively, are conversely areas where a number of the constraints described above limit the development potential under the current regulatory framework. Reduction of the minimum lot size under LLRZ in these areas would allow for sensible and sympathetic placement of built form without being restricted to the 2,000m² minimum lot size required by PC 19.

Yield Assessment

79. I note that critical analysis of the entire Rationale Cromwell Yield Assessment document is outside the scope of my expertise when it relates to a ward or district scale and investigating growth predictions.

80. However, a fundamental tenet of advising clients during the land development process is assessing the development potential of an identified site based on site specific constraints and opportunities.

81. Therefore, a comparison of the broad scale desktop analysis found in the Rationale Cromwell Yield Assessment with the development potential of the site based on site specific constraints and preliminary design layouts is within my expertise.

82. The result of such a comparison indicates that for this particular site, infrastructure limitations asserted in Ms Muir's report do not represent the significant impediment discussed therein, when site specific development constraints are considered.

83. The methodology in the Rationale Cromwell Yield Assessment provides an overestimate of the yield likely to be achieved upon the subject land. The likely realisation resulting from the proposed rezoning is reduced from that contemplated in the assessment.

84. Pages 5 – 8 of the Rationale Cromwell Yield Assessment clearly detail the methodology and parameters utilised in the determining of an anticipated realisation at a settlement, ward and district level using proposed PC19 zoning as a basis. This methodology is succinctly summarised below in figure 9, which appears as figure 2 on page 6 of that same report.

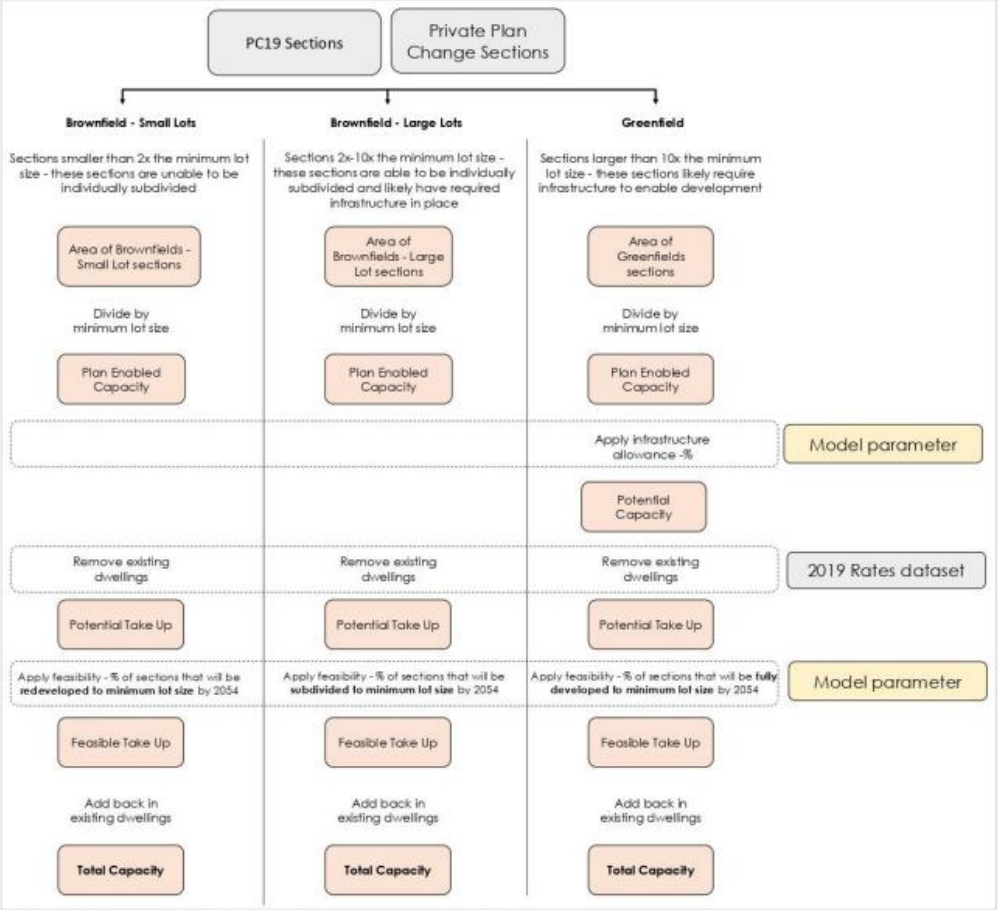

Figure 2: Overview of methodology for yield calculation

Figure 9 – Rationale Cromwell Yield Assessment Methodology (fig 2, p6)

85. The model parameters identified in table 3 and described in para 2.4 are based on a set of assumptions which while deemed appropriate for forecasting at a zone level for ward and district planning, do not adequately assess each site in finer detail.

