Application for a resource consent - Form 9

APP231235466

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Date and Time Created	22/12/2023 01:49

To cross reference Datacom with MAGIQ please click Here. to add the Resource Consent number.

Property Details

Property Address	88 Terrace Street Bannockburn
Record of Tile Number	474127
Legal Description	Lot 4 DP 339137

What is your role in this application?	Agent acting on behalf of the applicant

Agent details

An agent acts on behalf of the applicant in the submission and processing of the application.

Organisation	Town Planning Group
First name	Craig
Last name	Barr
Phone number	0274065593
Email address	craig@waveformplanning.co.nz

Note that the applicant will also receive a copy of all correspondence.

Postal address:	3 Frederick Street, Wanaka 9305
Confirm that you have approval to act on behalf of the applicant	Yes

The applicant is the person(s) or organisation making the application.

Applicant details

Is this applicant an individual or an organisation?	Business / organisation
Organisation	D. J. JONES AND N. R. SEARELL FAMILY TRUSTS

Contact Person

First name	Chris
Last name	Fowler
Phone number	021 311 784
Email address	Chris.Fowler@saunders.co.nz
Postal address:	PO Box 18, Christchurch 8140

Authority to apply on behalf

Confirm that the applicant is authorised to apply on behalf of the organisation	Yes

Invoicing

Who is paying the invoice?	Applicant

DETAILS

Activity or works proposed

Application type	Subdivision consent
Short description of your proposal	Subdivision and land use resource for a residential subdivision development at 88 Terrace Street Bannockburn. The subdivision comprises 20 lots for residential development including the construction of an internal access road and rights of way, recreation reserve and balance lots.

Provide a detailed description in the Assessment of Environmental Effects (AEE) or other document.

Assessment of Environmental Effects (AEE)

An application cannot be accepted for processing by the Council under Section 88 of the Resource Management Act 1991, without an Assessment of Environmental Effects (AEE).

Refer to the guidelines for Assessment of Environmental Effects.

88 Terrace St Subdivision Planning Assessment and AEE.pdf (2 mb)

Assessment of the activity

You may need to provide an assessment of the activity against the following provisions:

- **The matters set out in Schedule 4 of the Resource Management Act 1991.**
- **Any relevant objectives, policies, or rules in a document.**
- **Any relevant requirements, conditions, or permissions in any rules in a document.**
- **Any other relevant requirements in a document (e.g. in a national environmental standard or other regulation).**

Please do not load the same document that you loaded for AEE above

Other activities

Other applications

Are you required to apply for any other resource consents for this project?	Yes
Provide a brief summary of the other consents required	Earthworks resource consent under the Otago Regional Plan, Water for Otago. Archaeological Authority. Refer to AEE
Is this project related to a building consent?	No

Pre-application information

Have you discussed this proposal with Council staff prior to this application?	Yes, a pre-application meeting
Name(s) of Council staff involved	Ann Rogers
Date of discussion	19/12/2022

Site visit requirements

Who is the site contact?	Other

Site contact name	Chris Fowler
Phone number	021311784
Email address	Chris.Fowler@saunders.co.nz

Affected party approvals

All affected property owners, including trustees where properties are held in a trust, must sign written approval forms AND a copy of your plans.

- **If an affected party does not give approval to your proposal this may impact on the way that the application is processed.**
- **Council's duty planner can provide you with advice on which parties may be affected by your proposal.**

Download an affected party approval template form.

Do you need affected party approval?	No
Reason	Refer to AEE

National Environmental Standard – Contaminated Soil - option selected	I have included a Site Investigation undertaken by a suitably qualified person.

LIST OF FILES

Att. [D] PSI DSI.pdf (6 mb)
88 Terrace St Subdivision Planning Assessment and AEE.pdf (2 mb)
Att. [A] Plans.pdf (11 mb)
Att. [B] Landscape Masterplan Mitigation.pdf (3 mb)
Att. [B] RMM Graphic Attachment.pdf (14 mb)
Att. [B] RMM Landscape Assessment.pdf (2 mb)
Att. [C] Heritage Assessment Appendices.pdf (15 mb)
Att. [C] Heritage Assessment.pdf (3 mb)
Att. [D] Geotechnical.pdf (15 mb)
Att. [E] Transport Assessment.pdf (208 kb)
Att. [F] Preliminary ESC.pdf (4 mb)
Att. [H] Rule Framework.pdf (225 kb)
Att. [G] Record of Title.pdf (358 kb)

TOWNPLANNING GROUP

Application for Resource Consent to the Central Otago District Council:

D. J. JONES AND N. R. SEARELL FAMILY TRUSTS

Subdivision and land use resource consent

88 Terrace Street

Bannockburn

22 December 2023

Document prepared by:

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Supporting Information

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[B] Landscape Assessment
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[D] Contaminated land and geotechnical assessments
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[F] Preliminary Erosion and Sediment control Plan
[G] Record of Title and Interests
[H] Summary of relevant rules

1 Introduction

The D. J. Jones Family Trust and N.R Searell Family Trust (**Applicant**) applies for subdivision and land use resource for a residential subdivision development at 88 Terrace Street Bannockburn.

The subdivision comprises 20 lots for residential development including the construction of an internal access road and rights of way, recreation reserve and balance lots. Subdivision Plans are in **Attachment [A]**.

The site is located at the terminus of Terrace Street Bannockburn within the Central Otago District, and is zoned Residential Resource Area (4) (**RRA(4)**) in the Operative Central Otago District Plan. The site is affected by a building line restriction overlay (**BLR**) identified on the District Plan Maps, as identified in **Figure 1** below.

The purpose of the RRA(4) Zone, in general terms is to provide for residential activity, and at Bannockburn, at a density of 1500m² minimum lot size while achieving an average lot size of 2000m². The site is zoned Large Lot Residential through the Council's Plan Change 19.

A restricted discretionary activity resource consent is required under the Central Otago District Operative District Plan (**ODP**) for subdivision, and locating buildings within a building restriction line.

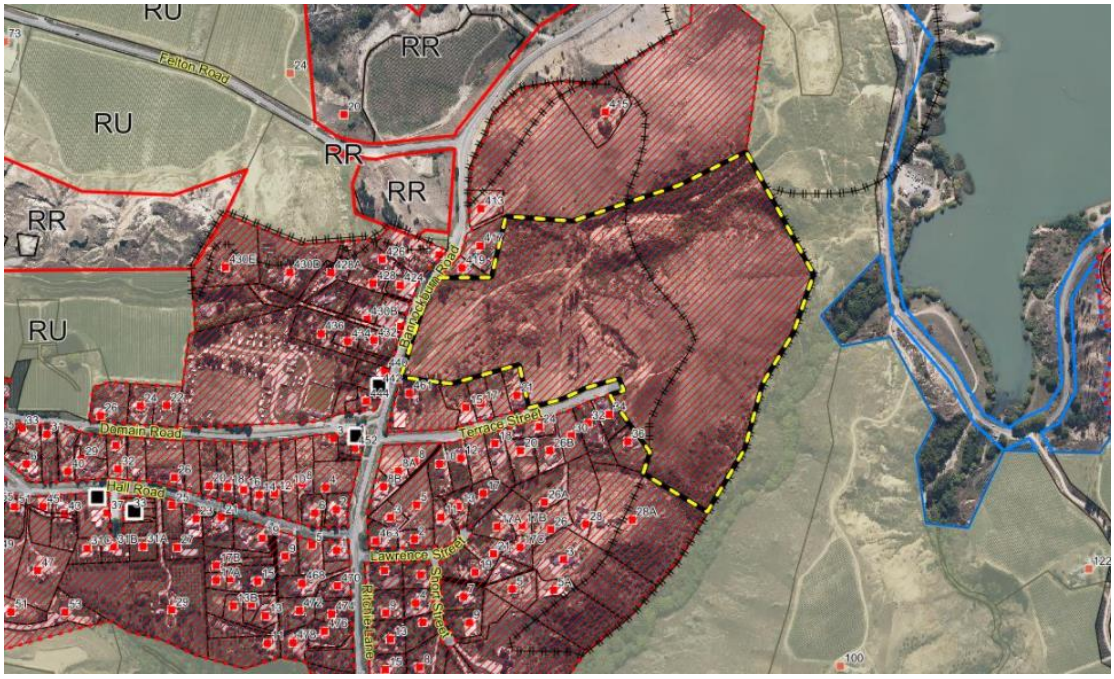


Figure 1. Application site (yellow and black outline) illustrating the District Plan Residential zoning (red hatching) affecting Bannockburn township and the BLR is annotated by the black hatched line (CODC Web Maps).

Thirteen of the proposed lots are located either wholly within or partially within the BLR, additionally, the site has known heritage values and archaeological sites present as a result of former gold mining and early European settler farming activity. The application is supported by a landscape and visual effects assessment prepared by Rough, Milne Mitchell (**Attachment [B]**), a heritage assessment by Kopuwai consulting (**Attachment [C]**), a contaminated soil assessment and a geotechnical assessment by Engeo (**Attachment [D]**).

The application also contains other technical advice for the subdivision including a traffic report from Bartlett Consulting (**Attachment [E]**) and a preliminary erosion and sediment control plan (**ESCP**) in **Attachment [F]**.

This Assessment of Environmental Effects (**AEE**) report, supported by the above technical advice, considers the effects of the proposal and determines that the proposal will minor adverse effects on the environment. Public notification is not requested, and nor are any persons considered to be adversely by the proposed activity.

This proposal is consistent with the objectives and policies of the ODP and the National Policy Statement Urban Development (**NPS-UD**), the proposal is consistent with the purpose and principles of the Resource Management Act 1991 (**RMA**) and accords with the definition of sustainable management under Part 2.

2 Site and Surrounding Environment

2.1.1 Site and Wider Environment

The site is legally described as Lot 4 DP 339137 and is held within Record of Title **(RT**) 474127, which is in **Attachment [G]**. The New Zealand Transverse Mercator map reference of the centre of the site is E 1298395 and N 5000237.

The physical setting and description of the site from a landscape perspective is set out in detail by RMM in the landscape assessment in **Attachment [B]**.

The site is accessed from the eastern extent of Terrace Street and is characterised as a large undeveloped residential zoned allotment located at the edge of the existing Bannockburn township.

There are Council reticulated water and wastewater services adjoining the site.

The site is situated on a remnant alluvial terrace, north of and at the base of the Carrick Range, and west of the Bannockburn Inlet. The remnant alluvial terrace the site is located on is elevated above the Bannockburn Inlet by approximately 60m.

The ground surface within the subdivision area comprises a gently undulating terrace between 270m and 275m above sea level (**asl**), before dropping steeply to the north towards Revell's Gully, east towards Bannockburn inlet and south towards Shepherds Creek.

Vegetation cover on site is characterised by hieracium, wild thyme, briar and naturalised pasture grasses. There may be some scattered areas of dryland indigenous vegetation on the escarpment faces.

The Otago Regional Council's Webmap viewer identifies water features/drainage systems on the site and adjacent site which flow into the Bannockburn Inlet of Lake Dunstan, illustrated in **Figure 2** below. The northern water feature is Revell's Gully and the southern water feature is Shepherds Gully. These water features will not be directly affected by the proposed earthworks because they are both outside of the development area, and where Revell's Gully is located on the Site, it is within the application site is contained within the balance lot (proposed Lot 40).

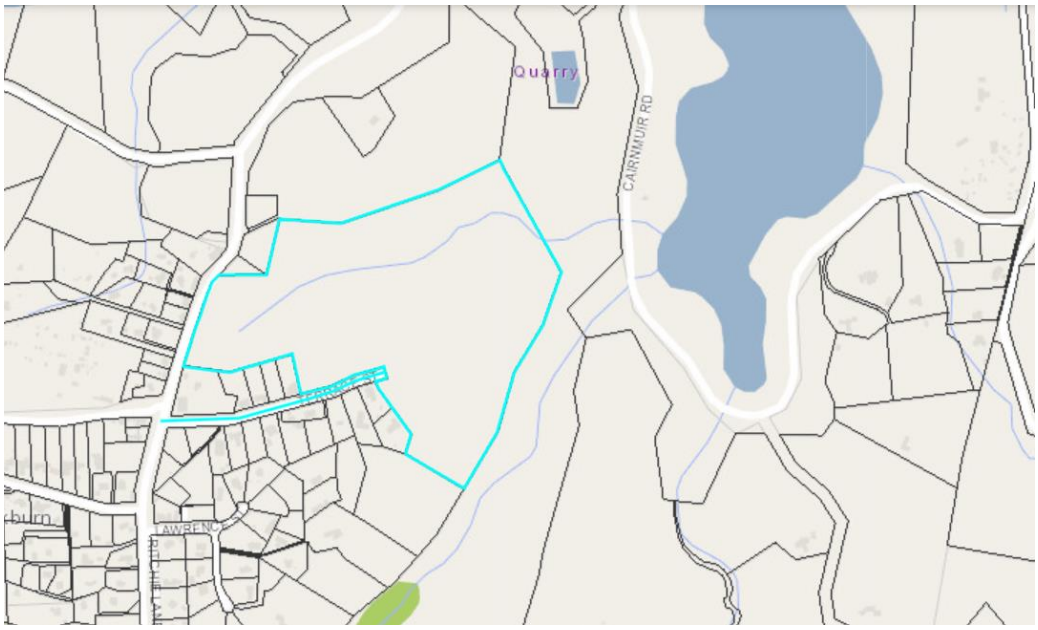


Figure 2. Excerpt of the ORC's webmap viewer identifying water bodies/catchment drainage over the site (blue outline).

With the exception of the above, the site does not contain any known permanent or ephemeral waterbodies, however, contains several gully features and depression areas which are likely to operate as overland flow paths and convey stormwater during rainfall events to Revell's Gully and Shepherds Creek, which in turn flow into the Bannockburn Inlet. There are not any identified springs or seepages on site, and the groundwater table is expected to be a significant depth below the site.

The site shows evidence of former gold mining works dating back to pre-1900's. There is a network of historic water races and deeply incised sluice gullies with sluice faces and channel which are described in greater detail below and in the Heritage and Recreational Assessment by Kopuwai Consulting in **Attachment [C]**.

These features and more likely than not other previously earthworked areas on site, are archaeological sites and an authority will be required under the New Zealand Pouhere Taonga Act 2014 for modifying archaeological sites prior to any disturbance of these areas. This resource consent application can be advanced ahead of obtaining these authorities.

The soils within the subdivision area comprise a layer of topsoil between 0.2m to 0.3m thick overlaying 0.3m to 0.8m of weathered alluvium, comprising medium dense to dense fine sand with some silt and minor gravels.

A deep gully bisects the centre of site and descends through a steep escarpment to Bannockburn Inlet, providing an access point for informal walking access between Bannockburn and the Inlet. Terrain south of the gully consists of a large relatively flat and low lying, area punctuated with numerous hillocks, holes and surrounded by steep cliffs and terraces, while north of the gully, landform rises steeply to Slaughter yard Hill at 270masl.

In addition to the RRA(4) zoning, the District Plan maps identify a BLR over the site which affects the entire east to north facing slopes of the escarpment and lower parts of the hillside down toward the Bannockburn Inlet, as illustrated in **Figure 3** below.

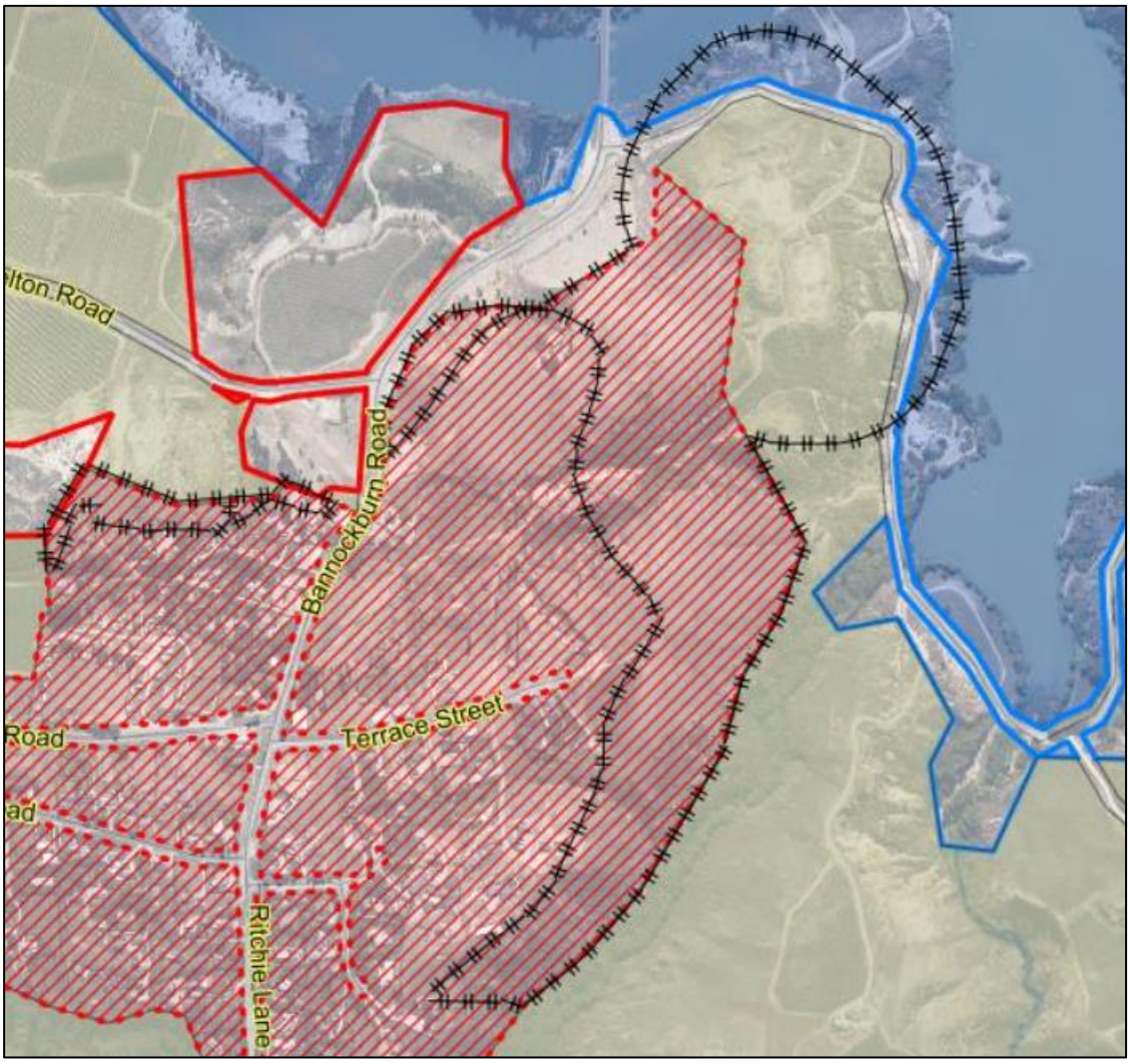


Figure 3. Excerpt of the District Plan web map viewer illustrating the BLR (back line with cross hatching), RRA(13) zoning (red hatching) and surrounding Rural Resource Area zoning (yellow shading)

2.1.2 Roading and Transport Environment

Bannockburn Road is an urban local road within the ODP road classification[1]. Bannockburn Road has a current (estimated) traffic flow of 1,500vpd[2] serving the urban area of Bannockburn and the rural land to the south of Bannockburn. At the site, and at the intersection with Terrace Street, Bannockburn Road is formed with two traffic lanes on a 7.0m sealed carriageway width. Bannockburn Road has a speed limit of 50km/hr posted as you enter Bannockburn, the general straight alignment of Bannockburn Road suggests a likely operating speed of less than 60km/hr.

[1] Refer CODC District Plan, Schedule 19.7: Roading Classification.
[2] From Mobile Road (mobileroad.org) estimated traffic flow of 1,500vpd with 8% heavy vehicles dated 18/05/2020.

The site is accessed from the existing cul-de-sac end of Terrace Street which is also an urban local road within the ODP road classification[3]. Terrace Street has a current (estimated) traffic flow of 97vpd[4] serving the residential properties on each side. Given the number of residential properties served it is likely that the current (2023) traffic flow on Terrace Street will be closer to 200vpd. Terrace Street is formed with two traffic lanes on a 7.0m sealed carriageway width. The speed limit of Terrace Street is 50km/hr, based on the roadside residential activity it is likely that the operating speed will be approximately 50km/hr to match the speed limit.

There are no public transport services that serve Bannockburn although there are school bus services between Bannockburn and the Schools, primary and secondary, which are located in Cromwell.

Within Bannockburn there are no formal cycle trails and cyclists are expected to share the road with vehicles within the 50km/hr speed limit.

A recent pedestrian and cycle path has been constructed adjacent to Bannockburn Road providing a pedestrian and cycle connection between Felton Road and Cromwell, it is expected that this trail will be extended into Bannockburn in the near future. This trail also links with the Cromwell to Clyde leisure trail which is part of the Clutha River Trails.

Footpaths are provided on Bannockburn Road and other streets within Bannockburn, these are provided on one side only. These is no footpath provided on Terrace Street, on this road pedestrians (and cyclists) are expected to share the road with vehicles.

There are informal pedestrian and cycle trails running through the site, this includes a link through the northern portion of the site between Bannockburn Road and the Bannockburn Inlet (Lake Dunstan and Cairnmuir Road). This trail has no legal corridor and is reliant on access over land owned by others outside of the site.

[3] Refer CODC District Plan, Schedule 19.7: Roading Classification.
[4] From Mobile Road (mobileroad.org) estimated traffic flow of 97vpd with 2% heavy vehicles dated 10/10/2016.

3 Description of the Proposal

3.1 Overview

Subdivision and land use resource consent is sought to establish 20 lots for residential activity, roads, a recreation reserve and small balance lots.

The subdivision will involve earthworks to create the internal access road and vehicle accesses into each lot, and associated subdivision development works to form the frontage to the lots, trenching and installation of reticulated water, wastewater and telecommunications infrastructure. No earthworks are proposed to facilitate the building sites within each proposed residential lot.

Attachment [A] contains the subdivision plans illustrating the location of the proposed lots, roads and reserves.

The earthworks associated with the subdivision will be in the order of 10,400m² in area.

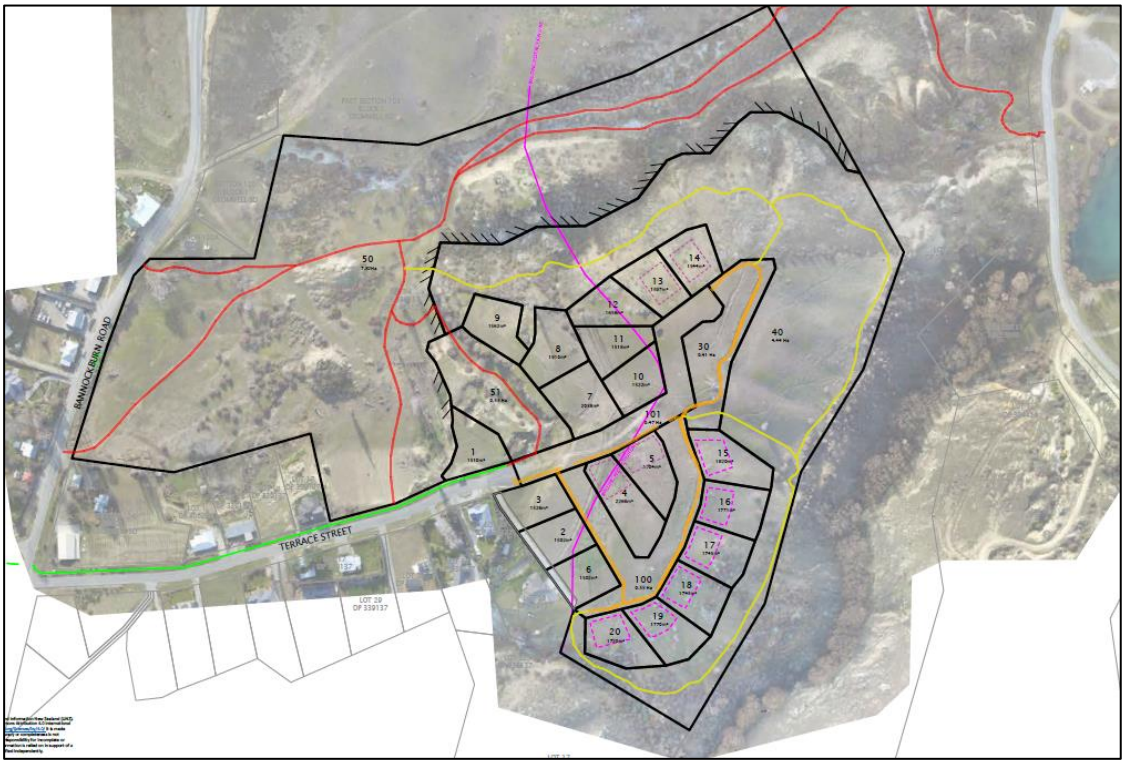


Figure 4. Subdivision plan.