86. Considering its purpose, the model does a good job of forecasting the yield resulting from the proposed PC19 zoning at a district scale. Individual sites, however, do not conform to a "cookie cutter approach" that allows for maximum yield (ie entire development of minimum lot sizes). This is accounted for in the model in a simple manner only, as exhibited by the 78% feasibility parameter in Large Lot Greenfield development in Bannockburn.

87. Using this methodology, in an isolated manner, the site can be characterised as follows:

- 2 x parcels both greater than 2.0000 hectares, so a *Greenfields Site*

- Located in LLRZ Bannockburn so *Infrastructure Allowance* of 20%

- Located in LLRZ Bannockburn so *Feasibility Allowance* of 78%

- Lot 4 DP 339137 currently has 7 water connections recorded in the CODC GIS system. Previous development of Terrace Street installed these.

88. Application of the above noted variables results in a *Total Capacity* of 80 lots. The calculations are shown in detail as figure 10 below. This indicates that under the PC19 framework, the anticipated number of lots which can be adequately serviced from the submitters property is a maximum of 80 allotments before upgrades to the existing network capacity are necessitated.

Methodology / Action	**Parcel 1**	**Parcel 2**	**Source**
Identify Parcel	Lot 4 DP 339137	Part Section103 Block I Cromwell SD	Record of Title
Enquire Area	17.6140 Ha	8.3389 Ha	Record of Title
Determine site type	> 2 Ha, so **Greenfield**	> 2 Ha, so **Greenfield**	> 2.0000 Ha (10 x minimum lot size of 2000m²)
Divide by minimum lot size	/ 2000m²	/ 2000m²	(Table 1 - LLRZ)
Plan Enabled Capacity	**88 Lots**	**41 Lots**	**Total = 129 Lots**
Apply Infrastructure Allowance	x 80%	x 80%	(Table 3 – 20%)
Potential Capacity	**70 Lots**	**32 Lots**	**Total = 103 Lots**
Remove Existing Dwellings	- 7 water connections	No service connection exists	(CODC GIS)
Potential Take Up	**63 Lots**	**32 Lots**	**Total = 96 Lots**
Apply Feasibility %	x 78%	x 78%	(Table 3 – 78%)
Feasible Take Up	**49 Lots**	**24 Lots**	**Total = 75 Lots**
Add Existing Dwellings	+ 7 water connections	No service connection exists	(CODC GIS)
Total Capacity	**56 Lots**	**24 Lots**	**Total = 80 Lots**

Figure 10 – Yield Methodology regarding Subject Land specifically

89. On account of being held in two records of title, the site has considered in its constituent parts rather than as a single site. This approach alongside rounding down at each stage of calculation, has resulted in the most conservative estimate possible using this methodology. An alternate approach to the calculation assuming no service connections are already in place (the 7 water connections not currently servicing any dwellings) still results in a *total capacity* of 80 lots.

90. Considering the site specific constraints affecting development potential of the subject land, the above yield of 80 lots predicted under PC 19 zoning represents an overestimation of the anticipated yield for the site.

91. In a realistic approach to the development potential of the site, the three development areas have been used to develop a number of hypothetical subdivision layouts taking heed of those constraints outlined previously.

92. Stage 1, the "Water Race Hill" area, has been subject to a previously notified resource consent application, RC 190154. This has since been revised following consultation with adjacent landowners and CODC, and a fresh application is currently being prepared as per ongoing correspondence with CODC.

93. The revised scheme plans for "Water Race Hill" propose 20 allotments and is based upon the operative district plan with minimum lot sizes of 1,500m² and an average of 2,000m².

94. Stage 2, the "Kofiua Village" area, represents the best location for any increased densities (vide supra) and an indicative scheme plan was developed to indicate the maximum number of allotments under the proposed under the proposed rezoning. A maximum yield approach was applied in order to arrive at a conservative estimate. The resultant figure is 46 allotments.

95. Considering the same "Kofiua Village" area under the ODP framework, a realistic yield of only 20 lots is available considering the site specific constraints. Increasing minimum lot size to 2,000m² in PC 19 zoning means this yield is even more difficult to achieve. Therefore, the proposed rezoning would provide 26 additional lots to that contemplated on the site by the PC 19 zoning.

96. In practice, many of lots proposed in the maximum yield approach would be conjoined, particularly in the area of MRZ. The smaller minimum lot size does however allow greater variation in lots sizes through the development. This is important to allow for careful placement of development that is sympathetic to heritage features rather than destroying them or ignoring their presence and leaving them as a fallow disjointed feature through multiple private properties.

97. The conservative nature of this estimate also provides for any additional load on the network that may be introduced by the proposed commercial overlay.

98. "Slaughter Yard Hill", the future development area, presents a number of constraints, so in the hypothetical scenarios, a remainder of 14 lots would also represent an extremely ambitious yield.

99. Considering this area specifically with respect to the PC 19 framework though, the future development area contains 2.89 hectares of land zoned as LLRZ and unburdened by the BLR. Dividing this area by the minimum lot size of 2,000m² results in 14.45, therefore a yield of 14 lots is impossible due to the requirement for an area of road.

100. Based on the above analysis I consider that there is adequate flexibility upon subdivision to ensure the maximum yield from the three development stages is 80 lots or less.

101. What this analysis shows is that the estimated yield for the proposed rezoning is less than the over-estimated yield under PC 19 zoning of the site. Therefore, due to an overestimation of the subject site's development potential, the servicing impediments highlighted in Ms Muir's report should not prevent contemplation of the proposed rezoning on the grounds of infrastructure.

Servicing Constraints and Solutions for Proposed Rezoning

102. As indicated above, on account of site specific constraints the proposed rezoning attains a lower yield to that contemplated by PC 19. Therefore, the constraints in network capacity highlighted in the s42A infrastructure report should not be considered an impediment to servicing the proposal.

103. However, setting the query of realistic yield to one side, a number of servicing constraints have been identified with respect to the site.

104. Upon subdivision, detailed engineering design and associated assessment for engineering adequacy by CODC in accordance with the operative or proposed standards of the time, a number of solutions can be explored to address those highlighted constraints to servicing.

105. Considering the subject land in her s42A Part 2 infrastructure report, Ms Muir is of the opinion that:

> *This would require significant upgrading to existing water reticulation and storage capacity. It would also require capacity increases in wastewater treatment. These upgrades exceed current infrastructure planning provisions for level of service and growth*.

106. Existing constraints in network capacity, which have been included in infrastructure upgrade plans to allow for PC 19 zoning and the Cromwell

Masterplan, forms the basis of these comments. A prudent approach such as this is important when considering council's financial and servicing obligations in a dynamic environment.

Potable water supply

107. Within that same report, relevant constraints in the supply of water include:

(a) Consented water take

(i) Current consent expires 2028 for abstraction of 18,000m³

(ii) Sufficient capacity for 10 years [which is assumed to account for PC 19 zoning]

(iii) Predicted growth means insufficient capacity at 30 year demand of 20,000m³

(b) Protozoa Treatment required to ensure compliance with NZDWS

(i) Work planned for 2024 & Completion in 2025.

(ii) Capacity of the new compliant treatment plant will meet requirements of PC 19 zoning and Cromwell Masterplan.

(c) Revised hydraulic base model due for completion in June 2023

(i) Historical greenfields site added as consented.

(ii) Current model is sub-optimal as it is noted that additional constraints will be identified.

(iii) Funding in place for 2027 replacement of high priority reticulation and pumpstation capacity constraints required to meet requirements of PC 19 zoning and Cromwell Masterplan.

(d) Bannockburn Trunk Main Capacity constrained

(i) Planned for replacement between 2024 & 2026

(e) Individual pipeline constraints towards end of Hall Road

(f) Storage Volume at Bannockburn Reservoir

(g) Pressure fluctuations in Bannockburn likely with additions to network

108. Admittedly, most of these constraints are related to district level obligations, such as consented water takes, treatment capacity and maintaining an accurate hydraulic model.

109. However, each of those matters have some form of planning underway for replacement or upgrade.

110. Remaining items, such as the Bannockburn storage reservoir volume that could be supplemented in the short term with addition of tank farm at the reservoir, could be scaled and conditioned with specific resource consent conditions.

111. Pressure fluctuations are considered likely using the hydraulic model as a basis, this creates some uncertainty on each new project as they influence of such is only added to the model afterward. The new model due next month will address this and should provide clarity as to the scale and location of this issue in Bannockburn. Appropriate engineering solutions can then be developed and implemented upon subdivision, a Council initiated upgrade, or combination thereof.

112. Further, the site allows some opportunity to future proof a portion of Bannockburn by improving the reticulation network location and applying appropriate pipe sizing. If specific pressure fluctuations affect the subject land, then engineering solutions could be investigated and implemented upon subdivision which may include pressure tanks or similar.