In Figure 4, the coloured lines represent the follows features:

- Purple Line - ODP Building Line Restriction Annotation
- Yellow Line – Proposed single track on the balance lots (to be registered as easement in gross)

- Green line – Proposed footpath on existing Terrace Street
- Orange Line – Proposed Grade 1 or 2 Trail incorporated into the water races
- Red lines – existing informal tracks

3.2 Subdivision Design

The subdivision has been designed as an extension of Terrace Street which currently terminates at the western boundary of the Site. The residential lots will be dispersed either side of the road, with the road terminating at a proposed recreation reserve and small car park area.

A short loop road (Lot 100) is located on the southern side of the central road (Lot 100) which will provide access to Lots 2, 6 and 15 to 20. The Bartlett Transport assessment in **Attachment [E]** identifies that lots 2, 3, and 6 can obtain access to Terrace Street via the existing right of way located along the western boundary of those lots, which adjoin 34 and 36 Terrace Street. However, the application does not seek to utilise these rights of way and access to Lots 2, 3 and 6 will be via the new roads.

Formal public access will be provided for on the roads and within the proposed recreation reserve. Informal public access is enabled throughout the balance lots (Lots 40 and 51).

The subdivision comprises the following allotments with their intended functions set:

3.2.1 Lots 1-20: Residential Lots

Lots 1-20 will be freehold lots for residential activity. The lots range in size from 1502m² to 2265m². All lots will have direct access to a road (Lots 100 and 101).

Lots 2, 3 and 6 are located at the southwest boundary of the Site and adjoin existing residential properties at 34 Terrace Street and 36 Terrace Street. Although there is an existing access and right of way easement formed upon the western boundary of the site which provides access to 36 Terrace Street, proposed Lots 2 and 6 (and Lot 3 if desired) will obtain access via the eastern boundary of these lots to a new road. This is to limit the amount of traffic using the existing access and to provide separation from those existing properties and the future dwellings on Lots 2,3 and 6 (while noted that buildings could be build as a permitted activity on Lots 2 and 3).

3.2.2 Lot 30: Recreation Reserve

A 4100m² recreation/local purpose reserve is proposed to be located at the terminus of the Terrace Street road extension. The reserve will provide amenity, connection to the informal public trail and a lookout area to the north and east towards Cromwell, the wider Upper Clutha area and eastwards towards the Bannockburn Outlet and Surrounds. The reserve will also contain interpretive material associated with the former mining activity, heritage associations with the twin Water Race Hill water races

(archaeological Site identifier F41/369), and also potentially geomorphic explanations of the Upper Clutha area.

3.2.3 Lot 40: Balance Lot

Lot 40 is a large balance lot 4.44ha in area which for the most part comprises moderate to steep east to north facing slopes. Lot 40 was initially intended to be vested as a reserve to formalise the existing walking access. Consultation with Council officers in 2022 and early 2023 has revealed that the Council do not want the area to be vested as reserve. Reasons for this are the shortage of flat land for development of formal recreation facilities.

While this is acknowledged, Lot 40 is considered to provide useful walking, amenity and areas for indigenous biodiversity regeneration (both passive regeneration or via restoration).

Because the advice from the Council is that Lot 40 is not suitable for a local purpose reserve, the lot will be retained as a freehold lot by the Applicants. The existing informal walkways within this area will maintained, however no formal recognition of the walking areas is proposed.

3.2.4 Lot 50: Balance Lot

Lot 50 is a 7.82ha balance lot that is intended for future development. Lot 50 has frontage to Bannockburn Road. Lot 50 has frontage to Bannockburn Road and comprise of Revell's Basin sluicing's a recorded archaeological site.

3.2.5 Lot 51: Balance Lot

Lot 51 is a 0.53ha balance lot which comprises a gully feature and contains a recorded archaeological gold workings gully feature F41/368 Pennyweights Sluicing's.

3.3 Landscape and Visual Amenity

As identified above the Site is zoned RRA(4) and residential activity at a density of 1500m² minimum and average of 2000m² is anticipated on the site. Buildings for residential activity are a permitted activity subject to the following building development bulk and location rules of the ODP:

- 7.5 building height limit and 7m building height limit on sites with a slope of 6° or greater[5].
- Compliance with height limits in relation to boundaries[6].
- Building coverage of 40%.

[5] Rule 7.3.6 (iii) (f).
[6] Rule 7.3.6 (iii) (f).

- Earthworks only limit to extraction not exceeding 1m depth within 2m of any site boundary[7].

In the proposed subdivision, Lots 4, 5, 6, 13, 14, 15 to 20 are located either entirely within, or such that future buildings will be located within a building line restriction area identified on the ODP Plan Maps. Lots 2, 10, 11 and 12 are also affected by the BLR, but it is more likely than not that houses will be able to be built outside, or partially outside the BLR.

RMM have prepared a report assessing the effects on visual amenity values, character and the natural character values of the Bannockburn inlet of locating buildings within the BLR area. The following mitigation measures are recommended by RMM and these form part of the volunteered conditions of consent and design aspects of the subdivision:

- On Lots 4,5,13,14, 15 – 20, a building platform of 500 m² shall be identified with all buildings and associated curtilage restricted to locate within the building platform areas. No built development shall be permitted outside the building platform, such as clothes lines, swimming pools or other activities generally associated with a curtilage area.
- For all of Lots 1-20, a maximum built coverage of 300m². Should any dwellings be two storeys, the maximum footprint for the ground floor will be 200m².
- The access to Lot 6 shall be designed to limit the extent of earthworks required, and as far as practicable off the ridgeline.
- Exterior cladding shall be limited to timber (vertical or horizontal), schist, or corrugated iron in one of the following Colorsteel colours: Lichen, Sandstone Grey, Lignite, Ironsand, FlaxPod, Grey Friars, New Denim Blue.
- Roofing shall be constructed of corrugated iron in one of the of the following Colorsteel colours (or similar with a light reflectance value (LRV) of the less than 12%): Lignite, Ironsand, FlaxPod, Grey Friars, New Denim Blue.
- Fencing at lot boundaries shall be limited to 1.2 m high unpainted post and rail, post and wire or waratah and wire fencing. The addition of rabbit wire mesh is encouraged.
- Subdivision roading shall be asphalt or chip seal and have no kerb and channel.
- Shared paths within the recreation reserve and road reserve shall be local compacted gravel and/or schist stone.
- Planting for the road reserve, recreation reserve and private lots shall be undertaken in accordance with the planting palette in Appendix A of the RMM Assessment.

[7] Rule 7.3.6(x).

- Lot 30, planting shall be undertaken to provide visual screening of the built form on lots 5, 10-14 from viewpoints east of the site. Planting shall comprise:
  - Mitigation planting will consist of 40% *Kunzea serotina*, 40% *Leptospermum scoparium*, and 20% *Coprosma propinqua*.
  - Plants will be supplied at PB3 size or larger, and planted at a spacing of 3m centres to achieve sufficient coverage.
  - All plants shall have a slow-release fertiliser, wool mulch collar, and plant guard installed to deter rabbit and hare browsing.
  - A temporary irrigation system shall be installed and operation for the first three years from the date of planting to ensure quick and healthy establishment of plants.
  - All planting shall have been installed and healthy for a period of no less than three months from the date of planting prior to Council certification inspection.
- On Lots 1- 20 Buildings shall be subject to the following maximum heights:

Maximum Building Height & Roof Elevation (RMM Recommendations)

Lot Number(s)	**Maximum Building Height**	**Maximum Roof Elevation**	**Notes**
1, 2, 3	5m	269 masl	
4, 6	4.2m	269.2 masl	
5	4.2m	270.2 masl	
7, 8, 9	7.5m	269 masl	
10	5m	269.5 masl	
11, 12, 13, 14	4.2m	271 masl	Buildings to be stepped with grade
15, 16, 17, 18, 19	5m	265 masl	Buildings to be stepped with grade

20	5m	266 masl	Buildings to be stepped with grade

It is worthwhile to note that the mitigation of the adverse effects on the subdivision go beyond the extent of the development within the building line restriction area. Mitigation measures are proposed on Lots 1, 3, 7, 8 and 9 which are located entirely outside the BLR. Mitigation measures are also proposed on Lots 2, 10, 11 and 12 despite it being unlikely to occur because of the location of the BLR in relation to the lot boundaries, and possible to locate buildings on those sites outside the BLR.

The following table summarises the mitigation offered as part of the overall design concept of the subdivision, versus what would be permitted on those lots where buildings are located outside the BLR:

Permitted Baseline vs Volunteered Development Restrictions on lots located outside or substantively outside the BLR

Lot Number	**Maximum Permitted Building Height**	**Proposed Building Height**	**Maximum Permitted Coverage 40%**	**Proposed Building Coverage**
1	7.5m or 7m where >6°	5m	604m²	300m² and two-storey 200m².
2	7.5m or 7m where >6°	5m	600m²	300m² and two-storey 200m².
3	7.5m or 7m where >6°	5m	610m²	300m² and two-storey 200m².
7	7.5m or 7m where >6°	7.5	815m²	300m² and two-storey 200m².
8	7.5m or 7m where >6°	7.5	764m²	300m² and two-storey 200m².
9	7.5m or 7m where >6°	7.5	624m²	300m² and two-storey 200m².
10	7.5m or 7m where >6°	5m	608m²	300m² and two-storey 200m².

11	7.5m or 7m where >6°	4.2m	607m²	300m² and two-storey 200m².

The above identifies that the following lots would only be able to develop to less than what is permitted in the ODP zone rules, summarised as:

- Lots 1-3 and 10 would be 2m – 2.5m lower than otherwise permitted and approximately half of the building coverage area
- Lots 7-9 would be built to the same permitted height but building coverage would be between 500m² to 300m² less that what is permitted.
- Lot 11 would be built 2.8m lower than what is permitted, and the building coverage is approximately 300m² less than what is permitted.

The limitations on Lots 1-3, 7-9 and 10-11 illustrate an integrated approach to the proposal has been taken, with a focus on responding to the site's constraints at a broader scale than only where the future buildings on Lots 1-20 would be located within the BLR.

These matters are also referred to in the AEE below, and the volunteered conditions of consent in section 8.

3.4 Heritage

Attachment [B] contains a archaeological and heritage report by Kopuwai Consulting. That assessment describes the site, referred to as Water Race Hill and the adjoining Revell's Gully, and interconnected Slaughteryard Hill, as containing a significant and diverse array of recorded and un-recorded archaeological sites and features associated with early 1860's goldmining through to the 1930's.

There are four recorded archaeological sites within the Water Race Hill boundaries. However, there are many other archaeological features that have been identified through the site survey that have not been formally registered which are identified in the Kopuwai Consulting report, several new archaeological sites have been recorded and their registration pending over the wider area, and the following new areas recorded as being within the subdivision site (Table 5 of **Attachment [B]**).

New Unrecorded Sites				
Location	Name	Short Description	Site Type	Site Feature
Water race Hill	Historic fence	Hard wood post & wire	agriculture	Fence posts & wire
Various	Collieries	Coal mine – tunnels & processing	Mining	Tunnel, Shafts, Processing site remains

Slaughteryard Hill	Twin water races & lineal reservoir	Water races & lineal reservoir	Mining	Water races – enlarged water races

Associated heritage associations on site are former commonage grounds, farm steading, a historic main street stable site and hotel orchards.

The historic heritage elements found on Water Race Hill, have been grouped into the following categories:

1. Water races - main stem and minor distribution;
2. Sluice faces, sluice gulches, sludge channels and tailings;
3. Historic fences; and
4. Reservoir and stacked schist rock retaining features.

Note that of the above four groups of heritage elements, only the water races and the historic fences will be physically affected by the subdivision proposal.

The subdivision has been fitted around and within historic sluiced gullies and gulches constructively retaining the historic features and integrating them along with the landscape recreation values as a subdivision with defining and enduring points of difference. The heritage values are confined within the three non-residential lots (Lots 30, 40 and 51).

Figure 5 below identified the site with key heritage associated place names.



Figure 5. Site photograph with historical association areas labelled (Figure 2 of **Attachment [C]**).

The modifications to archaeological sites, areas to be destroyed, areas to be adapted and retained are set out in detail in the Kopuwai Consulting report, and are summarised in the AEE below. Recommendations to manage the heritage values in both the

construction phase and ongoing protection are set out in the volunteered conditions of consent at the end of this report.

3.5 Access

Access to the Residential Lots and the proposed reserve will be via an extension of Terrace Street and short loop road. The roads have a 20m legal width and will be formed to a chip seal with gravel shoulder and stormwater swales. **Attachment [E]** contains a transportation assessment from Bartlett Consulting which covers the effects of the activity on the wider Terrace Street area, and the subdivision's internal design against the ODP and the Council's code of practice. As noted above, access to Lots 2, 3 and 6 will be available via the proposed road network.

A noteworthy element is the access to Lots 6, 20 and 19 which are located near the crest of the escarpment. In order to maintain sight distances from these lots onto the new loop road (Lot 100), there will be a right of way with a fixed location which his shown on the Landscape Masterplan. From the right of way, the accesses for Lots 6, 19 and 20 can be from any location, noting that RMM recommend that earthworks associated with the access for Lot 6 to the right of way are minimised, which is included in the section 8 as part of the volunteered conditions of consent. Figure 6 below is a enlarged section of the subdivision plan (Attachment [A]), which illustrates the location of the right of way through lot 6.

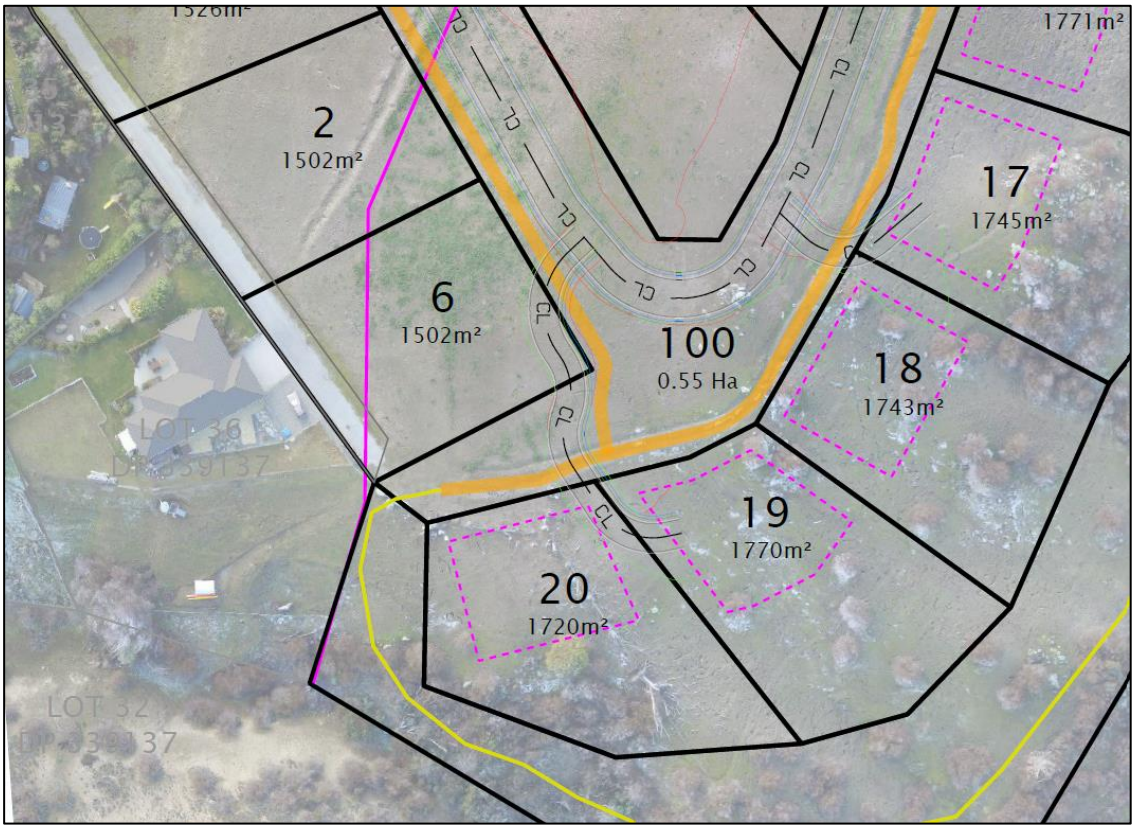


Figure 6. Excerpt of the subdivision plan illustrating the fixed location of the right of way to Lots 6, 19 and 20.

3.6 Servicing

Power and telephone services will be provided underground to the boundary of each residential allotment.

Proposed and existing water infrastructure is shown on the preliminary engineering layout plan and will be subject to detailed design for engineering approval.

Wastewater

The subject site has a number of Ø150mm uPVC foul sewer lines present. It is proposed that connection is made into two of the existing manholes on the property. One additional lateral connection direct to the existing network is also required to be made for Lot 1.

The new wastewater infrastructure to be provided is proposed to involve both conventional gravity sewer and private pumped sewer systems (as are common in other areas of Bannockburn and wider CODC area). Each type of wastewater infrastructure is identified on the preliminary engineering layout plan and will be subject to detailed design for engineering approval. In summary the preliminary design considerations are:

- Southern Ø150mm uPVC gravity sewer line of approximately 70m with 2 manholes;
- Southern Ø50mm HDPE pressure sewer line of approximately 235m;
- Northern Ø150mm uPVC gravity sewer line of approximately 160m with 4 manholes;
- Northern Ø50mm HDPE pressure sewer line of approximately 120m;
- Ø100mm uPVC gravity sewer lateral connections with cleaning eyes for Lots 1 – 12;
- Pressure sewer system boundary kit connection with backflow preventer (eg mono style) for Lots 13 – 20.

Lot 12 could also be serviced with a pressure sewer system, with the final consideration part of the design of the dwelling on the property and preference of the owner.

Where possible, wastewater infrastructure is proposed to be located within areas of land to vest in CODC (Lots 100, 101 and 51). In some areas, private property is traversed and will result in appropriate easements being registered across Lots 8, 9, 11, 12 & 40. Existing infrastructure will have easements registered across Lot 3 & 51 and possibly Lot 2 subject to confirmation of assets location.

3.6.1 Water

An existing Ø150mm PVC main runs along the Southern side of Terrace Street with Ø50mm rider mains servicing the Northern properties. A further Ø50mm HDPE dead end line services 36 Terrace Street (and a number of existing connections to the subject site).But in summary:

- One main loop of Ø150mm HDPE pipe traverses the proposed development (approx. length 590m),
- Extension of existing Ø150mm line to supply main loop (approx. length 25m),
- Extension and endcap of a Ø150mm line through Lot 40 to the NW of Lot 9 to allow for future network extension (approx. length 25m),
- Linkage of existing approx. 150m length Ø50mm HDPE dead end line to the main loop to create a looped rider main (approx. additional length 70m),
- New Ø50mm line to service Lots 4 & 5 (approx. length 20m),
- New Ø50mm line to service Lots 19 & 20 (approx. length 20m),
- New Ø20mm supply connections with toby box, etc. provided to Lots 4, 5 & 7 – 20,
- Lots 1, 2, 3 & 6 can make use of existing water supply points (refer below),
- Possible Ø20mm supply connections with toby box, etc. provided to Lots 30, 40 and/or 51 for Council maintenance/water fountains, etc. pending Council advice.
- Flexible HDPE pipe is typically preferred for water infrastructure as it allows for appropriate alignments and provides a robust system with noted longevity. This is the reason such construction has been chosen for this development.

Where possible, water infrastructure is proposed to be located within areas of road to vest in CODC (Lots 100 & 101). In some areas, to ensure a looped main is constructed, provide new connections and allow for future network extension, private property is traversed and will result in appropriate easements being registered across Lots 7, 8, 9, 11, 12 & 40. Existing infrastructure will have easements registered across Lot 2, 3 & 6.

3.6.2 Stormwater

Stormwater discharge in Bannockburn is typically via soakpit, however there are some existing sumps discharging to overland flow on the subject site. Soakpits are proposed to deal with stormwater from impervious surfaces on individual allotments and to discharge runoff generated by the roads associated with the development. Soakpit and sump locations indicated on the preliminary layout depict where stormwater is required to be captured and managed.

The final design, supported by geotechnical advice will be undertaken through engineering approval process.

3.6.3 Streetlighting

Extension of streetlighting down Terrace Street is proposed to continue in a similar manner until reaching the Building Line Restriction, which covers all intersections proposed by the development.

Where beyond the BLR, it is proposed that bollard style lighting is implemented to minimise the impact on local residents and those viewing the area from outside the development. There are a number of bollard style products available on the market, some of which are solar powered. Selection and approval of such products is a matter for engineering approval.

It is noted that streetlighting is only recommended in the transportation assessment, so the bollard lighting should be considered an optional inclusion and not necessarily a stringent condition applied to this consent.

3.6.4 Existing Connections

A number of existing connections are present (as installed upon historic development of Terrace St), but these do not align exactly with the proposed development. Detailed below are those lots proposed to make use of existing connections, with the remainder not being utilised upon this stage of development. Some may also be rendered redundant.

- Lots 2 & 3 have adequate service connections for wastewater and water available.
- Lots 1 & 6 have adequate water connections available.
- Lot 6 has existing provision for a wastewater connection, this pipe is not vested in CODC and the standard of the existing pipe will need confirmed. Alternately, Lot 6 can be serviced with a PSS system or minor upgrades to the existing network.
- Lots 1 & 3 currently have adequate standard street frontage with only a vehicle crossing required.
- Lots 2 & 3 would necessitate upgrade of the existing ROW, or extension of the existing Terrace St formation.

4 Background

4.1 2019-2021 Resource Consent RC190154

An application for resource consent was lodged with the Council in April 2019 for a subdivision on the Site comprising 38 lots for residential activity, roads and a reserve lot (3.5.9ha). A copy of the subdivision plan as lodged is in Figure 7 below. That application was for a non-complying activity resource consent because the minimum lot size of 1500m² and average lot size of 2000m² was not achieved.