113. In my experience on other projects in Bannockburn, pressure and volume for firefighting purposes is the most problematic issue introduced by the existing water supply network constraints.

114. Fortunately, Fire and Emergency New Zealand are able to approve alternate means of fire fighting in specific circumstances, details of which can be captured by a consent notice upon subdivision. When considering the proposed rezoning, an obvious solution is specifying that all buildings located in the MRZ require sprinkler or fire suppression systems if inhabited prior to network upgrades. Such as system would also assist in encouraging sustainable use of resources into the future.

<u>Wastewater disposal</u>

115. Within that same report, relevant constraints in the disposal of wastewater include:

(a) Consented wastewater discharge

(i) Expires 2049

(ii) Consented nitrogen limits being forecast to be exceeded by earlier than 2031

(iii) Treatment upgrades for Nitrogen limits required before 2026

(b) Wastewater treatment

(i) 2017 upgrade completed.

(ii) 2028 process improvements were planned.

(iii) Increased forecast in growth

(iv) Funding available to increase nitrogen removal and membrane treatment capacity between 2025 and 2028.

(c) Revised hydraulic base model due for completion in 2024

(i) Historical greenfields site added as consented.

(ii) Sub-optimal model currently with respect to PC 19 zoning and Cromwell Masterplan.

(iii) Funding in place for replacement of high priority reticulation and pumpstation capacity constraints – Assumed from 2024 onwards due to no specific detail.

116. Similarly to the water supply constraints, most wastewater network constraints relate to district level obligations such as consented water takes, treatment capacity and maintaining an accurate hydraulic model.

117. Planning is underway for replacement or upgrade of network infrastructure with funding secured for high priority matters. It should be noted here that regardless of the yield achieved on the subject land, these constraints and obligations will still exist.

118. Elsewhere in Ms White's s42A Part 2 report, it is noted that while Bannockburn will not meet forecasted demand for housing supply, this demand can be adequately taken up elsewhere in the Cromwell Ward.

119. Due to the entire Cromwell Ward being serviced by the single wastewater treatment plant, which was recently upgraded and scheduled for more upgrades in 2028, this indicates that at a ward level sufficient short-term capacity is planned for and available at the treatment plant to allow for the proposed rezoning.

120. Taking a long-term perspective, the proposed rezoning will contribute to a more accurate reflection of the future housing supply in Bannockburn for infrastructure planning provisions regarding upgrade and improvement of the treatment plant. Due to currently forecasted growth, and likely regulatory improvements, extensions to such treatment are necessary regardless of the proposed rezoning.

121. In a general sense increased growth on an existing wastewater network is beset by two fundamental issues; capacity for peak flows which are dependent upon the pipe size, and in/egress of volume into network which depends primarily on the physical condition of the infrastructure.

122. The obvious solution to both matters is to replace existing infrastructure with new suitably sized pipes. Bannockburn has the same sized gravity pipeline throughout the town being a dN 150mmØ PVC pipe which flows through the subject land.

123. The subject land is currently and likely to always be the last or furtherest downstream property connected to the gravity wastewater network. This indicates that by allowing higher densities of development in accordance with the proposed rezoning presents the opportunity to replace the section of dN 150mmØ PVC pipe with the greatest load.

124. Upon subdivision in accordance with the proposed rezoning, the opportunity to future proof the network is availed through cost sharing arrangements for such upgrades being implemented and appropriate easements being secured.

125. In lieu of resizing existing infrastructure as highlighted above, the proposed rezoning can also contribute to increased network efficiency by reducing the peak flows into the network. This can be achieved thorough specification of private pumped sewer systems which will attenuate peak flows into network and provide emergency storage prior to reaching the CODC network.

Alternately additional storage provision at the Bannockburn bridge pump station could be conditioned upon subdivision.

126. It was previously highlighted that the depth and layout of the existing wastewater network provide a constraint upon the development potential of the subject land. Where earthworks, fill in particular, are necessary in the vicinity of existing pipes and will result in unacceptable depth of cover, replacement of those sections of pipe within appropriate service chambers could be explored or alternately a realignment of existing services investigated.

Stormwater and access

127. While not included in the s42A infrastructure report, two further considerations are stormwater and access.

128. As previously raised, stormwater discharge in Bannockburn is typically via soakpit, but the site is subject to outfall of stormwater captured from the surrounding roading network.