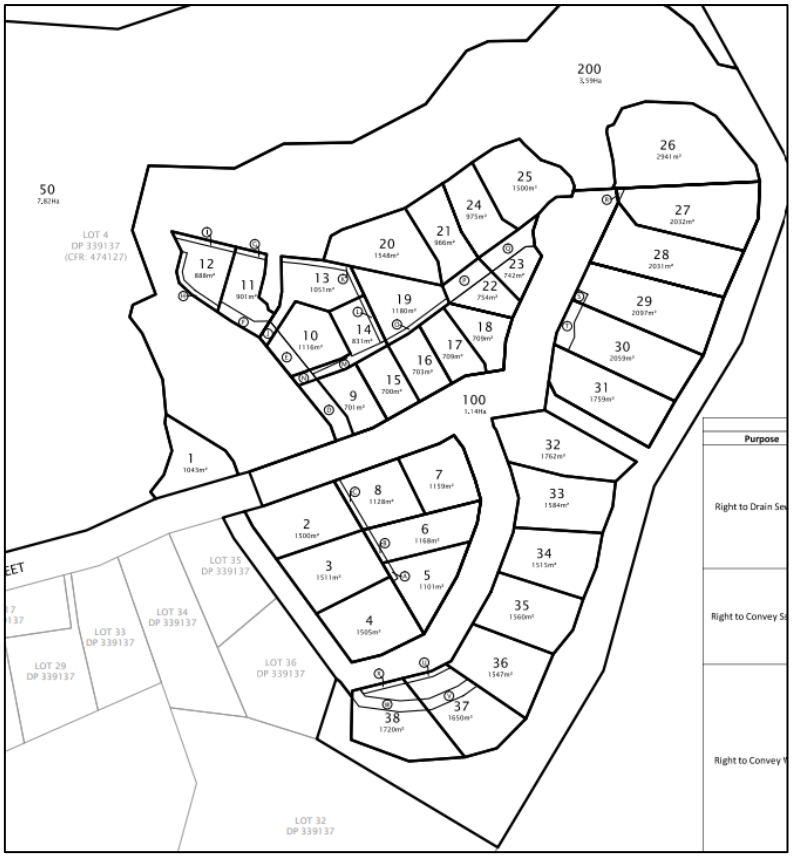


Figure 7. Subdivision plan from RC190154 (application as lodged).

In May 2021 the applicant responded to an information request with revised assessments and revised application material, including reducing the proposal from 38 lots, to 35 lots. The application was processed on a public notified basis and attracted over 100 submissions. The application has been on hold since the close of the submission period.

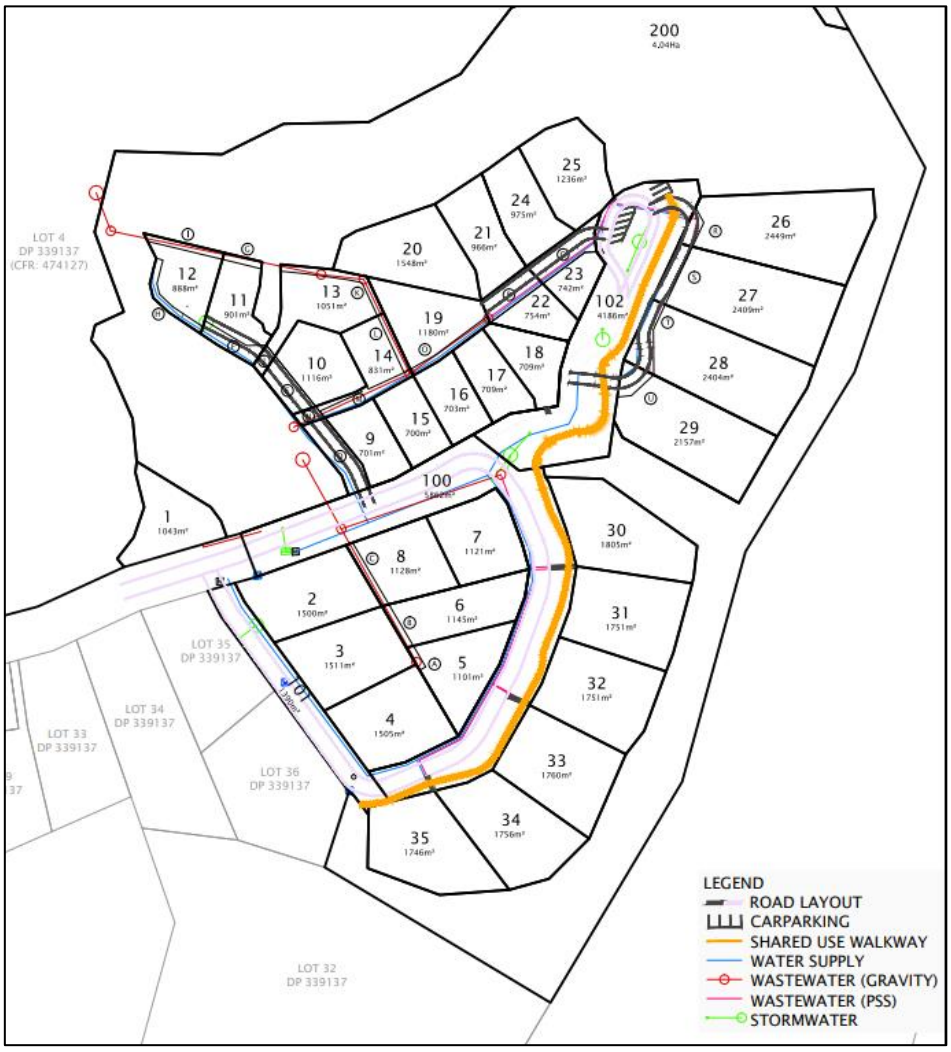


Figure 8. Subdivision plan from RC190154 (application as notified for submissions).



Figure 9. Subdivision plan from RC190154 (application as notified for submissions) illustrating the BLR.

4.2 2022 – 2023 Redesign

The applicant and its project team has considered the feedback received through the submissions, sought feedback on alternative subdivision design configurations with the owners of 34 Terrace Street and 36 Terrace Street, and undertaken meetings and received feedback from Council officers on the reserve design and vesting options, and advice from a peer review of the notified application documents by the Council's consultant landscape architect.

The revised proposed subdivision has taken on board feedback and comprises the following elements relative to the previous proposal:

- The minimum lot size of 1500m² and average lot size of 2000m² has been achieved, this complies with the anticipated residential density of the RRA(4) zone.
- An originally proposed road located along the western boundary of the site adjoining 34 and 36 Terrace Street has been removed. The existing access and right of way will not be affected and access will be via a road located on the northern side of Lots 2, 3 and 6. There are no new vehicle access rights at this location.

- Lots 5-8 as shown in Figure 9 have been removed providing greater visual relief to the existing properties on the southern side of Terrace Street.
- RC190154 would have resulted in 24 dwellings within the BLR. This application would result in 12 dwellings within the BLR (8 lots entirely within the BLR and 4 lots partially within the BLR). Those 12 dwellings located within the BLR area but will be subject to controls limiting building height, location, coverage and colours and materials.

5 Planning Framework

5.1 Reasons for Consent

5.1.1 Operative District Plan

The activity requires resource consent under the ODP for the following reasons:

- Rule 7.3.3(i)(c) states that subdivision is a restricted discretionary activity in the RRA(4) Area, providing the minimum allotment size of 1500m² and average size of 2000m² is met. The average allotment size of all lots (excluding proposed roads) exceeds 2000m².

  Council's discretion is restricted to the following matters:

  1. *The provision of adequate network utility services (given the intended use of the subdivision) and in particular the location, design and construction of these services.*
  2. *The location, design and construction of access to public roads and its adequacy for the intended use of the subdivision.*
  3. *The provision of landscaping, including road berms.*
  4. *Earthworks necessary to prepare the site for development occupation, and/or use.*
  5. *Subdivisional design including the shape and arrangement of allotments to:*
     - *Facilitate convenient, safe, efficient and easy access.*
     - *Facilitate access to passive solar energy sources.*
     - *Facilitate the safe and efficient operation and the economic provision of roading and network utility services to secure an appropriate and co-ordinated ultimate pattern of development.*
     - *Maintain and enhance amenity values.*
     - *Facilitate adequate access to back land.*
     - *Protect existing water races.*
  6. *The provision of or contribution to the open space and recreational needs of the community.*
  7. *The provision of buffer zones adjacent to roads, network utilities or natural features.*
  8. *The protection of important landscape features, including significant rock outcrops and escarpments.*
  9. *Provision for pedestrian movement, including the provision of walkways.*
  10. *The provision of esplanade strips or reserves and/or access strips.*
  11. *Any financial contributions necessary for the purposes set out in Section 15 of this Plan.*
  12. *Any amalgamations and easements that are appropriate.*
  13. *[Not relevant to this proposal]*
  14. *Any other matters provided for in section 220 of the Act.*
  15. *[Not relevant to this proposal]*
  16. *[Not relevant to this proposal]*
  17. [Not relevant to this proposal]

- Rule 12.7.7 Building Line Restrictions states that no building shall be erected within any building line restriction shown on the planning maps between the building line and the feature to which it relates.

  Lots 4, 5, 6, 13, 14, 15 to 20 are located either entirely within, or such that future buildings will be more likely than not located within the BLR.

  Rule 12.7.7(ii) identifies that resource consent is required for a restricted discretionary activity, with Council's discretion restricted to the following matters.

  1. *The effect on the natural character of water bodies and their margins.*
  2. *The effect on amenity values of the neighbourhood in particular the character of the streetscape.*
  3. *The effect on the safe and efficient operation of the roading network.*
  4. *The effect on infrastructure.*
  5. *The effect on the safety of neighbours.*
  6. *The effects of noise from the operation of the roading network and compliance with AS/NZS 2107:2000.*

5.1.2 Summary of consents required and activity status

The activity requires a resource consent for subdivision and locating future buildings within the building restriction area, both of which are a **restricted discretionary activity**.

5.2 Overview of Relevant Rules the activity is compliant with

5.2.1 Operative District Plan

The activity complies with the following relevant rules of the ODP, summarised below. **Attachment [H]** contains a more comprehensive summary of the relevant rules. :

- Subdivision of land subject to hazards (Rule 7.3.4(ii)).
- Building on land subject to hazards (Rule 7.3.5(ii)).
- Earthworks which limits extraction of material to 1m depth within 2m of a boundary (Rule 7.3.6).
- Roading and Access
  - Construction and Maintenance, 12.7.1 (i) – That any vehicle crossing (including private shared access ROW) should have a sealed surface and the access is formed to meet the requirement of a Right of Way[8] which are to intersect the road boundary within 15 degrees of a right angle. The vehicle crossings must not impede or restrict roadside drainage facilities. This rule can be met.

[8] Refer Central Otago District Council, Addendum to NZS 4404:2004, July 2008.

- Sight Distance, 12.7.1 (ii) – That any vehicle crossing (including private shared access ROW) should have 40m sight distance in each direction based on the 50km/hr speed limit.
- Access to Urban Local Roads, 12.7.1 (vii) – That any vehicle crossing (including private shared access ROW) are to have a sealed surface (similar to the adjacent road).

- Heritage buildings, places and objects (Rule 14.7.1), which controls removal, alteration or demolition of heritage items identified and scheduled in the ODP, or with the NZ Historic Places Trust. The site does not contain any scheduled items.

- The site does not contain any notable trees (Rule 14.7.2).

- Archaeological Sites and Waahi Tapu (Rule 14.7.4) states:

  (i) Archaeological Sites Where any activity disturbs or identifies the presence of an archaeological site, all work shall cease, and the following process shall be followed:
  (a) Where the site is registered or the find or site includes koiwi tangata (unidentified human remains) Rule 14.7.4 (ii) and/or (iii) shall apply.
  (b) Where the site is not registered or koiwi tangata do not occur, the provisions of sections 9 to 21 of the Historic Places Act 1993 shall apply.

  (ii) Registered Sites (refer Part A - Schedule 19.4)

  Any activity that is likely to modify or disturb or affect any archaeological site or waahi tapu site listed in Part A of Schedule 19.4 shall be considered as a non-complying activity.

  Note: the provisions of sections 9 to 21 of the Historic Places Act 1993, will also apply to these activities.

  (iii) Koiwi Tangata (unidentified human skeletal remains)

  With regard to Rule 14.7.4 (i), the site contains archaeological sites associated with former mining and early European settlement. The archaeological sites present on the application site are not registered in the District Plan, therefore rule (b) applies and the HPA 1993 applies, being its replacement legislation the Heritage New Zealand Pouhere Taonga Act 2014 (**HNZPTA**).

  The HNZPTA makes it unlawful to destroy or modify the whole or part of an archaeological site without the prior authority of Heritage New Zealand. This is a separate statutory process to obtaining any resource consents required under the District Plan.

  In terms of Rule 14.7.4 (ii) the site does not contain any registered sites in Schedule 19.4 of the District Plan.

  For Rule 14.7.4 (iii), there is no evidence suggesting the site contains Koiwi Tangata.

- Minimum access width (urban areas) (Rule 16.7.4).

- Maximum gradients for carriageways (Rule 16.7.6).

Attachment [H] contains a full summary of the relevant ODP rules assessed against the proposal.

5.2.2 Plan Change 19

The Council has reviewed the ODP residential zones and notified Plan Change 19 in 2022, hearings were held in April and May 2023 with no decision on submissions at the time this application was made.

The Site is zoned Large Lot Residential under the PC19 framework. No PC19 rules were notified with immediate legal effect, and no consents are required under PC19.

5.2.3 NESCS

The National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NESCS) is a nationally consistent set of planning controls and soil contaminant values. It ensures that land affected by contaminants in soil is appropriately identified and assessed before it is developed - and if necessary the land is remediated or the contaminants contained to make the land safe for human use.

The NESCS is relevant because mining has been undertaken on the land, and the proposed use of land involves a subdivision. A preliminary site investigation and detailed site investigation has been commissioned by Engeo and is in **Attachment [D]**.

Regulation 8(3) restricts the volume of the disturbance of the soil of the piece of land to no more than a volume of 25m³ per 500m² area.

Regulation 8(4) of the NESCS allows land-use change or subdivision of a piece of land as a permitted activity where it can be demonstrated it is highly unlikely that there will be a risk to human health given the intended activity.

ENGEO consultants have undertaken both preliminary and detailed site investigations and the contamination detected was below the thresholds under the NESCS for recreational, residential or commercial / industrial guideline criteria. The subdivision and development does not require any resource consents under the NESCS.

5.3 Other Approvals Required

The application will also require the following approvals not sought as part of this application.

5.3.1 Regional Plan Water for Otago

A resource consent will be required under Otago Regional Plan Water (**RPW**), Rule 14.5.1 for earthworks associated with residential activity which exceeds 2500m² in a 12-month period.

The purpose of Rule 14.5.1 and associated policy (introduced in 2021) is to control potential erosion and sedimentation adverse effects associated with residential subdivision and development earthworks and construction activity.

A resource consent application will be made to the Otago Regional Council following the subdivision and land use resource consents. The RPW residential subdivision and development rule framework controls the temporary construction related effects associated with earthworks activities. There are not any reasons to defer the processing and grant of the subdivision and land use resource consent prior to resource consents being obtained under the RPW.

Attachment [F] contains a preliminary earthworks plan and an erosion and sediment control plan, which has been provided primarily for information purposes. Earthworks would not be able to commence until resource consent is obtained from the Otago Regional Council and it is anticipated that that agency will be the primary consent authority to report to in terms of the management of adverse effects from dust and stormwater associated with earthworks activities.

5.3.2 New Zealand Pouhere Taonga Act 2014 (HNZPTA)

The NZHPTA identifies that an archaeological site is any building or structure that was associated with human activity that occurred before 1900 and provides or may provide evidence relating to the history of New Zealand. The HNZPTA requires an authority is obtained from Heritage New Zealand for an activity that will or may modify or destroy the whole or any part of any archaeological site.

The Site contains archaeological sites associated with early European settler occupation and several of these would be modified as part of the subdivision development. The identification of the areas to be modified and retained are summarised in this application and elaborated upon in greater detail in the Kopuwai Consulting assessment in **Attachment [C]**.

Obtaining the resource consent first provides a greater degree of certainty as to the overall design of the proposal and which archaeological items will be modified through the archaeological authority process. There are no restrictions identified in the context of the RMA associated with obtaining the subdivision and land use resources consents first.

6 Assessment of Effects

In accordance with Section 88 and Schedule 4 of the RMA an assessment of any actual or potential effects on the environment that may arise from the proposal is required with any details of how any adverse effects may be avoided, remedied or mitigated. Accordingly, the below is an assessment of effects relative to the scale and significance of the proposed activity.

Guidance has also been taken from the Council's Form 28 which notes that the matters on that form can be used as a template in an assessment of effects.

This assessment is addressed under the following headings:

- Permitted Baseline
- Landscape and Visual Amenity
- Heritage
- Earthworks, Natural Hazards and Site Stability effects
- Access and Transport
- Servicing
- Erosion and Sediment Management
- Positive effects

6.1 Permitted Baseline

Sections 95D(b), 95E(2)(a) and 104(2) of the RMA provide discretion to Council (for the purposes of forming an opinion as to actual or potential effects) to disregard any adverse effects of the proposal on the environment (or on a person) if the District Plan or National Environmental Standard permits an activity with that effect.

The ODP requires at a minimum a restricted discretionary activity for subdivision and no permitted baseline applies to this activity.

Notwithstanding this, for context, the RRA(4) rules in the ODP permit residential activity and buildings, the exception in this case being that Rule 12.7.7 requires a restricted discretionary activity resource consent for buildings within a BLR.

While there is no permitted baseline in the context that effects can be disregarded, it is not fanciful to anticipate residential subdivision and development on the Site outside of the BLR. The permitted building height and building coverage available to buildings on Lots 1-3, 7-9, 10-11 is substantially greater than what is proposed by this application (see comparison above).

6.2 Landscape and Visual Amenity

The description of the site and environment is set out in section 2 above, and the key mitigation measures are set out in section 3, with those included in section 8 below as part of the overall volunteered mitigation measures.

As noted above, the RMM landscape assessment in **Attachment [B]** has identified and discussed the adverse effects of the proposal in detail, focusing on the following aspects:

- Effects associated with the breach of the BLR.
- Effects on the character, amenity, and settlement pattern within Bannockburn.
- Effects on the natural character of the Kawarau River and Bannockburn Inlet.
- Effects on the site's values including the open and rural character and the perceived ruggedness and naturalness of the site's landforms and vegetation patterns.
- Effects on the heritage and recreation values of the site, including on specific archaeological features. Refer to Kopuwai Consulting report for a full commentary on archaeological, heritage, and recreational amenity matters.
- Visual amenity effects from public places within the surrounding area, particularly from locations east of the site, as well as from Bannockburn township and neighbouring private properties and businesses.

The following summarises the RMM assessment and where relevant provides an overview of the broader resource management considerations.

6.2.1 Effects associated with the breach of the BLR

The BLR follows the ridgeline of Water Race Hill surrounding an area of lower landform. The RMM assessment identifies that it is understood that the original purpose of the BLR was to contain Bannockburn within a 'hollow' so it would not be visible from the Cromwell Basin and to protect views around the Bannockburn Inlet.

The sensitivity of the elevated and exposed topography (escarpment) of the area of the site within the BLR overlay has required careful design of the subdivision proposal. The lots that are located within the BLR are generally viewed in the context of other existing built form and will appear as an extension of built form along Terrace Street. The recommended design controls including reduced (500m2) building platforms on those lots within the BLR area , height limits, planting mitigation and rules regarding materials and colour will ensure that the proposed built form within the BLR will not result in unacceptable adverse effects.

Visual amenity effects associated with visibility of built form within the BLR are discussed as part of the visual assessment below and in the RMM report, and summarised below.

6.2.2 Effects on the character, amenity, and settlement pattern within Bannockburn

The landscape of the subject site has the capacity to be developed in line with the provisions for the RRA(4) zone. The CODC promotes an open form of development within RRA(4), allowing for low density residential activity within the zone so long as any such development maintains the character of Bannockburn.

The proposed residential lot sizes comply with the minimum size as set out in the provisions for RRA (4) and are consistent with lot sizes on Terrace Street and within the centre of Bannockburn. In addition to the 20 proposed residential sites, Lot 30 will be vested with Council as a public reserve, Lot 40 will remain in private ownership to be used for rural productive activities such as grazing, and Lot 50 will serve as a balance lot. As a result, a dominance of open space will remain and development patterns will be consistent with existing settlement within Bannockburn.

While the proposed subdivision does constitute an extension of the semi-urban form of Bannockburn, this change can be anticipated based on the residential zoning and the proposal seeks to maintain the specific rural character and amenity of Bannockburn and the wider receiving environment through adherence to the minimum lot size and the use of design controls which are more conservative than the District Plan provisions.

The proposal will maintain open space, rural outlook, and recreation amenity through the designation of a public reserve and the establishment of Lot 40 and the balance lot (Lot 50). It is therefore considered that the proposal will not result in adverse effects on the character of Bannockburn.

6.2.3 Effects on the natural character of the Kawarau River and Bannockburn Inlet

The RMM assessment identifies the natural character of the Kawarau River and Bannockburn Inlet as important values. As described previously, the natural character of the Kawarau River and Bannockburn Inlet are derived from natural qualities such as the colour and clarity of the water, the incised gorge of the river, the irregular shoreline of the Inlet, and the surrounding topography of hills and terraces as well as the perceived naturalness of the vegetation patterns on the surrounding terraces, gullies, and river margin.

Potential adverse effects on the natural character of the Kawarau River and Bannockburn Inlet are primarily related to the proposed development of lots 15-20 on the east facing escarpment above the Inlet.

Regarding potential adverse effects on the natural character of the Bannockburn Inlet, the proposed built form within the BLR will result in new built form on the slopes above the Inlet. While located well away from the water body margin this will constitute a modification to the landforms surrounding the inlet which contribute to its natural

character. As a result, it is likely that built form on the terraces surrounding the Inlet will result in a reduction in natural character. This is considered to be an adverse effect of a low-moderate degree.

6.2.4 Effects on the site's values

The proposed subdivision will result in a substantial change to the site through the introduction of built form, roading, street trees, and amenity planting. This will result in a reduction in the perceived naturalness and ruggedness of the site, a reduction in the open and unbuilt nature of the site, and a reduction in rural amenity and the working rural character.

While these changes are largely anticipated given the underlying zoning, the proposed level of development is potentially greater than would be expected for the site given the breach of the BLR and therefore it is anticipated that adverse effects on the values of the site will be low-moderate. However, considering the proposal overall, the establishment of Lot 30 as a local reserve and Lot 40 and 50 as balance lots, the site will retain a dominance of open space and rural amenity.

As noted above, the design of the subdivision development and the associated mitigation has taken a collective approach with lots outside the BLR subject to design controls which go significantly beyond the bulk and location permitted baseline in the ODP. This, coupled with the careful management of heritage values will result in a subdivision that responds well to the site and its constraints.

6.2.5 Effects on the heritage and recreation values of the site

The layout of the proposed subdivision acknowledges and seeks to maintain where possible the heritage values of the subject site. The Kopuwai Consulting report provides further recommendations to ensure these values are retained.

A significant positive outcome from the proposal is the allocation of Lot 30 as a vested public reserve. This is to provide opportunities for recreation with potential to establish a look out for viewing the Bannockburn Inlet and the mountain ranges in the distance. In addition, a series of informal paths are proposed through the road reserve (Lot 100) and Lots 30, 40, 51, and 50 which will provide recreation opportunities and establish long term connectivity to Bannockburn Inlet for all Bannockburn residents.

6.2.6 Visual amenity effects from public places within the surrounding area

RMM have assessed the visual amenity effects of the activity from 11 representative viewpoints experienced by the public comprising Bannockburn Inlet, Bannockburn Boat Ramp, Cairnmuir Road, Patersons Road, Bannockburn Road, and Terrace Street.

Views from these viewpoints have been assessed in the context of understanding the degree of change and the extent to which that change is adverse. The following table summarises the RMM assessment from each of the 11 identified view points:

Viewpoint	Distance from Site	Adverse Effects	Summary of Visual Effects
1 Cromwell Historic Precinct	5kms	Low	Views from the historic precinct are considered significant because of its high recreational values. The visibility of the proposed development will be barely noticeable and constitute only a very small component of the view. The proposal will be readily absorbed by the surrounding landscape and, if discernible, will likely be seen alongside recent adjacent residential development.
2 Cairnmuir Road near Bald Hills Vineyard entry	2.4kms	Low	Values portrayed include rural character and amenity, attributed to the dominance of rural productive activities and lack of built form, and high scenic quality, attributed to the visibility of the Kawarau River and the scenic backdrop of the mountains. Future dwellings on lots 15 – 20 on the south end of the east escarpment as well as lots 13 – 14 will potentially be visible as well as partial roof lines of dwellings on lots 4 – 6 and 9 which may breach the edge of the terrace landform. However, the proposed built form will be viewed against a backdrop of foothills and mountain ranges and in the context of visible built form along Terrace Street, Hall Road, and Domain Road as well as productive land uses and rural lifestyle properties in the foreground. The proposed design controls will further integrate the proposed development into the existing landscape. The proposal is viewed from a long distance, is small in the context of the scene and will not contrast with the

			existing pattern of settlement visible from this viewpoint. As a result, The adverse effects on the visual amenity will be very low. The proposal will integrate seamlessly into the current visual environment with very little material loss to the rural amenity and scenic quality of the overall scene.
3 Cairnmuir Road near Carrick Winery & Vineyards and Cairnmuir Motor Camp	900m	Low-Moderate	From this viewpoint location, there will be clear views of dwellings on lots 15 – 20 on the south end of the escarpment, due to the elevated position of these lots. Dwellings on lots 12 – 14 will also be visible and the dwelling on lot 9 will be partly visible through the gully due to the angle of the view. Roof lines from dwellings on lots 2 – 5 and 9 – 11 are likely to protrude above the edge of the terrace landform though will be largely screened by street trees and the mitigation planting once established. The proposed built form will be viewed against a backdrop of foothills and mountain ranges and in the immediate context of visible built form along Terrace Street which is visible in the current view to the south-west of the site and west through the gully towards Bannockburn village centre. Earthworks within lots 100 and 101 for the road and the walking track will also be somewhat visible in the short term. The magnitude of change as experienced from this viewpoint is considered to be low due to the small scale of the proposal in the scene. Further, in the context of the existing visible development, the proposed design controls and mitigation planting, it is likely that the proposal will not contrast significantly with the existing scene and will appear as an extension to existing visible built development. This change will result in a small reduction in rural amenity and scenic quality due to the temporary effects of

			earthworks and the increase in built form on Water Race Hill. It will also contribute to a minor loss in the visual simplicity of the site as perceived from this location.
4 Lake Dunstan Trail near the Carrick Winery	800m	Low-moderate	Future dwellings on lots 12 – 14, and 15 – 20 will be visible. Roof lines from lots 4, 5, 10 and 11 may also be visible, protruding above the edge of the terrace landform though will be largely screened by street trees and the mitigation planting once established. The future dwelling on lot 9 may be partly visible through the gully. The proposed built form will be viewed against a backdrop of foothills and mountain ranges and in the immediate context of the adjacent visible built form along Terrace Street. Earthworks within lots 100 and 101 for the road and the walking track will also be somewhat visible in the short term. This change will result in a small reduction in rural amenity and scenic quality due to the temporary effects from earthworks and the increase in built form on Water Race Hill.
5 Bannockburn Boat Ramp and Swimming Area	800m	Low-moderate	Lots 15 – 20 will be visible at the south end of the east facing escarpment due to the elevated position of these lots. Buildings situated within these lots will not break the skyline but will be readily noticed by an observer, forming a visible and recognisable element within the overall scene. The proposed design controls will aid in visually settling future dwellings into the existing landscape. In addition, dwellings within lots 5, 10 – 14 may also be potentially visible as the roofline of these dwellings may breach the edge of the terrace landform. However, these dwellings will be seen against a backdrop of the Carrick

			Range and are anticipated to be mostly screened by the proposed mitigation planting in time. Earthworks within lots 100 and 101 for the road and the walking track will also be somewhat visible in the short term. Dwellings on lots 15 – 20 will be visible but will form a small part of the overall scene and will not be visually dominant due to the specification of design controls including building height, platform areas and aesthetic design standards. However, from this viewpoint, this is likely to be the only built form visible and therefore a new element in the view. This change will constitute a minor loss of the key values for this scene, being rural amenity, the ruggedness of the topography, and the sense of containment due to the temporary effects of earthworks and the introduction of built form on an elevated and currently open hillside.
6 South of Bannockburn Recreation Reserve	200m	Moderate	The dwellings on lots 5 and 15 – 20 on south end of the escarpment will be visible, although setback from the Inlet. It is anticipated that future dwellings located on these lots will potentially break the skyline when viewed from this location. They will also form a new element in the scene, being the only dwellings visible from this location. Street trees and mitigation planting will also be visible and will partly screen the dwelling on lot 5 while also forming a backdrop to built form on lots 15-20. Earthworks within lots 100 and 101 for the road and the walking track will also be somewhat visible in the short term. This change will result in a reduction in the rural amenity and scenic quality of this view, through a change to the open and unbuilt nature of the hill and the ruggedness and visual simplicity of the

			upper pasture due to the introduction of built form and earthworks
7 Bannockburn Recreation Reserve	500m	Low - moderate	From this location, only the dwellings on the end lots on the escarpment (lots 15 – 20) will potentially be visible, they will be partly screened by the existing landform and vegetation in the foreground. Proposed mitigation through design controls will help to reduce the visual prominence of these dwellings. Future dwellings located on these lots will be partially visible and will potentially break the skyline when viewed from this location. They will also form a new element in the scene, being the only dwellings visible from this location. This change is likely to result in a small reduction in the rural amenity and scenic quality experienced from this view due to the presence of built form on the hillside.
8 Patersons Road	900m	Low-Moderate	There will be clear views of lots 15 – 20 on the south end of the escarpment, due to the elevated position of these lots. Roof lines from lots 2 – 6 and 9 – 14 may also be somewhat visible as they are likely to protrude above the edge of the terrace landform. Proposed mitigation planting and street trees will, in time, largely screen the built form within lots 2 – 6 and 9 – 14. Built form will be viewed against a backdrop of foothills and mountain ranges and in the immediate context of existing visible built form to the left (south-west) of the site

			which includes dwellings within Bannockburn. The magnitude of change as experienced from this viewpoint is considered to be low due to the small scale of the proposal in the overall scene. In the context of the existing visible development, the proposed design controls and mitigation planting, it is likely that the proposal will not contrast significantly with the existing scene and will appear as an extension to existing visible built form.
9 Bannockburn Road	Along the west boundary of the site and across the road from Black Rabbit Café and the Bannockburn Hotel.	Low-moderate	Future dwellings on lot 1, 7-13 will be potentially visible, rooflines of dwellings on lots 2 – 6 may also be partially visible. These dwellings are, for the most part, not in breach of the BLR so could be reasonably anticipated based on the underlying zoning.
10 Terrace Street	West boundary of the site at end of Terrace Street.	Low-moderate	Lot 1 will be visible in the foreground taking up a considerable portion of the view on the left side of the scene with lots 7, 8, 10, 11, and 12 visible along the same side of the road in the mid-ground. Lots 1, 4, and 5 will be visible on the right side of the scene along the main road. These dwellings are, for the most part, not in breach of the BLR so could be reasonably anticipated based on the underlying zoning.
11 Terrace Street and is oriented toward the east	200m	Negligible	Built form on lots 1, 3, 4, 5, 7 and 10 may be partly visible. These dwellings are, for the most part, not in breach of the BLR so could be reasonably anticipated based on the underlying zoning.

6.2.7 Summary of Visual Effects

The effects of the proposal on the existing visual amenity will extend beyond the site but are relatively contained. The more distant views (Viewpoints 1 & 2) will be viewed against a vast and complex landscape, making the proposed development difficult to discern and result in adverse effects from negligible to very low. Views near to the site from the east, from around the Bannockburn Inlet, Cairnmuir Road and the surrounding rural environment (Viewpoints 3-8) are most relevant and potentially most impacted, as demonstrated from the key viewpoints identified, adverse effects from viewpoints in this area range from low-moderate to moderate. Views from Bannockburn township to the west of the site (Viewpoints 9-11), while also impacted, portray a different character given the existence of residential built form in the context, resulting in effects from negligible to low-moderate.

Overall, the RMM assessment concludes that the adverse effects on visual amenity overall are low-moderate and consider this degree of effects to be appropriate. The adverse effects on landscape values will be minor.

6.3 Heritage

The Kopuwai Consulting report in **Attachment [C]** has identified the archaeological features present, and the extent they will be modified. The following summarises the and extent of effects on heritage values and the recommendations of the Kopuwai Consulting report detailed below as volunteered conditions of consent in Section 8 below.

Historic elements identified over the wider site (i.e. the area subject to subdivision and balance land) are:

- Water races.
- Sluice faces; Sluice gulches.
- Sludge Channels.
- Tailings – stacked & revetted.
- Old hardwood post and wire fence lines - Ex Farm steading/commonage grazing.
- Coal pits prospects & underground measures
- Old flume/pipeline site – Revell’s Gully.
- Artefacts insitu and scatters

The key heritage features potentially affected by the proposal are:

- heritage water races
- historic fences, and

- heritage landscape character.

6.3.1 Water Races

The upper portion of the two twin races F41/369 within Lot 30 will be retained. Adaptively repurpose all of the lower water race into a schist metalled narrow foot path within the remnant water race structure, with appropriate residential drive crossing treatments which allow combined residential driveway use and allow active access and egress along the pedestrian footpath on the adapted downslope water race berm.

The upper race portions of the water race within the road reserve will be destroyed and less legible portions traversing residential Lots 2, 4, & 6 would be likely to be modified subject to building platform location and earthworks. As shown in Figure 10 below, it is likely the entirety of the water race through Lot 2 where it crosses centrally through the lot will be destroyed to facilitate residential development.

Within the proposed road, the key portion of the upper race within Lots 30 and 40 leading to the flume pipe abutment for crossing Revell's Gorge will be retained with the lower race being adaptively repurposed as a metal footpath to meaningfully preserve and maintain it as a key part of the wider heritage landscape and gold mining fabric component.

The loss of the other identified minor water components servicing various other minor sluicing's was acknowledged, as was the protecting of the respective Pennyweight Sluice faces and others around the wider perimeter that the subdivision was designed around to preserve. The new road reserve includes sections of twin historic water races; the upper race F41/369 will have southern extents destroyed and disturbed with the lower race a branch of F41/369 will be preserved by adaptive reuse as an active path with respective treatments for roadway and driveway crossings to integrate the subdivision development.

Apart from the destruction of the southern 40 percent of the upper race F41/369 the majority of the water race proposed for destruction are minor shallow earth bunded invert water races that have low visual appearance, with low structural presence and therefore little meaningful contribution to the wider historic mining system and its interpretation.

Of a total distance of 1704m of water race:

- 526 m (31%) is proposed for destruction.
- 433 m (25%) is proposed for retention and preservation.
- 745 m (44%) m is proposed for adaptive reuse.

Collectively, 1178 m (69%) of 1704 is combined for preservation and adaptive reuse.

Appendix 1 figure 3 of **Attachment [C]** illustrates water races proposed to be retained, removed or repurposed, shown in Figure 10 below.

Overall, the Kopuwai Consulting assessment supports the destruction of the water races in the locations identified on the basis the areas supported for retention and adaptive use are undertaken. The adverse effects of the areas of water race which will be lost are minor in the context of the protection of the remainder of the race and its re-use as part of the subdivision development.

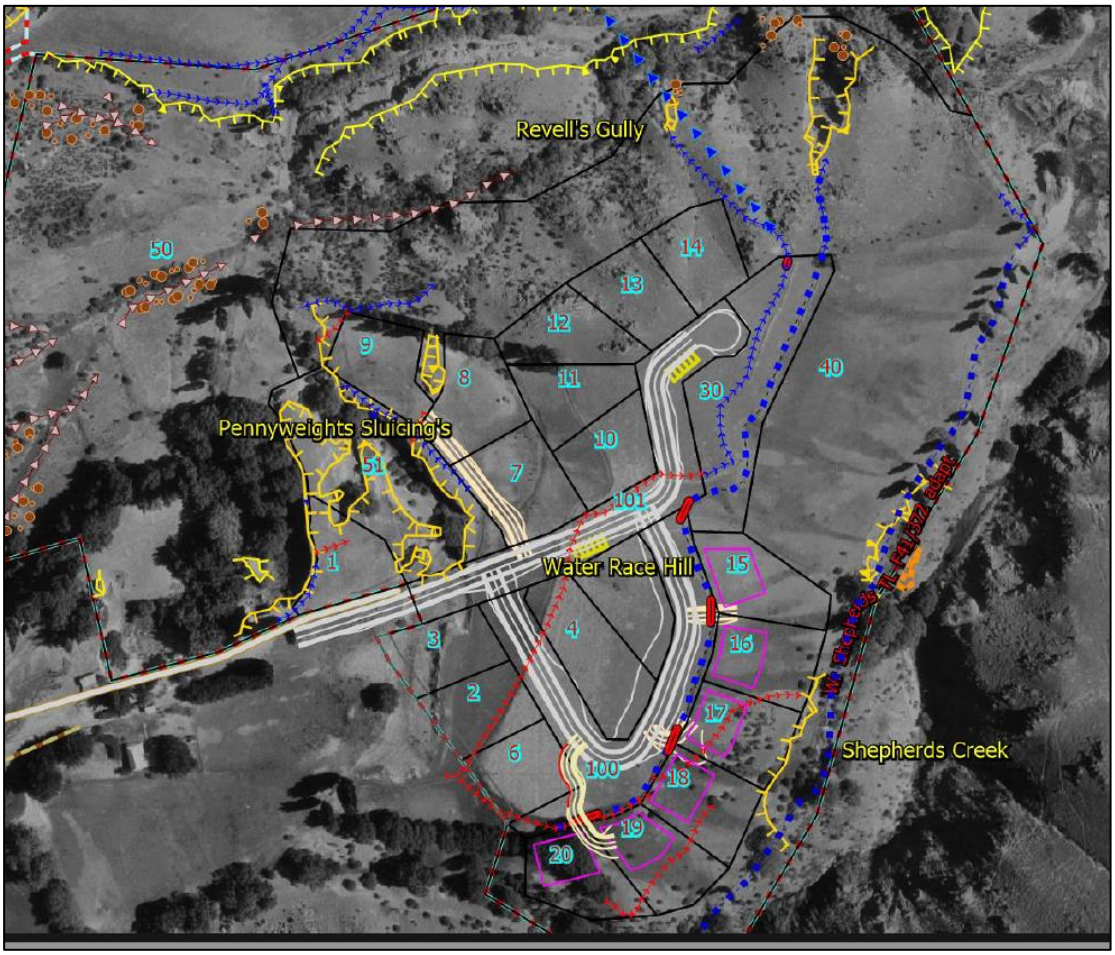


Figure 10. Water Race Modification. Red lines indicating the water races to be destroyed, blue lines indicated retention of water races.

6.3.2 Heritage Fences

The heritage sections of fence line identified and assessed for removal have been damaged with old tree windfall, lack of maintenance due to retirement from stocking and indiscriminate public access cutting through sections of fence line. Coincidently these more degraded sections are sited between and through the proposed lots.

As such they have little residual capacity to contribute as meaningful lot boundary fences. Any posts considered practicable for salvaging are being recommended for ongoing repair and maintenance for the heritage fence line identified for retention along the Lot 4 Shepherd's Creek boundary.

The Kopuwai Consulting report also suggests that if any fence posts are not reused immediately and need to be retained, the fence posts could be stockpiled within Lot 40,

and could be utilised by a local volunteer group (such as the Goldfields Heritage Trust) if the posts along the Shepherd's Creek Lot 4 boundary need to be replaced.

The partial removal of a section of the early farmstead fencing boarding Lots 9, 8, 11, 12, 13, & 14 and through Lot 20 is supported subject to storing and reusing the salvageable old fence posts and material on maintaining the fence lines being retained especially along the Shepherd's Creek Lot 4 boundary in parcel 40.

Of the total length of remaining fencing of 853 m:

- 320 m (37.5%) of fence line will be removed and post salvaged where possible; and
- 533 m (62.5%) of fence line will be retained.

Appendix 1 Figure 7 of **Attachment [C]** identifies the fences within the subdivision that are proposed to be removed or retained, and is reproduced in Figure 11 below.

The Kopuwai Consulting report supports the removal of the fences as shown below subject to the recommendations which are volunteered as conditions of consent in Section 8 below.

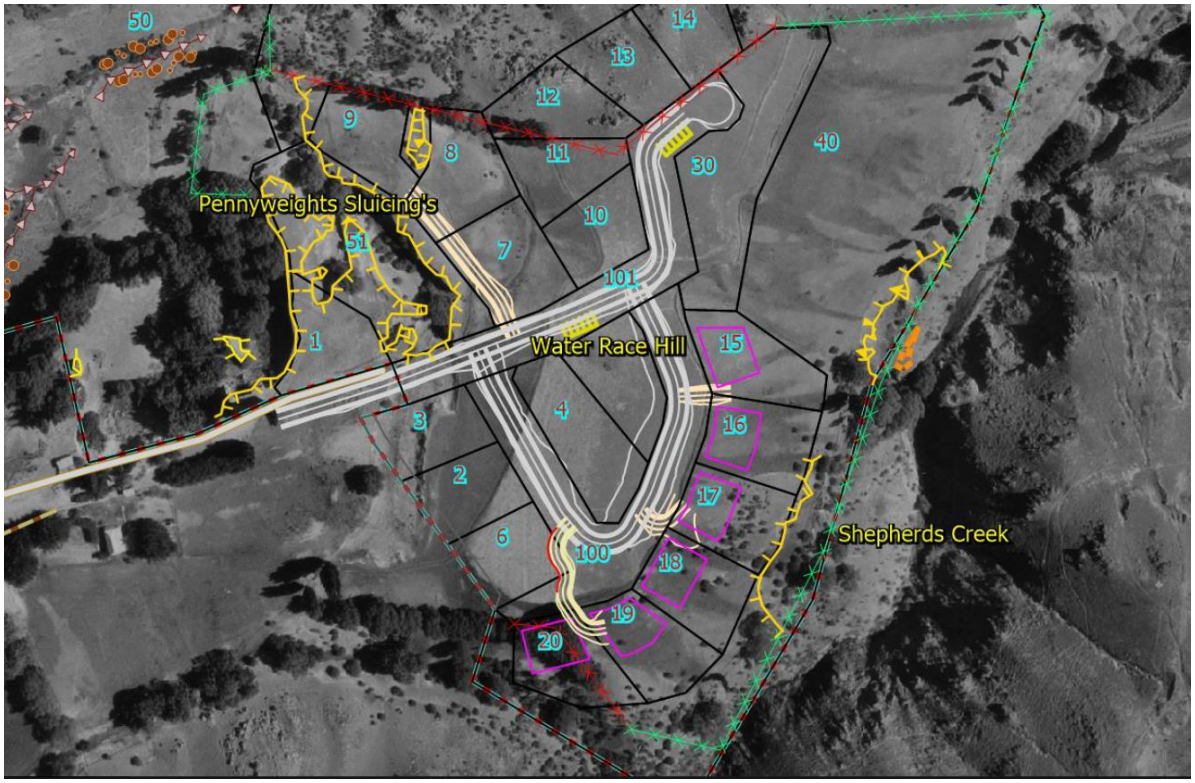


Figure 11. Historic Fence modification. Red lines indicating the sections of fence to be removed, and green lines identifying their retention.

6.3.3 Effects on Archaeological Items within each lot

Table 9 of **Attachment [C]**[9] identifies the effects on archaeological items for each lot which contains an identified archaeological item. The recommendations are incorporated into Section 8 below as volunteered conditions of consent.

6.3.4 Effects on Heritage Landscape Values

The Kopuwai Consulting report identifies that the site is part of a landscape of regional value, with 'averagely well-preserved' historic landscapes with reasonable coherence, time-depth, and rich and diverse array of historic industries. The heritage landscape has high context to the main street, nearby heritage landscapes (private & public) along the historic Kawarau River terrace sequences, in particular the Landmark Bannockburn Sluicing's Historic Reserve.

The prominent landforms of Slaughteryard Hill and Water Race Hill off Terrace Road between Shepherd's and Revell's Gorges have their own significant contribution to the wider landscape and past cultural history.

The setting from a wide view is experienced and appreciated by locals and the wider community and while some disturbance and modification has occurred in portions, the whole is an appreciated asset.

The water race hill subdivision proposal will have a minor to moderate effect on the heritage landscape through its visual intrusion on what is at present an open and legible landscape with the past endeavours, particularly of alluvial goldmining and farm steading clear and present on the current landscape.

The modification to heritage items in the area undertaken in the past, and the proposed modification through this activity mean that it is important that meaningful interpretation to explain what remains is deployed to help provide context to what was once a larger and more coherent heritage landscape.

For this reason, the Kopuwai Consulting report supports the proposal on the basis the adaptive reuse of heritage items and protection of other items to be retained is carefully undertaken as part of the subdivision development and ongoing residential land use.

6.3.5 Conclusion Archaeological and Heritage

The destruction of the archaeological items have been carefully considered and the retention and incorporation of the archaeological areas to be retained or adapted is

[9] Table 9 Revised Table of subdivision effects on archaeological features by proposed subdivision (RC2 01 REV C 2023) by parcel with archaeological comments & recommendations. At [60].

able to be undertaken in a sensitive and sympathetic manner. Adverse effects on the archaeological values will be minor.

The overall impact on the heritage values and heritage landscape context needs to be considered in the context of the zoning which permits residential development. While there will be change, this is not change in isolation and the development is considered to be an anticipated extension of the settlement of Bannockburn. The adverse effects are minor.

6.4 Earthworks, Natural Hazards and Site Stability effects

6.4.1 Earthworks

The earthworks will be undertaken on an alluvial terrace that is considered to be relatively isolated from any nearby waterbodies, however, contains gullies and depressions which are likely to operate as overland flow paths during storm events. As identified above, the Bannockburn area is also typically dry with low rainfall however, there is the potential for storm events during construction.

It is proposed, by way of conditions of consent, that prior to works commencing a detailed Environmental Management Plan (**EMP**) will be prepared and submitted by the consent holder to the Otago Regional Council for approval. As part of the preparation of the EMP, the consent holder will develop and implement an Erosion and Sediment Control Plan (**ESCP**) in accordance with the Erosion and Sediment Control Guidelines for Land Disturbing Activities in the Auckland Region (GD2016/005) to avoid or minimise adverse effects associated with construction phase discharges of contaminants to land and water. The ESCP will be submitted to Council prior to works on competition of the detailed design drawings, or as otherwise required by conditions of consent.

The measures outlined in the ESCP will avoid or minimise erosion and the risk of sediment-laden discharges entering nearby sensitive receptors (namely watercourses and adjoining properties) and mitigate any other environmental issues that may arise during the construction works (e.g. dust nuisance, flooding, erosion, land instability or property damage).

The preliminary erosion and sediment plan is contained in **Attachment [F]** which identifies ‘compulsory erosion and silt fencing’ located adjacent to those gully and depression areas which will intercept any sediment entrained runoff, and adjacent to existing residential properties (near proposed lots 3-6). The preliminary erosion and sediment plan identifies optional/as required areas for erosion and silt fencing.

It is considered that post consent, but prior to works commencing the more detailed design of the EMP can confirm whether additional erosion and sediment control is necessary in these areas, or if greater intervention is required. Factors which may influence the necessity of the additional silt fence areas include:

- The time of year the works will be undertaken, including any delays to road sealing because of low winter temperatures;
- Greater detail of construction methods and timing for the works to be completed; and
- Location of soil stockpiles.
- Management of dust, including during weekends and holiday periods.

All disturbed areas within the site will be stabilised and/or revegetated upon completion of the earthworks to minimise erosion and sediment-laden discharges, and to avoid slope failure.