129. Stormwater management can often become ineffective when left to a series of disjointed measures located on private property. A better solution is to comprehensively address stormwater on a catchment basis and due to the downstream position of the site with respect to local stormwater discharge, the opportunity to future proof stormwater management in the wider Bannockburn area is availed by the proposed rezoning.

130. The subject land currently represents a major secondary flow path discharging to Bannockburn inlet via Revell's Gully, so the site provides an important role in providing attenuation during significant storm events. The site also presents an opportunity to implement quality improvement measures that are currently non-existent in discharge from Bannockburn's stormwater infrastructure.

131. Such attenuation and quality improvement measures could be easily incorporated into recreational features such as pedestrian and cycle linkages.

132. Vehicular access to the site and between the proposed development areas is limited due to the site specific constraints outlined above. This will encourage a slow speed environment by virtue of geometry and surrounding land use. This

also allows for carparking for visitors to the town centre. A continuous network of pedestrian and cycle linkages is also proposed

133. Typically roads are considered exclusively as an area for vehicular transit. However, the proposed rezoning contributes to a well-connected community with any new road corridor within the proposed rezoning accepted as a shared space due to higher density of activity in the vicinity, in line with updated guidelines for land development in NZ (NZS4404:2010).

134. Provision of such pedestrian and cycle linkages are a key component to this site and allow connection between the Bannockburn Inlet, Kawarau River, surrounding vineyards and the successful Lake Dunstan cycle trail and the existing pedestrian network in Bannockburn.

135. Future growth of Bannockburn and the surrounding area could require review of the rural road standard applied to Bannockburn Road, particularly considering the town centre area. The proposed rezoning would inform this with the MRZ and the commercial overlay providing some early guidance on the land use adjacent to the road formation. Entrances to the road network from the subject site could then be appropriately dealt with upon subdivision.

Further comments

136. It is also vital to be aware of timeframes associated with development. A typical simple subdivision development can take in the order of 12 months to complete from resource consent application to raising of titles, with additional time required if significant civil construction is required, as would be the case for the subject land.

137. Subsequent delay in the planning, construction and habitation of houses in the current climate is widely reported and will also typically take at least 8 months in a best case scenario for a "spec house".

138. Therefore, the timeframes indicated in the s42A infrastructure report (specifically the Bannockburn Trunk Main upgrade between 2024 & 2026) will provide adequate network capacity in advance of any substantial increased load associated with the proposed rezoning being realised.

139. In my opinion this site physically embodies the "lowest hanging fruit" for development in Bannockburn from an infrastructure perspective due to its location and unique site constraints. As a simple function of proximity, it presents the lowest cost opportunity to upgrade and future proof existing services while providing additional housing supply around the community hub.

140. The MRZ and commercial overlay also present the opportunity for application of more stringent engineering conditions upon subdivision resulting in reduced load on the existing network and encouraging better management of resources into the future. Examples referenced above include; buildings must have sprinkler systems installed and specification of private pumped sewer systems.

141. Considering the matters raised above with a view towards the higher densities in the proposed rezoning, sufficient scope is available to solve a number of perceived shortcomings in infrastructure on this site and could adequately be addressed upon assessment for engineering adequacy upon subdivision. Those further critical constraints regarding district level obligations will also likely be completed in advance of realisation of the proposed rezoning based on currently planned and funded infrastructure upgrades.

CONCLUSION

142. Due in part to the range of constraints to development on the subject land, this site represents a strategic location for higher density development via the proposed rezoning.

143. In particular, under the proposed rezoning, the "Kofiua Village" proposed development area (Stage 2) represents an area of development where deviation from the PC19 zoning is targeted. For the reasons discussed above, this is a suitable area of Bannockburn to increase density and aligns with the communities views identified in the Cromwell Spatial Plan that the area alongside Bannockburn Road is suited to higher density and local convenience offerings.

144. The yield assessment model utilised by Rationale, while appropriate for a district scale analysis, has provided an overestimate of the development potential of the subject land by not considering site specific factors.

145. Available network capacity is therefore considered sufficient to service the likely realisation of allotments from the subject land if the proposed rezoning is granted.

146. Upon subdivision, specific engineering design matters can be suitably addressed in line with the operative or proposed engineering standards at that time. This will encourage sustainable resource use, assist with overcoming existing network constraints and increase the resilience of the network by either cost sharing or bringing forward replacement and re-sizing of critical infrastructure.

147. For the reasons considered above, I am of the opinion that infrastructure is not an impediment to the proposed rezoning of the subject land.

148. Thank you for the opportunity to present my evidence.

Richard Ford
16 May 2023

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