Earthworks can be managed so that the adverse effects on the environment are minor.

6.4.2 Natural Hazards and Site Stability

Engeo have undertaken a geotechnical assessment of the site with the report in **Attachment [D]**. The Engeo assessment has considered a range of potential hazards, including the feasibility for building on the steeper lots located within the BLR.

The site is considered to be suitable for the proposed development from a geotechnical perspective, with the findings of the assessment summarised as follows:

- The proposed lots along the southern boundary (Lots 15, 16, 17 and 19), occupy moderately sloping relief and have been assessed as development risk class 2. Development of those lots is unlikely to accelerate, worsen or result in material damage to the land, provided good engineering practice for hill slope development is applied. Shallow earthworks may be required to create a stable building platform as part of subdivision works.
- Proposed Lot 18 has been categorised as development risk class 3 due to its location on moderately sloping ground and ground cracking identified during site assessment. The source of ground cracking is likely due to creep of surficial soil overlying shallow bedrock up to 0.3 m depth. It is not clear that there is a significant risk from the geohazard identified, and this hazard will be able to be mitigated through a combination of good engineering practises for hill slope development and specific engineering mitigation design.
- The remaining lots not identified above have been assessed as development risk Class 1, these lots are not expected to be subject to significant risk from geohazards if standard development practices are adopted.

Conditions of consent are volunteered to ensure the recommendations of the Engeo report are observed and implemented as part of the subdivision development, and the registration of consent notice conditions (where necessary) on any lots in addition to Lot 18.

On the basis of the above there are no natural hazard impediments to the proposal.

6.5 Access and Transport

6.5.1 Terrace Street and Bannockburn Road

The potential effects on the wider road network, and the effects of the subdivision's layout in terms of access to each lot and sight distance and access gradient considerations are assessed in the Bartlett Consulting assessment in **Attachment [E]**.

The proposed subdivision will create 20 residential lots, the proposed development may generate up to 164 vehicles per day (vpd) including a peak hour traffic flow of up to 18 vehicles per hour (vph)[10].

The Bartlett Consulting report identifies that the existing Terrace Street / Bannockburn Road intersection formation is appropriate for the activity. The increased traffic volumes is unlikely to have adverse effects on traffic safety or efficiency.

Along the existing portion of Terrace Street, the roadside residential lots are relatively large which provides sufficient off-street parking and there is no identified, or observed, demand for onstreet car parking. This means that the existing road width is sufficient to accommodate both the current and proposed traffic flow.

The existing Terrace Street has no footpaths which means that pedestrians share the carriageway with vehicles. The existing street includes street lighting which means that pedestrians, and cyclists, who are required to share the carriageway will be visible at night.

6.5.2 Pedestrian Access

The Barlett Consulting report identifies that based on the CODC Addendum to its code of practice (NZS 4404:2004) Terrace Street would be expected to provide footpaths so that pedestrians are not required to share the road with vehicles. Given that the assessed operating speed is approximately 50km/hr it is recommended that a footpath is provided within the existing Terrace Street road corridor so that pedestrians are not required to share the carriageway with vehicles. It is recommended that the proposed development includes a single 1.5m footpath is recommended along the full length of the existing Terrace Street. Ideally, this footpath would be provided on the northern side and will include a footpath crossing over Bannockburn Road to allow pedestrians to access the existing footpath network on the western side of Bannockburn Road. This recommended footpath will improve overall pedestrian safety within Terrace Street and allow for increased traffic as a result of the proposed subdivision.

[10] Base on NZTA Research Report (RR453) Trips and Parking Related to Land Use, Table 7.4 Summary of design trips and parking demand in NZ in 2010. Dwelling (outer Suburban) 0.9vph/unit, 8.2vpd/unit. Calculations are based on 20 total residential dwellings, one per lot.

6.5.3 Vehicle Crossings

Driveway locations for each lot have been considered in order to best satisfy the sight distance requirements.

While not breaking the ODP rules, the gradients of the shared accesses from Lot 100 (loop road) will breach the maximum recommended gradients of the CODC Addendum to NZS 4404:2004[11]. Bartlett Consulting recommend that the gradient of these shared private access ROW, serving Lots 15/16, 17/18 & 19/20 be design in accordance with the current NZ Standards with the access surfacing amended to accommodate winter conditions in Central Otago, the final design of these shared access ROW may be considered through the engineering approvals process.

Vehicle crossings can be located and designed in accordance with the ODP although it is recommended that the location of some vehicle crossings are restricted, as recommended, for Lots 3, 4, 5 & 10 that access must be greater that 15m from the centre of the adjacent intersection to achieve desirable intersection separation distances.

As discussed above, the right of way for Lots 6, 19 and 20 will be located as shown on the subdivision plans, and that for landscape considerations, the earthworks associated with the access of Lot 6 onto that right of way is minimised to avoid visual effects.

Conditions of consent are proposed in Section 8 below.

On the basis of the above and the advice from Bartlett Consulting the subdivision can be undertaken with no more than minor adverse effects. The provision of a new footpath on the existing portion of Terrace Street is a positive effect on the environment.

6.6 Servicing

Servicing information is set out in detail in the description of the proposal above.

It is considered that there is sufficient capacity in the network, being a subdivision on residential zoned land which complies with the ODP's density standards. The engineering approval process will also ensure that the works are undertaken in accordance with the Council's design specifications.

Adverse effects on the Council's reticulated water and wastewater network will be minor.

6.7 Erosion and Sediment Management

The earthworks will be undertaken on an alluvial terrace that is considered to be relatively isolated from any nearby waterbodies, however, contains gullies and depressions which are likely to operate as overland flow paths during storm events. As

[11] NZS4404:2010 Land Development and Subdivision Infrastructure provides design standards for a Figure E1 road type (lane or private way) Section 3.3.16.1 part (a).

identified above, the Bannockburn area is also typically dry with low rainfall however, there is the potential for storm events during construction.

It is proposed, by way of conditions of consent, that prior to works commencing a detailed Environmental Management Plan (**EMP**) will be prepared and submitted by the consent holder to the ORC for approval as part of the separate resource consent process.

As described above the site does not contain any waterbodies however, contains gullies and depressions that are likely to operation as overland flow paths which drain into existing water courses Revell's Gully and Shepherds Creek which in turn drain into the Bannockburn Inlet. The preliminary erosion and sediment control plan in **Attachment [F]** identifies compulsory silt fence adjacent to Lot 20, near Shepherds Creek, and adjacent to Lots 7 and 8, and the access road where the depression/gully feature will provide drainage to Revell's Gully. It also identifies areas where optional / as required silt fences are to be located.

It is considered that adverse effects associated with earthworks in terms of erosion and sediment can be controlled so that they are not more than minor.

6.8 Overall Summary of Adverse Effects

The ODP describes the RRA(4) where it applies to Bannockburn, as an area is capable of accommodating low density residential development in a manner that provides privacy for the occupiers of dwelling houses and maintains the rural character of Bannockburn. An open form of development is promoted[12].

On the basis of the above assessment, and supporting technical reports in Attachments B to F, and coupled with the volunteered conditions of resource consent, which volunteer a more diminutive scale of development (outside the BLR) than provided for by the ODP, subdivision will integrate successfully into the environment, and the adverse effects of those buildings within the BLR can be appropriate mitigated.

The adverse effects on the environment will be minor.

6.9 Positive Effects

The activity provides for the formalisation and improvement of public access trails over the site which does not presently exist. The walking trails will provide recreational benefits to the existing Bannockburn community. Making the walking trails lawful, and more readily available for use will encourage better patronage and appreciation of the area.

The activity will also integrate archaeological sites and heritage values into the subdivision, and provide for their protection.

[12] ODP Policy 7.2.7 'Explanation'.

The reserve on Lot 30 will enable the public to enjoy views for this elevated site and also increase their knowledge and appreciation of the heritage values through interpretation panels.

The subdivision will also provide for a 1.5m footpath along the existing extent of Terrace Street, providing a safer pedestrian environment.

7 Statutory Assessment

7.1 Section 95 of the RMA

7.1.1 Section 95A Assessment

Section 95A of the RMA considers the need for public notification and sets out four steps in a specific order to be considered in determining whether to publicly notify.

In terms of Step (1), public notification is not requested, Section 95C pertaining to notification in the event that further information is not provided under Section 92 is not applicable, and the application is not being made jointly with an application to exchange recreation reserve land under Section 15AA of the Reserves Act 1977.

In terms of Step (2), the proposal does not fall within any of the matters for which public notification is precluded.

Moving to Step (3), notification is not required by a rule in a Plan or a NES, and as demonstrated in this report and the AEE (including volunteered conditions at Section 8) and supporting information, the adverse effects on the environment can be appropriately managed so that they are not likely to be more than minor.

Lastly, in terms of Step (4) as no special circumstances are considered to apply public notification is not required under any of the pathways in Section 95A.

7.1.2 Section 95B Assessment

Any effects of the proposal on the local environment and upon particular parties must still be considered. This is addressed through Section 95B of the RMA, which has four steps similar to Section 95A.

In terms of Step (1), there are no affected protected customary rights or customary marine title groups in terms of Subclause (2), nor is the proposed activity on or adjacent to, or may affect land that is the subject of a statutory acknowledgement made in accordance with an Act specified in Schedule 11 in terms of Subclause (3).

In terms of Step (2), none of the circumstances in Subsection (5) that would preclude limited notification apply.

Step (3) requires the consent authority to determine, in accordance with Section 95E, whether there are any affected parties. Section 95E states that a person is an affected person if the consent authority decides that the activity's adverse effects on the person are minor or more than minor (but are not less than minor).

For the reasons outlined above There are not considered to be any affected persons in this instance for the reasons given in the above assessment of effects.

Overall, any actual or potential adverse effects of the proposed development are considered to be less than minor.

In terms of Step (4), no special circumstances exist.

7.2 Consideration of Applications - Section 104 of the RMA

Section 104 (1) of the RMA requires that the consent authority must, subject to Part 2, have regard to a range of matters when considering an application.

Section 5 of this application addresses the matters contained in Section 104 (1) (a) and (ab). This section of the AEE considers those matters relevant under section 104 (1) (b), in particular any relevant provisions of a plan or proposed plan.

Section 104(1)(b) requires the consent authority to have regard to any relevant provisions of the following documents:

(i) a national environmental standard:

(ii) other regulations:

(iii) a national policy statement:

(iv) a New Zealand coastal policy statement:

(v) a regional policy statement or proposed regional policy statement:

(vi) a plan or proposed plan

The key relevant documents relevant document to have regard to the are the objectives and policies of the ODP, discussed below, then followed by the other relevant matters.

7.3 ODP Objectives and Policies

7.3.1 ODP Section 6 Urban Areas

The following District Wide objectives and policies are relevant to the subdivision:

6.3.1 Objective - Needs of People and Communities To promote the sustainable management of the urban areas in order to:
(a) Enable the people and communities of the district to provide for their social, economic and cultural wellbeing and their health and safety; and
(b) Meet the present and reasonably foreseeable needs of these people and communities

6.3.2 Objective - Amenity Values

To manage urban growth and development so as to promote the maintenance and enhancement of the environmental quality and amenity values of the particular environments found within the District's urban areas.

6.3.3 Objective - Adverse Effects on Natural and Physical Resources

To avoid, remedy or mitigate the adverse effects of urban areas on the natural and physical resources of the District.

6.4.1 Policy - Maintenance of Quality of Life within Urban Areas

To maintain and, where practicable, enhance the quality of life for people and communities within the District's urban areas through:
(a) Identifying and providing for a level of amenity which is acceptable to the community; and

(b) Avoiding, remedying or mitigating the adverse effects on the community's social, economic and cultural wellbeing and health and safety which may result from the use, development and protection of natural and physical resources, and
(c) Recognising that change is inevitable in the use of land to enable the community to provide for its wellbeing.

The activity is consistent with Policy 6.4.1 because it will provide for new urban development in a location which has been identified as appropriate for urban development through the ODP (and PC 19). Overall, the adverse effects associated with buildings in the BLR can be managed so that amenity is maintained, while the overall subdivision as viewed collectively will increase amenity values through the provision of an open space and trail network. Policy 6.4.1 relates to the management of the loss of amenity values in the urban environment. The RMM landscape assessment identifies that many of the viewpoints of those lots within the BLR are from outside the urban environment and relate to views from public places in the Rural Resource Area.

While there will be a loss of amenity associated with buildings within the BLR, the RMM landscape. and Kopuwai Consulting heritage assessments provide a high level of certainty as to the extent of effects of landscape, amenity and heritage values, and the addition of the reserve, trials and integration of heritage values will overall improve the quality of amenity in the environment.

Policy 6.4.1(c) acknowledges that change is inevitable as part of the use of urban land for a community to provide for its wellbeing. This activity will result in changes, but they are done so in a sympathetic manner while provide for greater wellbeing through the formalising of the use of the site by the public for a walking trail, the integration of heritage features and creation of a high amenity extension to Terrace Street.

The activity is consistent with the above objectives and policies.

7.3.2 ODP Section 7 Residential Resource Area

7.1.1 Objective - Maintenance of Residential Character

To manage urban growth and development to maintain and enhance the built character and amenity values of those parts of the district that have been identified as the Residential Resource Area as well as the social, economic and cultural wellbeing, and health and safety of the residents and communities within those areas.

7.1.2 Objective - Protection of Living Environment

To manage the use of land to promote a pleasant living environment by ensuring that adverse effects of activities are avoided, remedied or mitigated, while accommodating appropriate change at the interface with other resource areas.

7.1.3 Objective – Management of Change

To recognise that it is inevitable that the use of land shall change over the period of this plan and beyond in order to enable the community to provide for its wellbeing. The process of change can occur randomly within the various resource areas but will be most obvious at the interface between different resource areas. It is a purpose of this plan to manage that change.

7.2.1 Policy - Residential Character

To ensure that the character and amenity values of residential areas are protected by ensuring that the adverse effects of:

(a) Excessive noise including noise associated with traffic generation and night time operations,
(b) The generation of traffic over and above that normally associated with residential activities and in particular heavy vehicles, and demand for parking,
(c) Glare, particularly from building finish, and security lighting,
(d) Structures at the street frontages that do not complement the character and/or scale of development in the neighbourhood,
(e) A reduction in privacy, access to daylight and sunlight
(f) A reduction in visual amenity due to excessive signage, large areas of hard standing surfaces, and the storage of goods or waste products on the site,
(g) The generation of odour, dust, wastes and hazardous substances,
(h) The use and/or storage of hazardous goods or substances, and
(i) The loss of a sense of amenity, security and companionship caused by non-residential activities. are avoided, remedied or mitigated.

7.2.2 Policy - Amenity Values

To ensure that the amenity values of residential sites, including privacy and ability to access adequate daylight and sunlight, are not significantly compromised by the effects of adjoining development.

7.2.3 Policy – Environmental Quality

To preserve the environmental quality found within particular areas of the District's residential environment.

7.2.4 Policy - Recreation Activities

To provide for the wellbeing of the District's communities by requiring developments to recognise and provide for the recreational needs of the community.

7.2.5 Policy - Open Space

To maintain the amenity value of open space within the District's residential environments.

7.2.7 Policy - Residential Resource Areas (1) – (13)

To ensure that subdivision and development in the areas shown as Residential Resource Areas (1) – (13) complement the character and amenity of these areas and provide for the protection of significant landscape features, where such features are present.

The explanatory statement for this policy is, in relation to Bannockburn:

Within the Residential Resource Area specific areas have been identified where it is appropriate to apply different standards for subdivision allotment sizes, bulk and location or with respect to other effects of activities. In most instances the areas concerned have had specific planning provisions applied to them in the Transitional District Plan that recognise their particular characteristics. These characteristics are discussed below.

…

The area of land identified as Residential Resource Area (4) applies to Bannockburn, on the eastern side of Bannockburn Road and both sides of Hall Road west until just beyond Miners Terrace. The area is capable of accommodating low density residential development in a manner that provides privacy for the occupiers of dwelling houses

and maintains the rural character of Bannockburn. An open form of development is promoted.

The character of the built form resulting from the subdivision and development will be consistent with the existing residential character of adjacent development and Bannockburn township. While the rural outlook of adjacent properties will change, that change was inevitable because the land has been zoned for residential activity, and the adverse effects of locating buildings within the BLR has been carefully considered.

The site is unique in that although zoned for urban development, it contains heritage features which require management. The activity has sought to integrate these into the subdivision and protect those remaining heritage features which are worthy of protection. The activity has demonstrated that the quality of the environment will be preserved through the identification of the heritage and landscape constraints, and integration of those considerations into the proposal.

The mitigation measures, outlined in section 8 below will ensure that the qualities of the site and associated amenity values are overall maintained while providing for appropriate urban development. The activity will comprise an open form of development consistent with the ODP's intentions for the RRA(4) area and Terrace Street.

The activity will complement the existing amenity values of the Bannockburn township and the RRA(4) zoning, in particular through the careful consideration of the placement of buildings within the BLR, and the overall reduction in building height and building coverage throughout all residential lots within the subdivision. In this regard, in responding to the above policy framework, the proposal provides a more diminutive built form outcome than what is reasonably anticipated by the ODP's bulk and location standards for the RRA(4) zone.

The activity is consistent with the above objectives and policies.

7.3.3 ODP Section 12 District Wide

The objectives in Section 12 are on the safe and efficient roading network, noise, signs, nuisance activities, derelict buildings, temporary activities and transmission lines. BLR Rule 12.7.7 references Policy 12.4.1 which is on parking, loading and manoeuvring, and Rule 13.7.15(i) (Oxidation Ponds and Sewage Treatment Facilities).

There are not any relevant objectives or policies within Section 12 District wide which relate to the BLR on the application site.

The following transport related objectives and policies are relevant:

12.3.1 Objective - Safe and Efficient Roading Network

To promote the safe and efficient operation of the District's roading network

12.4.1 Policy - Parking, Loading and Manoeuvring

To avoid, remedy or mitigate adverse effects on the safe and efficient operation of the roading network by requiring:
(a) Safe and efficient access points to the roading network, and
(b) Off-road loading and manoeuvring space and facilities, and
(c) Off-street parking, where these are appropriate.

As described in the AEE above, and the Bartlett Consulting transport assessment the activity will maintain a safe and efficient roading network. Access to each lot can be provided in a way that achieves appropriate sight distance from intersecting roads, and at a suitable gradient.

For the reasons set out above the proposal is considered to achieve the objectives of the District plan and is not contrary to those objectives and policies.

7.3.4 ODP Section 14 Heritage Buildings, Places, Sites, Objects and Trees

14.3.4 Objective – Archaeological Sites

To recognise and provide appropriate protection for the values associated with the district's archaeological sites.

14.4.6 Policy – Archaeological Sites
To provide for the conservation of values associated with the district's archaeological sites by:

(a) Identifying such registered sites, on the planning maps.
(b) Ensuring that works carried out within or near such sites recognise and provide for their values where appropriate.
(c) Requiring an assessment of the values associated with any such sites as part of any subdivision or land use consent in circumstances where a significant adverse effect may result, and requiring protection where such values are considered to be significant.

Policy 14.4.7 manages historic sites, but only in the context of those sites already identified in the ODP plan maps and schedules, and therefore does not apply to the site.

The archaeological adverse effects and effects on heritage landscape values have been assessed in detail in the Kopuwai Consulting report (**Attachment [C]**), mitigation in the form of protection of areas and the adaptive reuse of the water races and fence posts, and use of interpretive panels.

The considered approach to the management of the archaeological sites, and the destruction of some areas coupled with the protection of areas is such that the values have been provided for and will, despite the modification be conserved. The level of protection balanced against the areas that will be modified or destroyed is appropriate, and the adaptive reuse is considered a level of protection which reduces the vulnerability of the water races to other development.

The activity is consistent with the relevant heritage policies, in particular Policy 14.4.6(c) which encourages the identification of archaeological sites at the time of subdivision, where these are not already identified in the ODP, and the protection of these where they are significant. The Kopuwai Consulting report has identified the archaeological items worthy of retention, and supports the adaption of these areas with

the reserve and open trail areas as part of the acknowledgment of the environment's goldmining and early European settler history.

7.3.5 ODP Section 16 Subdivision

The following objectives and policies of section 16 are relevant:

> *16.3.1 Objective - Adverse Effects on the Roading Network*
>
> *To ensure that subdivision avoids, remedies or mitigates adverse effects on the safe and efficient operation of the District's roading network.*

The activity is consistent with this objective, as noted above when considering Policy 12.4.1.

> *16.3.2 Objective - Services and Infrastructure*
>
> *To ensure that subdivisions provide all necessary services and infrastructure without adversely affecting the public interest and the ongoing viability of those services and infrastructure.*

A high level servicing configuration has been provided in the proposal description. The activity can be serviced by the existing water and wastewater network. The activity is consistent with this objective.

> *16.3.4 Objective - Amenity Values*
>
> *To ensure, where appropriate, that amenity values of the District created by the open space, landscape and natural character values, and areas of significant indigenous vegetation, significant habitat of statutorily managed sports fish and game are not adversely affected by subdivision.*

The landscape and heritage values of the site have been carefully considered as part of the design of the subdivision. The amenity values of the environment have been carefully considered and those values integrated into the design and mitigation measures of the proposal. The activity is consistent with this objective.

16.3.6 - Objective - Heritage Values

> *To ensure that subdivision does not facilitate development that may adversely affect heritage and cultural values including cultural values of importance to Kai Tahu ki Otago.*

The heritage values associated with early European settler goldmining and farming activity have been comprehensively assessed. The values are known and there is a management strategy in place to protect the important elements. The subdivision would not facilitate development that adversely affects heritage values. The activity is consistent with Objective 16.3.6.

16.3.8 Objective – Public Access

> *To ensure, where appropriate, that subdivision maintains and where appropriate enhances public access:*
> *(a) To and along the margins of the District's lakes and rivers.*
> *(b) To the District's reserves and areas of public open space.*
> *(c) To sites of heritage and cultural values. (d) To sites of cultural importance to Kai Tahu ki Otago.*

Currently there is no public access formally available, the site does not contain any easements for public access.

The activity will enhance public access opportunities by formalising the walking tracks on proposed lot 40, the roading network which will become publicly accessible areas, and the proposed reserve of Lot 30.

The track on Lot 40 provides practicable access to the Inlet, while acknowledging there is a property (Lot 2 DP 304454) located between Lot 40 and the Inlet. Notwithstanding that direct access to Inlet is not provided, the proposal tracks at least formalise this opportunity to gain access to the Inlet from Terrace Street over the majority of the distance and over the application site.

The activity will also enhance the existing pedestrian access along Terrace Street though the provision of new footpath.

The activity achieves Objective 16.3.8.

16.4.7 Policy - Subdivision Design

To require that the design of subdivision, where relevant to the intended use, provides for the following matters:

(a) Facilitates convenient, safe and efficient access to all allotments including pedestrian access where appropriate.
(b) Facilitates the safe and efficient provision and operation of services and infrastructure.
(c) Facilitates access to passive solar energy resources.
(d) Facilitates any foreseeable subsequent development or redevelopment including the economic provision of roading and network utility services.
(e) Facilitates adequate provision of, or contribution to, the open space, recreational and reserve needs of the community with physical links to existing reserve areas where this is practicable.
(f) Facilitates an appropriate level of access to heritage sites, natural features and water bodies where appropriate.
(g) Facilitates development which keeps earthworks to a minimum.
(h) Facilitates retention of the heritage values of a site or area.

The subdivision can be undertaken in a way that provides safe and convenient pedestrian and vehicle access, and can be implemented to ensure services and roading are installed in accordance with Council's standards via the subdivision process. The activity is not contrary to this objective.

As discussed above, the activity will enhance access to open space and recreational areas, while formalising access to heritage sites and the integration of the identified archaeological areas with the open space network. The heritage values will be subject to modification with some archaeological areas removed, but overall the heritage values will be retained.

The activity is consistent with the objectives and policies Section 16 Subdivision.

7.4 Plan Change 19

The relevant objectives and policies within the LLRZ which are relevant to an assessment of landscape and visual effects are:

Large Lot Residential Zone

LLRZ-O1 Purpose of the Large Lot Residential Zone

The Large Lot Residential Zone provides primarily for residential living opportunities.

LLRZ-O2 Character and amenity values of the Large Lot Residential Zone

The Large Lot Residential Zone is a pleasant, low-density living environment, which:

1. *contains predominantly low-rise and detached residential units on large lots;*
2. *maintains a predominance of open space over built form;*
3. *provides good quality on-site amenity and maintains the anticipated amenity values of adjacent sites; and*
4. *is well-designed and well-connected into the surrounding area.*

LLRZ-P1 Built Form

Ensure that development within the Large Lot Residential Zone:

1. *provides reasonable levels of privacy, outlook and adequate access to sunlight;*
2. *provides safe and appropriate access and on-site parking;*
3. *maintains a high level of spaciousness around buildings and a modest scale and intensity of built form that does not unreasonably dominate adjoining sites;*
4. *is managed so that relocated buildings are reinstated to an appropriate state of repair within a reasonable timeframe;*
5. *provides generous usable outdoor living space for residents and for tree and garden planting;*
6. *maintains the safe and efficient operation of road;*
7. *mitigates visual effects through screening of storage areas and provision of landscaping; and*
8. *encourages water efficiency measures.*

The proposed subdivision provides for a creative response to these constraints and the opportunity for the protection of the topographical and heritage features. It is considered an integrated subdivision proposal that is sympathetic to the landscape context.

The proposed mitigation, including the limitation of building coverage on all lots will ensure that there is a high level of spaciousness within the subdivision. The proposed landscape planting as identified in the RMM planting plan will be implemented as part of the subdivision development works and will assist with mitigating the visual effects of built form (where that built form within the BLR) and contribute overall to the subdivision integrating with the existing portion of Terrace Street and Bannockburn.

The activity is consistent with the notified PC19 LLR objectives and policies.

7.5 National Policy Statements

7.5.1 National Policy Statement Urban Development (NPS-UD)

The relevant national policy statement is the NPSUD 2020. The relevant provisions are identified and discussed as follows:

> *1.5 Implementation by tier 3 local authorities*
>
> *Tier 3 local authorities are strongly encouraged to do the things that tier 1 or 2 local authorities are obliged to do under Parts 2 and 3 of this National Policy Statement, adopting whatever modifications to the National Policy Statement are necessary or helpful to enable them to do so.*

Provision 1.5 of the NPSUD is not an objective or policy but an 'implementation direction' for Tier 3 local authorities.

Theme: Making room for growth

> *Objective 1: New Zealand has well-functioning urban environments that enable all people and communities to provide for their social, economic, and cultural wellbeing, and for their health and safety, now and into the future.*

> *Policy 1: Planning decisions contribute to well-functioning urban environments, which are urban environments that, as a minimum:*
> *(a) have or enable a variety of homes that:*
> *(i) meet the needs, in terms of type, price, and location, of different households; and*
> *(ii) enable Māori to express their cultural traditions and norms; and*
> *(b) have or enable a variety of sites that are suitable for different business sectors in terms of location and site size; and*
> *(c) have good accessibility for all people between housing, jobs, community services, natural spaces, and open spaces, including by way of public or active transport; and*
> *(d) support, and limit as much as possible adverse impacts on, the competitive operation of land and development markets; and*
> *(e) support reductions in greenhouse gas emissions; and*
> *(f) are resilient to the likely current and future effects of climate change.*

The activity would help the Council contribute to achieving Objective 1 and Policy 1 by increasing the variety of homes available within the Bannockburn, has good accessibility to Cromwell and recreational accessibility by virtue of the proposed trails.

Theme: Housing affordability

> *Objective 2: Planning decisions improve housing affordability by supporting competitive land and development markets.*

The activity can also contribute to housing affordability through increased housing supply and competition within the Bannockburn area.

Theme: Clarifying amenity and change in urban environments

> *Objective 4: New Zealand's urban environments, including their amenity values, develop and change over time in response to the diverse and changing needs of people, communities, and future generations.*

> *Policy 6: When making planning decisions that affect urban environments, decision-makers have particular regard to the following matters;*

(a) the planned urban built form anticipated by those RMA planning documents that have given effect to this NPS
(b) that the planned urban built form in those RMA planning documents may involve significant changes to an area, and that those changes:
(i) may detract from amenity values appreciated by some people but improve amenity values appreciated by other people, communities and future generations, including by providing increase and varied housing densities and types; and
(ii) are not, of themselves, an adverse effect
(c) the benefits of urban development that are consistent with well-functioning urban environments (as described in Policy 1)
(d) any relevant contribution that will be made to meeting the requirements of this NPS to provide or realise development capacity
(e) the likely current and future effects of climate change

Policy 6 recognises that within urban environments changes to the environment do not equate to adverse effects where the development accords with the opportunity for new housing and varied urban forms, and that urban development contributes to a well-functioning environment. The activity will accord with Policy 6 where it provides for housing on a residential zoned site and despite those changes the subdivision development has the ability for appreciation by a wider sector of the community through the reserve and public trails.

7.6 Regional Policy Statement

7.6.1 Partially Operative Otago Regional Policy Statement 2019

All PORPS provisions of relevance to this proposal are operative.[13] There is one objective and two policies which are relevant to the proposal in terms of urban development and are summarised below:

- Objective 4.5 – urban growth and development is well designed, occurs in a strategic and coordinated way, and integrates effectively with adjoining urban and rural environments;
- Policy 4.5.1 – that urban growth is provided for by the provision of sufficient capacity, and coordinating the extension of urban areas with infrastructure development programmes to provide infrastructure in an efficient and effective way; and
- Policy 4.5.2 – which requires the strategic integration of infrastructure, including through coordinating the design and development of infrastructure with land use change in growth and redevelopment planning.

The activity will provide for urban residential development in an appropriate location in terms of the spatial extent of urban growth in Bannockburn, which is reinforced through the urban LLR zoning of the Site in the context of PC19.

[13] Those provisions that remain the subject of court proceedings and that are not yet operative, are Policy 4.3.7, and Methods 3.1.6, 3.1.10, 3.1.18, 4.1.3, 4.1.22 and 5.1.2: https://www.orc.govt.nz/media/9658/rps_partially-operative_2019_2021.pdf

The activity is consistent with the PORPS.

7.7 Positive Effects to offset or compensate for any adverse effects (s104(1)(ab))

The provision of the reserve, waking trails and interpretation panels will provide positive effects associate with formalising active recreation, potential linkage from Bannockburn to the Inlet and for the general public to enhance their understanding and appreciation of the early settler goldmining and farming history of Bannockburn.

The application is founded upon a detailed understanding of the heritage values present, and the reuse and protection of those features will compensate not only for the destruction of those archaeological items supported as able to be modified in the Kopuwai Consulting report, but for the more extensive loss and apparent lack of consideration for heritage values which has occurred in previous subdivision developments. The activity appropriately compensates for adverse effects associated with the subdivision development itself, and previous modifications in the area undertaken as part of previous developments.

To the extent that the proposal creates adverse effects on the environment on visual amenity values through the location of buildings within the BLR, the above open space, heritage protection and recreation elements of the proposal provide compensatory measures.

7.8 Any other relevant matter (s104(c))

7.8.1 Precedent

The precedent resulting from granting a resource consent (in the sense of like cases being treated alike) is a relevant factor for a consent authority to take into account when considering applications for consent for non-complying activities. In this case, the activity is a restricted discretionary activity and precedent is not usually a relevant factor.

Notwithstanding, the context of this application relates to the BLR on the site, and the location and potential for additional development within the BLR area. The subdivision proposed would preclude opportunities for further subdivision and development within the BLR. Proposed reserve at Lot 30 adjoins the proposed road and should this lot be vested in Council, it would preclude the ability for additional subdivision of either Lot 30 or any additional subdivision eastwards of Lot 30.

Similarly, the subdivision does not readily facilitate future subdivision and development beyond (northwards) of proposed Lots 13 and 14. It is also the preference of the Applicant that Lot 40 be vested in Council, however on the basis that this is not supported as advised by Council officers in without prejudice pre-application discussions it will remain as a privately owned balance lot. The vesting of Lot 40 as reserve would avoid any further subdivision.

Lot 50 is a relatively large 7.51ha lot which will be retained for future development intended for the flat land near to Bannockburn Road. The topography of land and presence of archaeological items within the balance area of Lot 50 affected by the BRL makes this area unsuitable for residential building.

For these reasons the proposal does not set any feasible precedent for building within the remainder of the BLR on the Site.

The BLR itself is one of the larger BLRs in the District and encompasses the entirety of the Slaughter yard Hill area toward the Bannockburn Inlet. **Figure 12** below identifies the extent of the BLR. The BLR at Bannockburn does not presently contain any buildings but does contain roads, tracks and infrastructure including a CODC water reservoir.

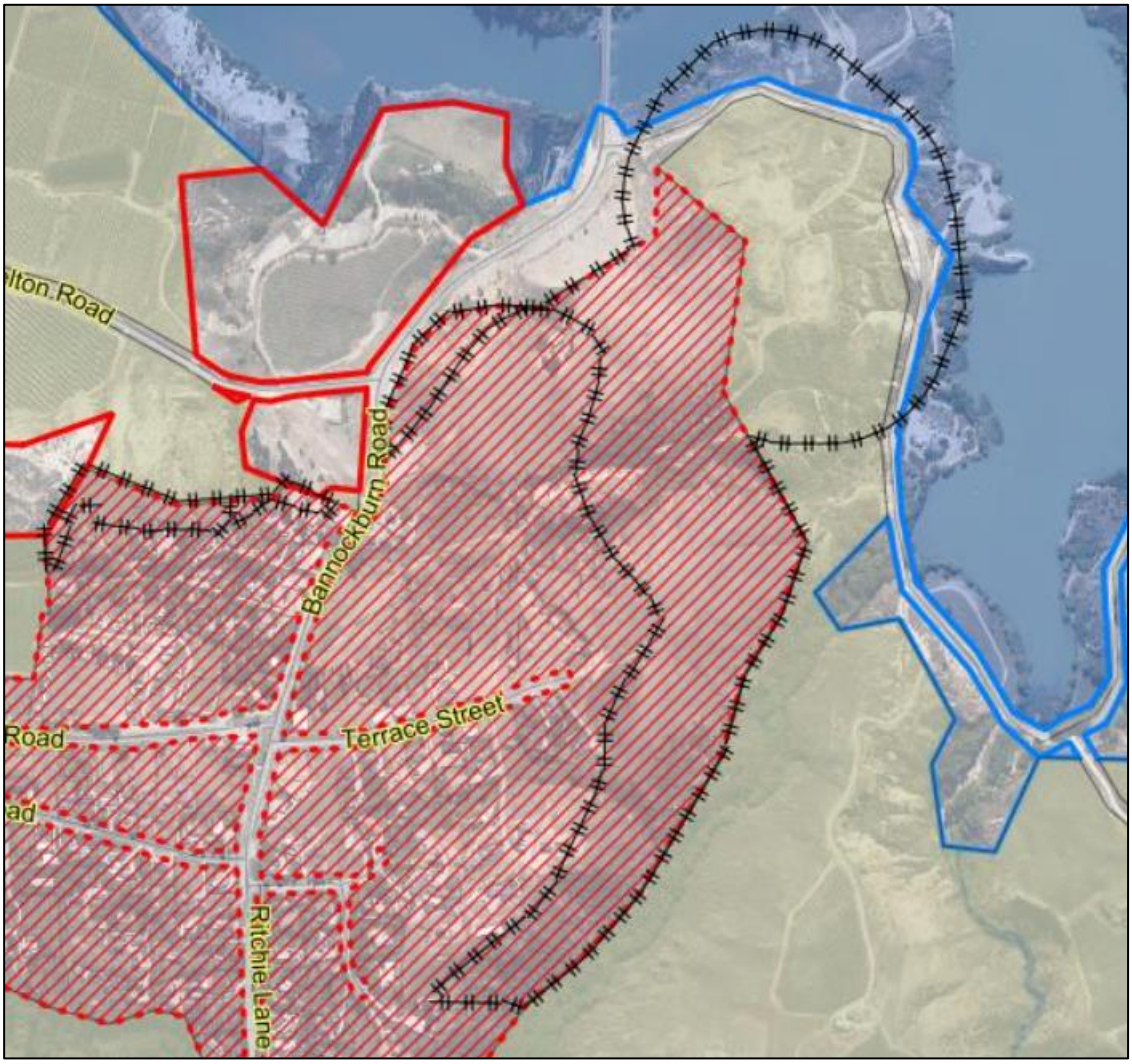


Figure 12. Simplified zoning plan identifying the BLR. Black line with cross hatching identifying the BLR at Bannockburn. A smaller BLR is located to west on the opposite side of Bannockburn Road.

With regard to precedent for buildings to be located within other BLRs within the District as identified on the ODP maps, the use of BLRs is highly varied and appear to be used for road setbacks to manage noise and vibration, and to protect infrastructure.

7.8.2 Plan Integrity

As is the case for precedent issues, restricted discretionary activities rarely call into question the integrity of the administration of the District Plan. To the extent relevant, The following specific aspects of the application are considered to negate the matter of plan integrity:

- The adverse effects of the proposal on amenity, neighbourhood character and distant views from the Bannockburn Inlet and surrounds have been assessed and have been identified as being appropriate.
- The activity is consistent with the relevant objectives and policies of the ODP.
- The activity is a restricted discretionary activity and not a non-complying activity. The ODP provides a resource consent pathway for buildings to be located within a BLR, subject the effects being assessed through the resource consent process.
- ODP Chapter 12 (District Wide) does not contain a directive policy or objective which seeks to avoid buildings within the BLR. There is no issue as to whether granting the activity would call into question the integrity of how the ODP is administered in terms of directive policies.
- For the reasons explained in the above discussion on precedent issues, the proposed subdivision will not readily facilitate further applications for subdivision which would result in buildings locating within the BLR.

7.9 Purpose and Principles of the RMA

The purpose of the RMA, as set out under Section 5 (2) is to promote the sustainable management of natural and physical resources. The relevant matters in Sections 6, 7 and 8 of the RMA also require consideration. The relevant Section 6 matters include:

(a) the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development:

(b) the protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development:

…

(e) the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga:

(f) the protection of historic heritage from inappropriate subdivision, use, and development:

…

The natural character values of the inlet will appropriately protected, and the historic heritage values on the site will be protected.

In the context of Section 6 of the RMA, the activity represents appropriate subdivision, use and development.

The RMA specifies that particular regard shall be had to the relevant other matters listed in Section 7 including:

(a) kaitiakitanga:

(aa) the ethic of stewardship:

(b) the efficient use and development of natural and physical resources:

….

(c) the maintenance and enhancement of amenity values:

(d) intrinsic values of ecosystems:

…

(f) maintenance and enhancement of the quality of the environment:

…

(h) the protection of the habitat of trout and salmon:

…

The activity will represent the efficient use of the site, while appropriately managing the adverse effects of buildings within the BLR. The quality of the environment will be enhanced through a carefully considered subdivision and development.

For the reasons outlined in this application, the proposal is consistent with the purpose and principles and the associated matters under Part 2 of the RMA. The proposal represents an efficient use of natural and physical resources, and will be undertaken in a manner which avoids, remedies and mitigates potential adverse effects on the environment. It is considered that the proposal is consistent with the purpose and principles of the RMA.

8 Volunteered Conditions

8.1 Landscape

1. On Lots 4,5,13,14, 15 – 20, Building platform of 500 m² shall be identified with all buildings and associated curtilage restricted to locate within the building platforms. No built development shall be permitted outside the building platform, such as clothes lines, swimming pools or other activities generally associated with a curtilage area.
2. For all of Lots 1-20, a maximum built coverage of 300m². Should any dwellings be two storeys, the maximum footprint for the ground floor will be 200m².
3. The access to Lot 6 shall be designed to limit the extent of earthworks required, and as far as practicable off the ridgeline.
4. Exterior cladding shall be limited to timber (vertical or horizontal), schist, or corrugated iron in one of the following Colorsteel colours: Lichen, Sandstone Grey, Lignite, Ironsand, FlaxPod, Grey Friars, New Denim Blue.
5. Roofing shall be constructed of corrugated iron in one of the of the following Colorsteel colours (or similar with a light reflectance value (LRV) of the less than 12%): Lignite, Ironsand, FlaxPod, Grey Friars, New Denim Blue.
6. Fencing at lot boundaries shall be limited to 1.2 m high unpainted post and rail, post and wire or waratah and wire fencing. The addition of rabbit wire mesh is encouraged.
7. Subdivision roading shall be asphalt or chip seal and have no kerb and channel.
8. Shared paths within the recreation reserve and road reserve shall be local compacted gravel and/or schist stone.
9. Planting for the road reserve, recreation reserve and private lots shall be undertaken in accordance with the planting palette in Appendix A.
10. Lot 30, planting shall be undertaken to provide visual screening of the built form on lots 5, 10-14 from viewpoints east of the site. Planting shall comprise.
    I. Mitigation planting will consist of 40% *Kunzea serotina*, 40% *Leptospermum scoparium*, and 20% *Coprosma propinqua*.
    II. Plants will be supplied at PB3 size or larger, and planted at a spacing of 3m centres to achieve sufficient coverage.
    III. All plants shall have a slow-release fertiliser, wool mulch collar, and plant guard installed to deter rabbit and hare browsing.

IV. A temporary irrigation system shall be installed and operation for the first three years from the date of planting to ensure quick and healthy establishment of plants.

V. All planting shall have been installed and healthy for a period of no less than three months from the date of planting prior to Council certification inspection.

11. Planting shall be undertaken in accordance with the heritage assessment recommendations, and shall be in general accordance with the RMM plan in Attachment [A] titled Master Plan – 20 Lot Option Lot 4 DP 339137, Terrace Street' dated 11/07/2023'.

12. Lots 1- 20 Buildings shall be subject to the following heights:

Maximum Building Height & Roof Elevation

Lot Number(s)	Maximum Building Height	Maximum Roof Elevation	Notes
1, 2, 3	5m	269 masl	
4, 6	4.2m	269.2 masl	
5	4.2m	270.2 masl	
7, 8, 9	7.5m	269 masl	
10	5m	269.5 masl	
11, 12, 13, 14	4.2m	271 masl	Buildings to be stepped with grade
15, 16, 17, 18, 19	5m	265 masl	Buildings to be stepped with grade
20	5m	266 masl	Buildings to be stepped with grade

8.2 Transport and Access

13. Lots 3, 4, 5 & 10, the vehicle access must be a minimum of 15m from the centre of the adjacent intersection to achieve desirable intersection separation distances.

14. A single 1.5m footpath shall be installed along the full length of the existing Terrace Street. Ideally, this footpath will be located on the northern side of the street and will include a footpath crossing over Bannockburn Road to allow pedestrians to access the existing footpath network on the western side of Bannockburn Road.

15. The access to Lots 6, 19 and 20 shall be via a right of way, and the right of way shall intersect with the Loop Road (Lot 100) from the locations generally shown on the plan of subdivision..

8.3 Geotechnical

16. The subdivision development design and implementation shall observe the recommendations of the Engeo geotechnical report titled Geotechnical Investigation - Lot 4 Water Race Hill, Bannockburn including but not limited to the following:

    I. Appropriate foundation bearing capacity is achieved for all lots.

    II. At Lots 1 and 9, foundation construction shall be set back from the crest at a horizontal distance at least twice the adjacent vertical slope height

    Where applicable, the recommendations shall be included as consent notice conditions on the relevant lots.

8.4 Archaeological

Lot	Archaeological protection notation RC2 01 REV C	Proposed modification (Summarised from Figure 9 of Attachment [C] Page 60).	Resource Consent Response and Recommendations
1	Retain & protect (blue)shallow sluicing's water race & sluice face (yellow)	Lot 50 incorporates and protect west facing terrace sluice face off Lot 1 & pedestal mining claim boundary marker 2. Apply for authority to modify/destroy water race (red) & retain(blue) water race.	Consent Notice condition identifying and protecting water race and sluice face. No earthworks, hard landscaping features or structures allowed to be built over these areas.
2	No above ground features identified for formal protection	Apply for archaeological authority to destroy portions marked (red) on plan	No ongoing protection volunteered although new lot owners may elect to retain portions and integrate as part of the site development.
3	No above ground features identified for formal protection	No areas identified for modification	No specific controls proposed.
4	No above ground features identified for formal protection	Apply for archaeological authority to destroy portions marked (red) on plan. (F41/369 Upper water race)	No ongoing protection volunteered although new lot owners may elect to retain portions and integrate as part of the site development.
5	No above ground features identified for formal protection	No areas identified for modification	No specific controls proposed.
6	No above ground features identified for	Apply for archaeological authority to destroy portions marked (red) on plan.	No ongoing protection volunteered although new lot owners may elect to retain portions and integrate as part of the site development.

Lot	Archaeological protection notation RC2 01 REV C	Proposed modification (Summarised from Figure 9 of Attachment [C] Page 60).	Resource Consent Response and Recommendations
	formal protection	(F41/369 Upper water race)	
7	No above ground features identified for formal protection	No areas identified for modification	No specific controls proposed.
8	No above ground features identified for formal protection	Apply for archaeological authority to remove section of hardwood post & wire fence line & repurpose hardwood posts	To be implemented as part of the subdivision development works. Any surplus posts retained for use in community projects or other walkways on site, however not specific consent notice conditions are proposed.
9	retain & protect (blue) shallow sluicing's water race bordering Pennyweight sluicing F41/368 Lot 51 (excepting branch (red)) in Lot 9	Apply for authority to modify/destroy (red) branch water race Lot 9 (supplied from F41/369 Upper water race) Apply for archaeological authority to remove section of hardwood post & wire fence line & repurpose hardwood posts	Sluice gulch: Consent Notice condition identifying and protecting water race and sluice face. No earthworks, hard landscaping features or structures allowed to be built over these areas. Water race: No ongoing protection volunteered although new lot owners may elect to retain portions and integrate as part of the site development. Fence Posts: To be implemented as part of the subdivision development works. Any surplus posts retained for use in community projects or other walkways on site, however not specific consent notice conditions are proposed.
10	No above ground features identified for formal protection	No areas identified for modification	No specific controls proposed.

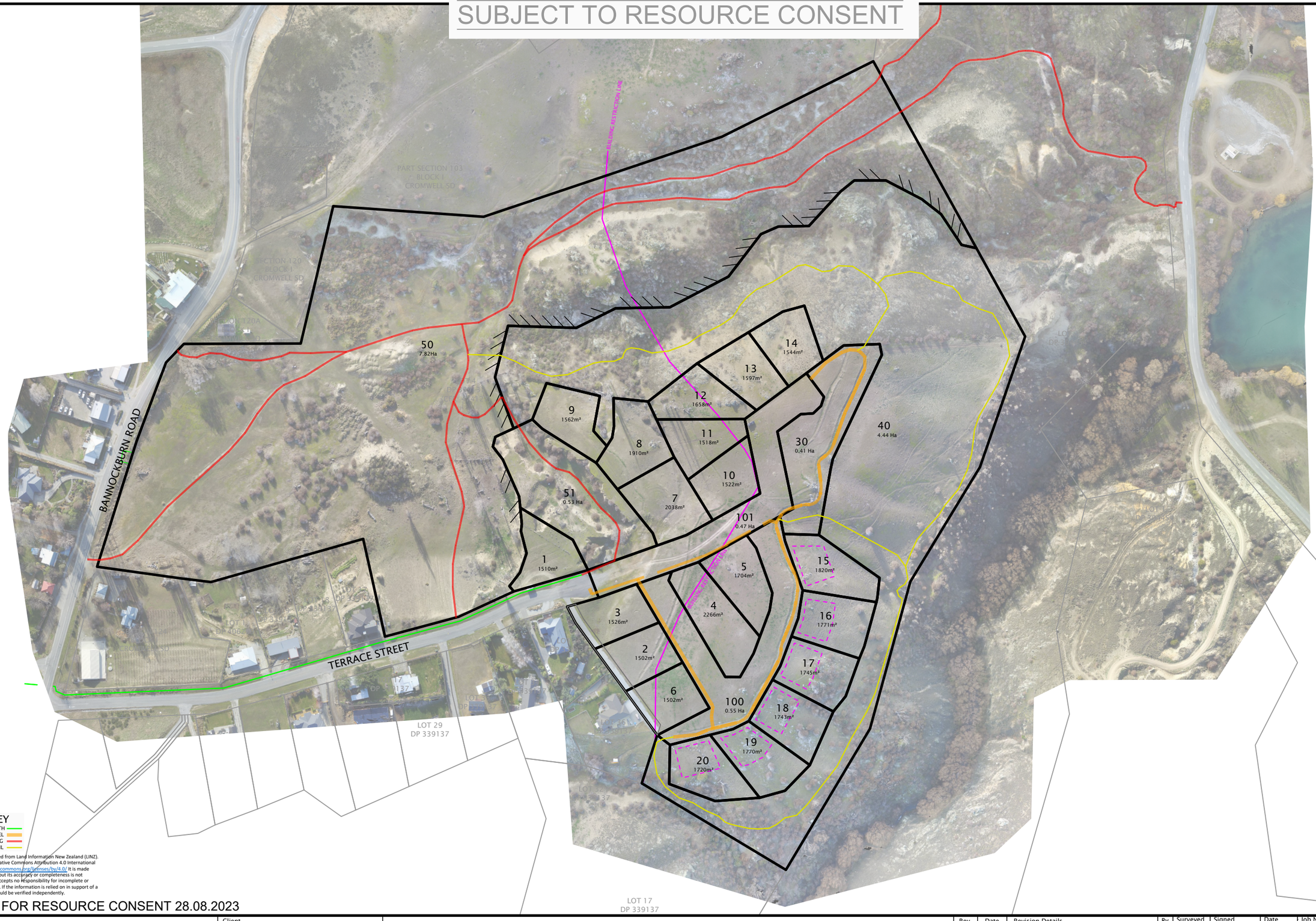
Lot	Archaeological protection notation RC2 01 REV C	Proposed modification (Summarised from Figure 9 of Attachment [C] Page 60).	Resource Consent Response and Recommendations
11	No above ground features identified for formal protection	Apply for archaeological authority to remove section of hardwood post & wire fence line & repurpose hardwood posts	To be implemented as part of the subdivision development works. Any surplus posts retained for use in community projects or other walkways on site, however not specific consent notice conditions are proposed.
12	No above ground features identified for formal protection	Apply for archaeological authority to remove section of hardwood post & wire fence line & repurpose hardwood posts	To be implemented as part of the subdivision development works. Any surplus posts retained for use in community projects or other walkways on site, however not specific consent notice conditions are proposed.
13	No above ground features identified for formal protection	No areas identified for modification	No specific controls proposed.
14	No above ground features identified for formal protection	No areas identified for modification	No specific controls proposed.
15	No above ground features identified for formal protection	No areas identified for modification	No specific controls proposed.
16, 17, 18 & 19	No above ground features identified for formal protection	Apply for authority to modify/destroy (red) sections of branch water race that traverses the lots.	No ongoing protection volunteered although new lot owners may elect to retain portions and integrate as part of the site development.

Lot	Archaeological protection notation RC2 01 REV C	Proposed modification (Summarised from Figure 9 of Attachment [C] Page 60).	Resource Consent Response and Recommendations
20		Apply for archaeological authority to remove section of hardwood post & wire fence line & repurpose hardwood posts. Apply for authority to modify/destroy (red) sections of branch water race that also traverse Lots 16, 17, 18 & 19.	**Fence Posts:** To be implemented as part of the subdivision development works with conditions of consent to manage heritage values. Any surplus posts retained for use in community projects or other walkways on site, however not specific consent notice conditions are proposed. **Water race (recorded historic site F41/372 Shepherds Ck water race):** Adaptive reuse as part of walking track to be implemented as part of the subdivision development works. **Water Race (south eastern area):** No ongoing protection volunteered although new lot owners may elect to retain portions and integrate as part of the site development.
30	Upper water race Lower water race.	Apply for archaeological authority to modify/disturb portions marked (blue) on plan traversing lots 30. (F41/369 Upper water race) Apply for archaeological authority for adaptive reuse 267m of lower water race as footpath and destruction of 3 sections for roadway/driveways and 2 sections for pathways & single track crossings totalling 10m (F41/369 linked lower water race)	To be implemented as part of the subdivision development works with conditions of consent to manage heritage values. Lot 30 is sought to be vested in Council as reserve. Consent notice conditions for ongoing management of archaeological features not required.

Lot	Archaeological protection notation RC2 01 REV C	Proposed modification (Summarised from Figure 9 of Attachment [C] Page 60).	Resource Consent Response and Recommendations
40	Within Lot 40 preserve lower remnants sluicing's Penny weights & others; water race remnants; hand revetted stacked wall sections; hardwood post and wire fence line remnants x 2; hand stacked tailings.	Apply for an archaeological authority to adaptively reuse the water race as public walking track within Lot 40.	Any necessary modification undertaken as part of the subdivision development works and subject to conditions to manage heritage values. Consent Notice Condition alerting to presence of archaeological items. Easement in gross public access.
50)	Archaeological items	Lot 50 incorporates and protect west facing terrace sluice face off Lot 1 & pedestal mining claim boundary marker 2. Include archaeological protection rule in Lot 50 to protect these features. (F41/385 Revell's Gully Sluicing's)	Any necessary modification undertaken as part of the subdivision development works and subject to conditions to manage heritage values. Consent Notice Condition alerting to presence of archaeological items and their ongoing protection. Easement in gross public access.
51	Retain & protect (blue) shallow sluicing's water race bordering Pennyweight sluicing & the sluicing's F41/368 (excepting branch (red) in Lot 9)	Apply for authority to modify/destroy (red) branch water race Lot 9 (supplied from F41/369 Upper water race)	Any necessary modification undertaken as part of the subdivision development works and subject to conditions to manage heritage values. Consent Notice Condition alerting to presence of archaeological items. Easement in gross public access.

Lot	Archaeological protection notation RC2 01 REV C	Proposed modification (Summarised from Figure 9 of Attachment [C] Page 60).	Resource Consent Response and Recommendations
100		Apply for archaeological authority to destroy portions marked (red) on plan traversing road reserve. (F41/369 Upper water race) Apply for archaeological authority for adaptive reuse 267m of lower water race as footpath and destruction of 3 sections for road way/driveways and 2 for pathways & single track crossings totalling 50m (F41/369 linked lower water race)	To be implemented as part of the subdivision development works, with conditions of consent to manage heritage values. Land will be vested in Council as road.
101		Apply for archaeological authority to destroy portions marked (red) on plan traversing road reserve and lots 6, 2, 4,100 & 101. (F41/369 Upper water race) Apply for archaeological authority to remove section of hardwood post & wire fence line & repurpose hardwood posts	To be implemented as part of the subdivision development works, with conditions of consent to manage heritage values. Land will be vested in Council as road.

SUBJECT TO RESOURCE CONSENT



TRACK KEY
- ASPHALT FOOTPATH
- NZCT G 1/2 GRAVEL
- INFORMAL EXISTING
- SINGLETRACK TRAIL

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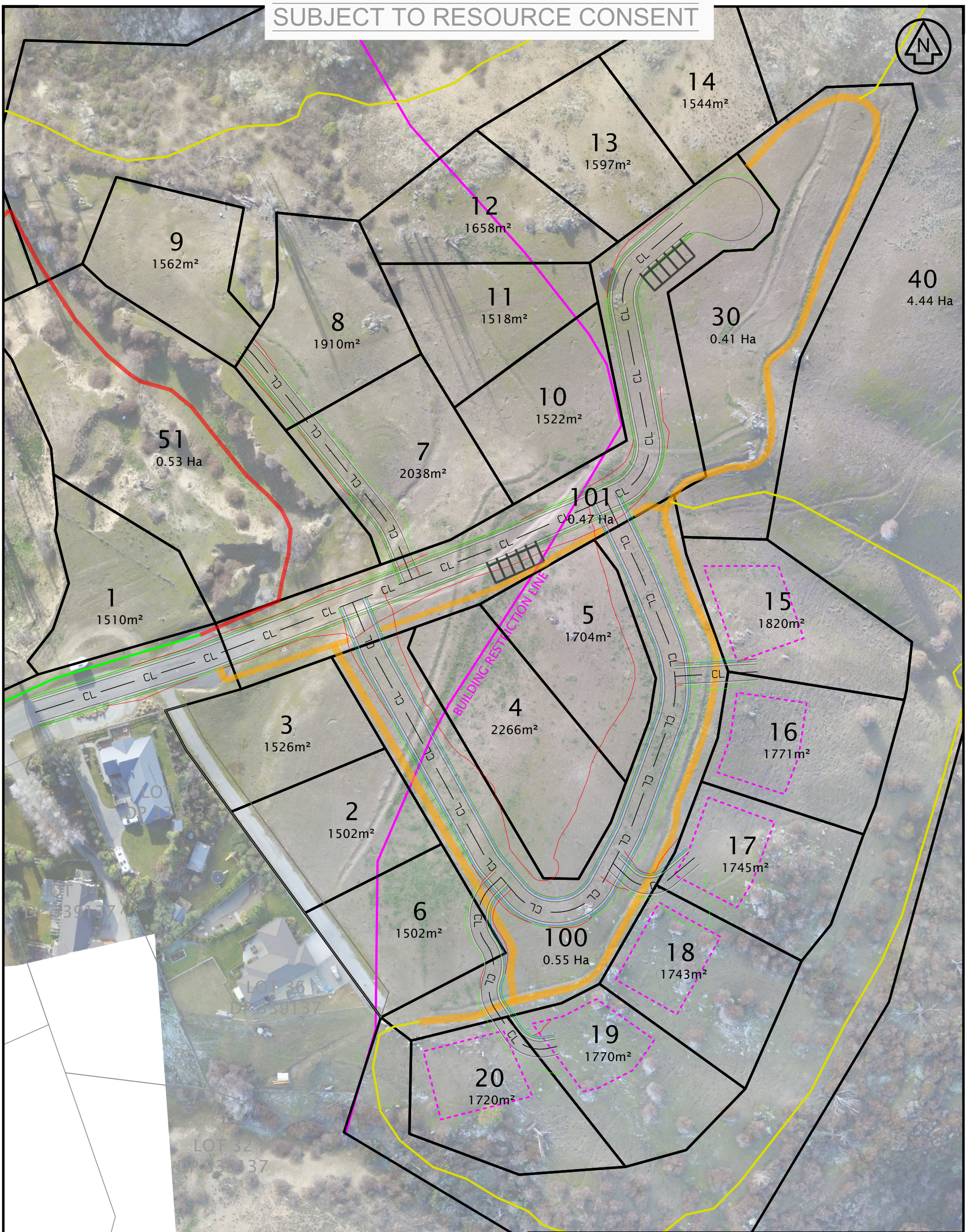
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OVERVIEW: LOTS 1 - 20, 30, 40, 50, 51, 100 & 101 BEING PROPOSED SUBDIVISION OF LOT 4 DP 339137 TERRACE STREET, BANNOCKBURN

Rev.	Date	Revision Details	By
A	16.11.22	ADD BLR	RAF
B	11.04.23	LOT 200 SPLIT INTO LOTS 30, 40 & 51	RAF
C	25.08.23	ISSUE FOR CONSENT APPLICATION	RAF

Surveyed	Signed	Date	Job No.	Drawing No.	
DRONE		SEP 16	S15303	RC2_01	
Drawn	Signed	Date	Scale	1:1,250 @ A1	
RAF		19.07.22		1:2500 @ A3	
Designed	Signed	Date	Datum & Level	Rev.	
RAF		12.07.22	NZTM 2000 & MSL	C	

SUBJECT TO RESOURCE CONSENT



ISSUED FOR RESOURCE CONSENT 28.08.2023

Rev.	Date	Revision Details	By
A	16.11.22	ADD BLR	RAF
B	11.04.23	LOT 200 SPLIT INTO LOTS 30, 40 & 51	RAF

Surveyed	Signed	Date	Job No.	Drawing No.	
DRONE		SEP 16	S15303	RC2_02	
Drawn	Signed	Date	Scale		
RAF		05.05.22	1:1,000 @ A3		
Designed	Signed	Date	Datum & Level	Rev.	
RAF		25.03.22	NZTM 2000 & MSL	B	

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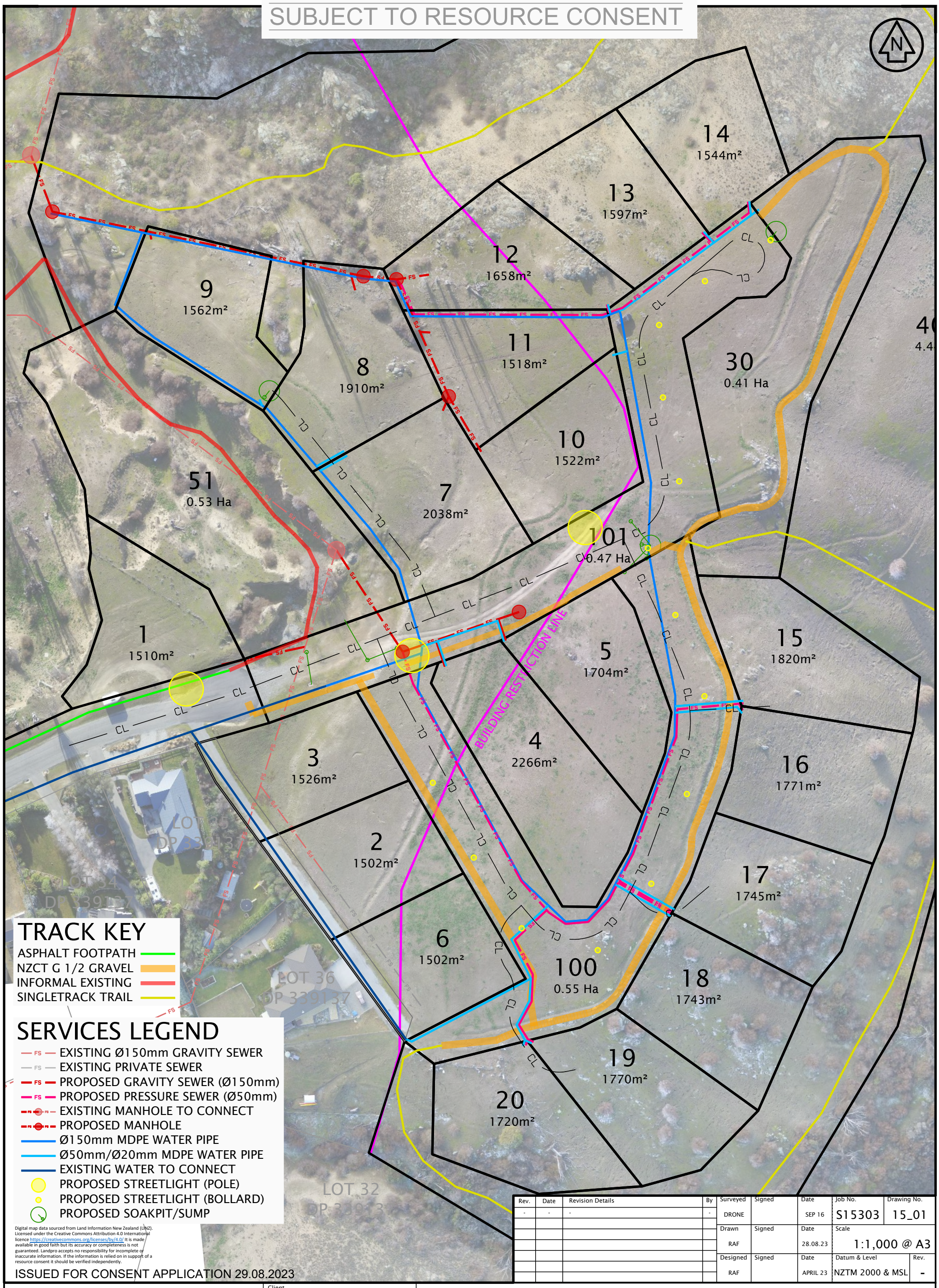
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RESIDENTIAL LOTS: LOTS 1 - 20, 30, 40, 50, 51, 100 & 101
BEING PROPOSED SUBDIVISION OF LOT 4 DP 339137
TERRACE STREET, BANNOCKBURN

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SUBJECT TO RESOURCE CONSENT



TRACK KEY

- ASPHALT FOOTPATH
- NZCT G 1/2 GRAVEL
- INFORMAL EXISTING
- SINGLETRACK TRAIL

SERVICES LEGEND

- EXISTING Ø150mm GRAVITY SEWER
- EXISTING PRIVATE SEWER
- PROPOSED GRAVITY SEWER (Ø150mm)
- PROPOSED PRESSURE SEWER (Ø50mm)
- EXISTING MANHOLE TO CONNECT
- PROPOSED MANHOLE
- Ø150mm MDPE WATER PIPE
- Ø50mm/Ø20mm MDPE WATER PIPE
- EXISTING WATER TO CONNECT
- PROPOSED STREETLIGHT (POLE)
- PROPOSED STREETLIGHT (BOLLARD)
- PROPOSED SOAKPIT/SUMP

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ISSUED FOR CONSENT APPLICATION 29.08.2023

Rev.	Date	Revision Details	By
-	-	-	-

Surveyed	Signed	Date	Job No.	Drawing No.	
DRONE		SEP 16	S15303	15_01	
Drawn	Signed	Date	Scale		
RAF		28.08.23	1:1,000 @ A3		
Designed	Signed	Date	Datum & Level	Rev.	
RAF		APRIL 23	NZTM 2000 & MSL	-	

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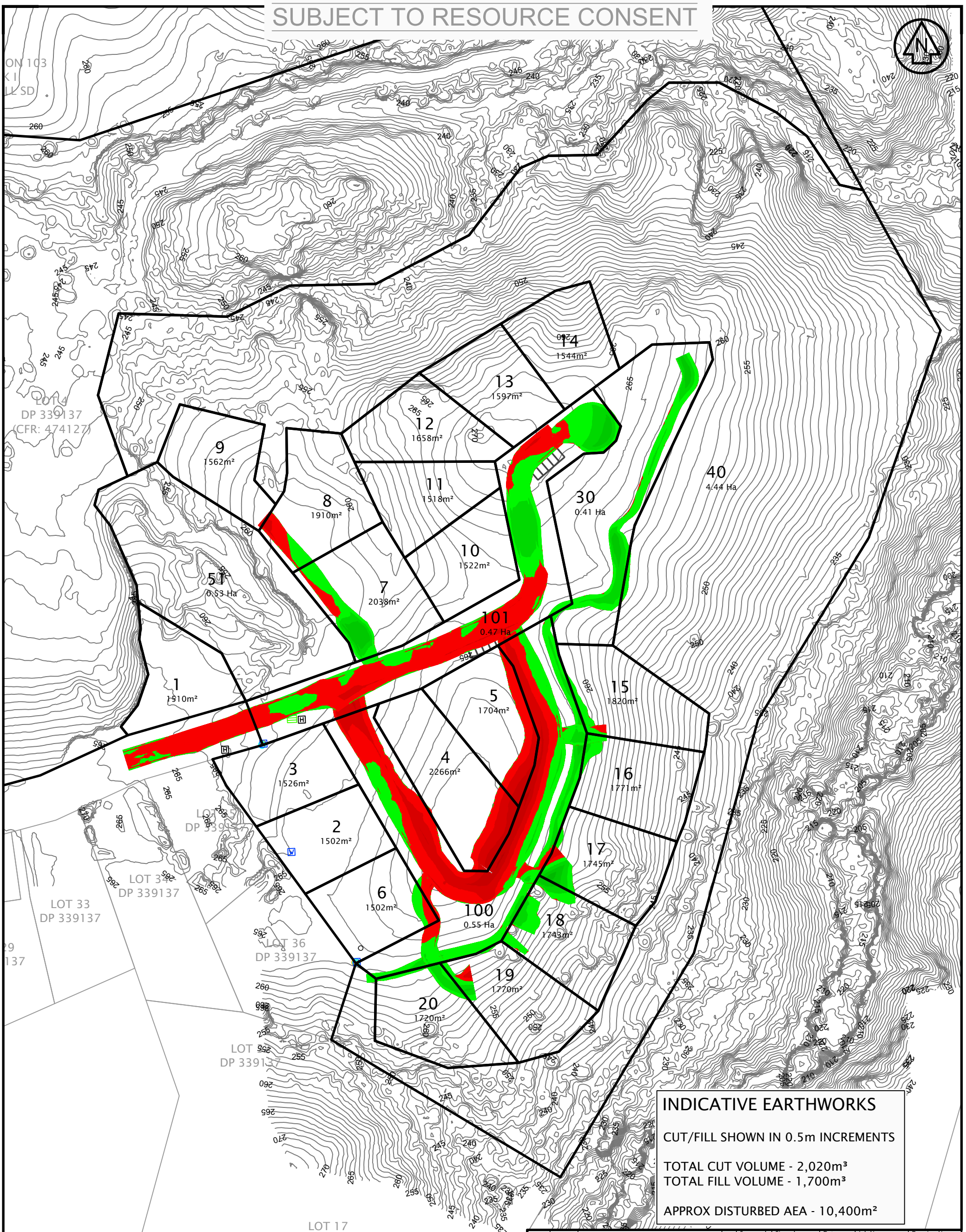
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PRELIMINARY ENGINEERING LAYOUT
PROPOSED SUBDIVISION OF LOT 4 DP 339137
TERRACE STREET, BANNOCKBURN

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SUBJECT TO RESOURCE CONSENT



INDICATIVE EARTHWORKS

CUT/FILL SHOWN IN 0.5m INCREMENTS

TOTAL CUT VOLUME - 2,020m³
TOTAL FILL VOLUME - 1,700m³

APPROX DISTURBED AEA - 10,400m²

Rev.	Date	Revision Details	By
A	25.08.23	UPDATE EARTHWORKS FOR REVISED LOTS	RAF

Surveyed	Signed	Date	Job No.	Drawing No.	
DRONE		SEP 16	S15303	12_01c	
Drawn	Signed	Date	Scale		
RAF		14.02.22	1:1,500 @ A3		
Designed	Signed	Date	Datum & Level	Rev.	
R & M		NOV '21	NZTM 2000 & MSL	A	

ISSUED FOR EROSION & SEDIMENT CONTOL PLANNING 28.08.2023

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INDICATIVE EARTHWORKS PLAN
PROPOSED SUBDIVISION OF LOT 4 DP 339137
TERRACE STREET, BANNOCKBURN

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RMM

ROUGH MILNE MITCHELL
LANDSCAPE ARCHITECTS

rmmla.co.nz

Landscape Assessment Report

Proposed Subdivision Water Race Hill, Terrace Street, Bannockburn



19 December 2023

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Date: 19 December 2023
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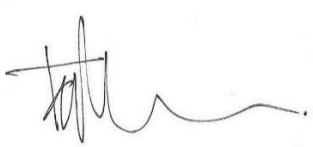
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1.0 Introduction

1.1 Purpose and Scope

Rough Milne Mitchell Landscape Architects (**RMM**) have been engaged by the Jones Family Trust (**the Applicant**) to assess the actual and potential landscape and visual effects of a proposed subdivision and public reserve located at Lot 4 DP339137, Water Race Hill, Terrace Street, Bannockburn.

The Applicant has previously submitted a resource consent application for subdivision of the site, RC190154 which is understood to be withdrawn upon lodgement of the current application. RMM working with Kopuwai Consulting, Landpro, Townplanning Group and ENGEO have prepared a revised subdivision layout. This landscape assessment report (**LVA Report**) considers the landscape and visual effects of the revised 20 lot subdivision and master plan.

1.2 Methodology

The methodology and terminology used in this report has been informed by the Te Tangi a te Manu: Aotearoa New Zealand Landscape Assessment Guidelines. [1]

This report is tailored to suit the nature of the project and its context including the framework of the governing legislation.

The statutory documents containing provisions relevant to the proposal are found in the Resource Management Act (**RMA**) and the Central Otago District Council (**CODC**) Operative District Plan (**ODP**). The ODP gives effect to the RMA within the context of Central Otago, as such, it provides the policy framework against which this landscape assessment has been evaluated.

Site visits were undertaken in July, August, and October 2020 as well as July and November 2021 to assist in understanding the landscape character and values of the site and the receiving environment and assess the proposal's actual and potential landscape effects. A number of surrounding public locations were visited during these site visits to identify the visual catchment for the site and assess potential visual effects.

Visual simulations had been previously prepared from three salient viewpoints of indicative development resulting from the original proposed subdivision to test visibility and potential effects. These simulations helped informed the current proposed subdivision.

In preparing this landscape assessment, the Heritage Impact Assessment[2] prepared by Kopuwai Consulting and Geotechnical Report[3] prepared by ENGEO, and the Landpro Subdivision package of drawings have also been considered.

The assessment is formatted as per the following:

- A description of the proposal.
- Description of receiving environment and the site.

[1] 'Te Tangi a te Manu: Aotearoa New Zealand Landscape Assessment Guidelines'. Tuia Pita Ora New Zealand Institute of Landscape Architects, July 2022.
[2] 'Heritage Impact Assessment for Water Race Hill Subdivision'. December 2023 Kopuwai Consulting.
[3] 'Draft Geotechnical Report'. Lot 4 Water Race Hill, Bannockburn Project No. 19377.000.001. 2/12/2021. ENGEO.

- Identification of existing landscape and visual amenity values.
- Relevant statutory provisions. The statutory provisions are found within the District Plan. Those provisions directly relevant to landscape and visual matters are set out in the District Plan and form the framework for the assessment.
- An assessment of landscape and visual effects.
- An assessment against the relevant statutory provisions, including the Plan Change 19 provisions.
- Conclusion.

This report is accompanied by a Graphic Attachment (**GA**), that contains maps and aerial images of the site location, the relevant District Plan planning maps, plans of the proposed subdivision, zone of theoretical visibility (**ZTV**) analysis undertaken as a desktop visibility study from key public viewpoints, and photographs of the site taken from key public viewpoints.

The table included in Figure 2 outlines the rating scales that are referred to in this report. The table included in Figure 3 is a comparative scale for the RMA s95 notification determination test and the RMA s104D 'gateway' test for non-complying activities.

Table 1: The seven-point landscape and visual effects rating scale [4]

Very Low	Low	Low - Moderate	Moderate	Moderate - High	High	Very High

Table 2: The comparative scale of degree of effects [5]

Very Low	Low	Low - Moderate	Moderate	Moderate - High	High	Very High
Less than Minor	Minor		More than Minor		Significant	

[4] 'Te Tangi a te Manu: Aotearoa New Zealand Landscape Assessment Guidelines'. [Final Draft subject to final editing, graphic design, illustrations, approved by Tuia Pito Ora/NZILA 5 May 2021]. Page 64.
[5] 'Te Tangi a te Manu: Aotearoa New Zealand Landscape Assessment Guidelines'. [Final Draft subject to final editing, graphic design, illustrations, approved by Tuia Pito Ora/NZILA 5 May 2021]. Page 68.

2.0 The Proposal

2.1 Original Proposal and Resource Consent Application

The original proposal entailed a subdivision of 38 residential lots which constituted a significant breach of the BLR and both the minimum and average lot sizes that apply to the RRA (4) zone. Prior to the application's submission to Council RMM made a number of recommendations which were included in the application RC190154, this included a reduced number of residential lots (35) and a suite of design controls including building height limits, 750m2 building platforms, building design guidelines, fencing controls, rural roading standards and more.

The application was reviewed by Council's Landscape Architect, Ms Yvonne Pfluger. In her peer review she provided the following further recommendations:

- Deletion of Lots 26 – 29.
- Built development, including driveways or activities associated with curtilage areas such as swimming pools, clotheslines, etc, should not occur outside the identified building platforms on lots 30 – 35 (and 26 – 29 if they are not deleted).
- Restriction of building colours to recessive hues and low Light Reflectance Value (LRV).
- Building platforms for lots 30 – 25 (and 26 – 29 if they are not deleted) should be reduced to 500m2 (from 750m2).
- Restriction of building height on lots 2 – 8 to 4.2 metres.
- Set a maximum roof height for buildings on lots 21 – 24.
- Amend the wording of RMM's recommendation in relation to height for lots 26 – 35, to make the wording clearer.
- Provide a planting plan.
- Retain the balance of the RMM recommendations used to mitigate against visual effects (unless modified by an above recommendation).
- Provision of additional information / assessment to include the following:
    - Provision of a design rationale and assessment of the landscape's ability to absorb the proposed change, including the proposed lot densities in different parts of the development.
    - Visual effects on the outlook from residences within existing settlement and from private residences around Bannockburn Inlet.
    - Visual effects experienced from the Dunstan bike trail.
    - Effects on settlement pattern within Bannockburn in relation to the proposed density of buildings.
    - Clarification if an open space covenant is proposed for the balance lot.
    - Effects on landscape and natural character within the Bannockburn Inlet area, including the Kawarau River and its margins.

These recommendations have been considered and where agreed, have been incorporated into the design for the updated 20 lot layout as well as taken into consideration in the assessment that follows.

2.2 Description of the Revised Proposal

The revised proposal is illustrated on Sheet 09 of the GA. Refer also to the application documentation by LandPro. The details of the revised 20 lot proposal are as follows:

- Vehicle access to and from the proposed subdivision will be via Terrace Street.
- The proposal includes 20 residential lots, with a minimum size of 1500m2.
- Lot 30 is a proposed recreation reserve of 0.41 ha.
- Lot 40 is a balance lot of 4.44 ha to remain in the ownership of the Applicant or be transferred to a private landowner to undertake grazing or other rural activities.
- Lot 50 is a balance lot of 7.82 ha which will remain in the ownership of the Applicant.
- Lot 51 is an additional balance lot which will contain infrastructure that may be vested in the future.
- Lot 100 shall be vest with Council and includes a network of interconnected roads, infrastructure, and shared pedestrian and cycle paths to provide a high degree of permeability and connectivity through the subdivision and to the proposed public reserve.
- Public parking is provided for at two locations within the road reserve to facilitate access to the public recreation reserve and the network of shared paths.
- Archaeological sites and features shall be protected / enhanced and incorporated into the road reserve and recreation reserve. Refer to Kopuwai Consulting Report for details.
- Locations for shared access points and/or easements for driveways for lots 15 – 20 have been identified in order to reduce the number of interfaces with the road network and protect archaeological features.
- Proposed design controls are as follows:
    - Building platforms of 500 m2 are proposed on all lots within the BLR Area (Lots 4,5,13,14, 15 – 20). No built development shall be permitted outside the building platform, such as clothes lines, swimming pools or other activities generally associated with a curtilage area.
    - Maximum built coverage of 300 m2 is proposed on all lots. Should any dwellings be two storeys, the maximum footprint for the ground floor will be 200m2.
    - Building height limits above natural grade and maximum roof elevation for each lot are set out in
    - Table ***3*** on the next page.
    - The access to Lot 6 shall be designed to limit the extent of earthworks required, and as far as practicable off the ridgeline.
    - Exterior cladding shall be limited to timber (vertical or horizontal), schist, or corrugated iron in one of the following Colorsteel colours: Lichen, Sandstone Grey, Lignite, Ironsand, FlaxPod, Grey Friars, New Denim Blue.
    - Roofing shall be constructed of corrugated iron in one of the of the following Colorsteel colours (or similar with a light reflectance value (LRV) of the less than 12%): Lignite, Ironsand, FlaxPod, Grey Friars, New Denim Blue.
    - Fencing at lot boundaries shall be limited to 1.2 m high unpainted post and rail, post and wire or waratah and wire fencing. The addition of rabbit wire mesh is encouraged.
    - Subdivision roading shall be asphalt or chip seal and have no kerb and channel.

- Shared paths within the recreation reserve and road reserve shall be local compacted gravel and/or schist stone.

- A plant palette of appropriate plant and specimen tree species for the road reserve, recreation reserve and private lots has been prepared, refer to Appendix A.
- Mitigation planting is proposed within Lot 30 to provide visual screening of built form on lots 5, 10-14 from viewpoints east of the site.
  - Mitigation planting will consist of 40% *Kunzea serotina*, 40% *Leptospermum scoparium*, and 20% *Coprosma propinqua*.
  - Plants will be supplied at PB3 size or larger, and planted at a spacing of 3m centres to achieve sufficient coverage.
  - All plants shall have a slow-release fertiliser, wool mulch collar, and plant guard installed to deter rabbit and hare browsing.
  - A temporary irrigation system shall be installed and operation for the first three years from the date of planting. All planting shall have been installed and healthy for a period of no less than three months from the date of planting prior to Council certification inspection.

Table 3: Maximum Building Height & Roof Elevation

Lot Number(s)	**Maximum Building Height**	**Maximum Roof Elevation**	**Notes**
1, 2, 3	5m	269 masl	
4, 6	4.2m	269.2 masl	
5	4.2m	270.2 masl	
7, 8, 9	7.5m	269 masl	
10	5m	269.5 masl	
11, 12, 13, 14	4.2m	271 masl	Buildings to be stepped with grade
15, 16, 17, 18, 19	5m	265 masl	Buildings to be stepped with grade
20	5m	266 masl	Buildings to be stepped with grade

3.0 Relevant Statutory and Policy Provisions

3.1 Central Otago District Plan

Under the CODC Operative District Plan, the application site is zoned RRA (4), refer to GA Sheet 04-05. The District Plan is currently under review and Plan Change 19 includes a number of proposed changes to the residential zoning within the District Plan. Under Plan Change 19 the site is zoned Large Lot Residential.

Regarding the proposed subdivision, consideration needs to be given to the objectives, policies, rules, environmental results anticipated, and assessment matters contained in the following of the ODP sections:

- Section 7: Residential Resource Area
- Section 12: District Wide Rules and Performance Standards
- Section 16: Subdivision

In the context of Plan Change 19, the following sections of the proposed District Plan have also been considered:

- Plan Change 19 – Large Lot Residential Zone Provisions and Subdivision provisions.

3.2 ODP Rules & Activity Status

The reasons for consent and relevant rules which the proposal is compliant with are set out in detail in section 5 of the Town Planning Group AEE, it is understood the proposal requires a restricted discretionary activity consent for subdivision[6], and a restricted discretionary activity consent for breaching the building line restriction as shown on the District Plan maps[7].

The Building Line Restriction rule is particularly relevant from a landscape perspective. The matters of Council discretion which are included in this summary are only those that are relevant to landscape and visual amenity:

Council shall restrict the exercise of its discretion to the following matters:
1. The effect on the natural character of water bodies and their margins.
2. The effect on amenity values of the neighbourhood in particular the character of the streetscape.

<u>Reason</u>
Building line restrictions are a useful technique to protect amenity values and the safe and efficient operation of certain roads. They are also useful to avoid the effects of natural hazards on the built environment. The area subject to restriction is shown as 'BLR' on the planning maps.

3.3 ODP Relevant Objectives & Policies

[6] ODP Section 7 Residential Resource Area Rule 7.3.3(i)(c).
[7] Section 12 - District Wide Rules and Performance Standards. 10 July 2009. Central Otago District Plan. Page 12:24.

The objectives and policies that are relevant to an assessment of landscape and visual effects are found within Section 7 and 16 of the ODP.

Section 7 – Residential Resource Area

7.1.1 Objective – Maintenance of Residential Character

To manage urban growth and development to maintain and enhance the built character and amenity values of those parts of the district that have been identified as the Residential Resource Area as well as the social, economic and cultural wellbeing, and health and safety of the residents and communities within those areas.

7.1.2 Objective – Protection of Living Environment

To manage the use of land to promote a pleasant living environment by ensuring that adverse effects of activities are avoided, remedied or mitigated, while accommodating appropriate change at the interface with other resource areas.

7.1.3 Objective – Management of Change

To recognise that it is inevitable that the use of land shall change over the period of this plan and beyond in order to enable the community to provide for its wellbeing. The process of change can occur randomly within the various resource areas but will be most obvious at the interface between different resource areas. It is a purpose of this plan to manage that change.

7.2.1 Policy – Residential Character

To ensure that the character and amenity values of residential areas are protected by ensuring that the adverse effects of:

(c) Glare, particularly from building finish, and security lighting,

(d) Structures at the street frontages that do not complement the character and/or scale of development in the neighbourhood,

(e) A reduction in privacy, access to daylight and sunlight

(f) A reduction in visual amenity due to excessive signage, large areas of hard standing surfaces, and the storage of goods or waste products on the site,

7.2.2 Policy – Amenity Values

To ensure that the amenity values of residential sites, including privacy and ability to access adequate daylight and sunlight, are not significantly compromised by the effects of adjoining development.

7.2.3 Policy – Environmental Quality

To preserve the environmental quality found within particular areas of the District's residential environment.

7.2.4 Policy – Recreation Activities

To provide for the wellbeing of the District's communities by requiring developments to recognise and provide for the recreational needs of the community.

7.2.5 Policy – Open Space

To maintain the amenity value of open space within the District's residential environments.

7.2.7 Policy – Residential Resource Areas (1) – (13)

To ensure that subdivision and development in the areas shown as Residential Resource Areas (1) – (13) complement the character and amenity of these areas and provide for the protection of significant landscape features, where such features are present.

The area of land identified as Residential Resource Area (4) applies to Bannockburn, on the eastern side of Bannockburn Road and both sides of Hall Road west until just beyond Miners Terrace. The area is capable of accommodating low density residential development in a manner that provides privacy for the occupiers of dwelling houses and maintains the rural character of Bannockburn. An open form of development is promoted.

Section 16 – Subdivision

16.3.4 Objective – Amenity Values

To ensure, where appropriate, that amenity values of the District created by the open space, landscape and natural character values, and areas of significant indigenous vegetation, significant habitat of statutorily managed sports fish and game are not adversely affected by subdivision.

16.3.6 Objective – Heritage Values

To ensure that subdivision does not facilitate development that may adversely affect heritage and cultural values including cultural values of importance to Kai Tahu ki Otago.

16.3.7 Objective – Open Space, Recreation and Reserves

To ensure that subdivision contributes to the open space, recreation and reserve needs of the community.

16.3.8 Objective – Public Access

To ensure, where appropriate, that subdivision maintains and where appropriate enhances public access:
(a) To and along the margins of the District's lakes and rivers.
(b) To the District's reserves and areas of public open space.
(c) To sites of heritage and cultural values.
(d) To sites of cultural importance to Kai Tahu ki Otago

16.4.7 Policy – Subdivision Design

To require that the design of subdivision, where relevant to the intended use, provides for the following matters:
(e) Facilitates adequate provision of, or contribution to, the open space, recreational and reserve needs of the community with physical links to existing reserve areas where this is practicable.

(f) Facilitates an appropriate level of access to heritage sites, natural features and water bodies where appropriate.
(g) Facilitates development which keeps earthworks to a minimum.
(h) Facilitates retention of the heritage values of a site or area.

3.4 PC19 Rules & Activity Status

The site is zoned Large Lot Residential (LLRZ) under PC 19. None of the PC19 rules have legal effect.

3.5 PC19 Relevant Objectives & Policies

The relevant objectives and policies within the LLRZ which are relevant to an assessment of landscape and visual effects are:

Large Lot Residential Zone

LLRZ-O1 Purpose of the Large Lot Residential Zone

The Large Lot Residential Zone provides primarily for residential living opportunities.

LLRZ-O2 Character and amenity values of the Large Lot Residential Zone

The Large Lot Residential Zone is a pleasant, low-density living environment, which:

1. *contains predominantly low-rise and detached residential units on large lots;*
2. *maintains a predominance of open space over built form;*
3. *provides good quality on-site amenity and maintains the anticipated amenity values of adjacent sites; and*
4. *is well-designed and well-connected into the surrounding area.*

LLRZ-P1 Built Form

Ensure that development within the Large Lot Residential Zone:

1. *provides reasonable levels of privacy, outlook and adequate access to sunlight;*
2. *provides safe and appropriate access and on-site parking;*
3. *maintains a high level of spaciousness around buildings and a modest scale and intensity of built form that does not unreasonably dominate adjoining sites;*
4. *is managed so that relocated buildings are reinstated to an appropriate state of repair within a reasonable timeframe;*
5. *provides generous usable outdoor living space for residents and for tree and garden planting;*
6. *maintains the safe and efficient operation of road;*
7. *mitigates visual effects through screening of storage areas and provision of landscaping; and*
8. *encourages water efficiency measures.*

4.0 Landscape Description

4.1 Description of the Receiving Environment

Bannockburn is a small historic township located at the south end of the Cromwell Basin, separated by the Kawarau River, some 7kms southwest of Cromwell. The township lies at the bottom of the Bannockburn Valley, surrounded by the Carrick Range to the west, Old Woman Range to the south, and Cairnmuir Mountains to the east.

Bannockburn Road is a two-lane asphalt road which runs in a south-west direction between Cromwell and Bannockburn via the Kawarau River bridge. Bannockburn is surrounded by the rugged, semi-arid and somewhat barren high-country environment, shaped in geological time by a combination of glaciation and fluvial processes and more recently human activity in the form of mining, agriculture, viticulture, and horticulture. The town itself is constrained by the surrounding topography including the terraces around Bannockburn Inlet and Shepherds Creek to the east and the alluvial tailings landforms of Bannockburn Sluicings Historic Reserve to the north and Smiths Gully to the south.

Current land use around Bannockburn is predominately pastoral farming, viticulture, and horticulture. Rural lifestyle properties and holiday homes are located throughout the working rural landscape with a greater concentration of dwellings and built form in and proximity to the historic township of Bannockburn. This concentration of dwellings extends in an east-west direction along Terrace and Lawrence Street to the east and Domain and Hall Road to the west. The pattern of settlement consists of large lot residential varying in size from 1500-3000m2 with some recent subdivision of lots at around 1000m2 closer to the historic town centre. The historic township of Bannockburn is centred around the historic General Store, Bannockburn Hotel, and the Black Rabbit café, which provide a somewhat disconnected and informal town centre.

In the wider landscape, vegetation is generally sparse, consisting of rough pasture grass, tussock, matagouri, wild thyme and sweet briar. Small groups of exotic poplar and willow trees identify sites of early habitation.

Drainage patterns are an intricate network of permanent and ephemeral watercourses which drain into Bannockburn and the Kawarau River, confined to a steep sided gorge to the north and Bannockburn Inlet to the east, separating Bannockburn from Cromwell. Bannockburn Inlet recreational reserve and boat ramp are located within this sheltered area. The inlet is popular for swimming and recreational activities and used extensively by locals and visitors.

The landscape character of Bannockburn has been formed by a combination of natural and human forces. Bannockburn has a rich mining history, with many sites of historical significance. Natural landforms of rocky outcrops, steep gullies, and alluvial terraces contrast with the patterns of human intervention, including dwellings, remnants of sluicing's and alluvial tailings, vineyards, trails, water races and fence lines. There is a distinct change in landform between the rugged high country landscape surrounding Bannockburn and the gentler and more open landform of lower hillslopes and terraces of nearby Cairnmuir Road and the Cromwell Basin, which are highly modified and intensively cultivated in the form of orchards and vineyards.

4.2 Description of the Site

The site is located at 88 Terrace Street, Bannockburn and is legally referred to as Lot 4 DP339137. It is a large vacant semi-rural property situated to the east of the historic township of Bannockburn. The site is 17.6 ha in area and is roughly parallelogram in shape.

The Site is located east of Bannockburn Road and is bound to the north by 'Slaughter Yard Hill', to the south by Terrace Street and Smith's Gully, and to the east by a private property which includes a quarry site and borders Cairnmuir Road and the Bannockburn Inlet. The site is accessed by vehicle from Terrace Street and from a farm gate on Bannockburn Road. *Refer Sheet 06 of the GA for the Site Context Plan*.

The Site is bordered by development along Bannockburn Road and Terrace Street including single family dwellings on sections ranging from 1500 – 2700 m2 and several commercial businesses on Bannockburn Road within the historic township of Bannockburn. There are no existing built structures on the Site. A number of well-used but informal walking tracks run through the Site. The main track runs from the vehicle entry on Bannockburn Road to Bannockburn Inlet on the Kawarau River arm. It is understood that the community uses these informal tracks despite them being on private property.

Vegetation consists of dryland pasture grass, wild thyme, briar rose, broom, and other weed species. There are random groupings of exotic poplar and willow tree species growing throughout the site as well. No significant native vegetation is known to exist on the subject site.

The landforms and terrain of the subject site are varied, consisting of alluvial schist gravels overlying schist rock outcrops and sedimentary deposits. The landforms are significantly modified due to previous human occupation and use as a mining site. Historic remnants of this activity are present including water races, sluice faces, sludge channels and old fence lines. *Refer to Sheet 08 of the GA for the Archaeological and Historical Features Plan.* Refer also to the Kopuwai Consulting report dated December 2023 for a full commentary on archaeological, heritage and recreational amenity matters concerning the subject site and current application.

The west part of the Site, adjacent to Bannockburn Road, is generally flat and open. It appears to be well used by people and includes additional informal walking tracks and home-made dirt jumps for wheel sports. This area is predominantly flat to gently sloping, with grades falling from 254 to 244 masl from west to east. There are two small high points within this area created from mounds of excavated material, these points sit at 255 and 251 masl.

The east part of the site encompasses the landform of Water Race hill which is accessed from the end of Terrace Street. This area of the site has two high areas of 270 and 268 masl which are somewhat flat to rounded on top but give way to steeply sloping embankments to the north, south, and east. The north embankment forms the south side of a gully that connects the central site to the Bannockburn Inlet. Grades through the gully are varied but generally fall to the east. Slaughter Yard Hill, on the adjacent property, forms the north side of the gully. *Refer to Sheet 07 of the GA for the Site Topography Plan.*

The BLR (building line restriction) located within the site aligns relatively closely too, or in places on the 'town side' of the ridgeline of Water Race Hill, surrounding an area of lower landform and was established in 1987 by the Transitional (Vincent County) District Plan and initiated by a Plan Change. It is our understanding that the original purpose of the BLR was to contain Bannockburn within a 'hollow' so as not visible from the Cromwell Basin and to protect views around the Bannockburn Inlet.

4.3 Landscape Values of the Receiving Environment & Site

Physical

*"**Physical*** [8] *means both the natural and human-derived features, and the interaction of natural and human processes over time."* [9] Typical physical factors include geology, topography, hydrology, ecology, climate, vegetation, biological elements, settlement patterns, buildings, heritage features and tāngata whenua features within the landscape.

The physical values of the site and receiving environment include:

- The barren semi-arid high country landforms surrounding Bannockburn and the Cromwell Basin are recognised by several Significant Amenity Landscape and Outstanding Natural Landscape overlays.
- The incised gorge of the Kawarau River is a significant landscape and hydrological feature in the region and is recognised as an Outstanding Natural Landscape.
- The undulating topography of the terraces, escarpments, gullies, rock outcrops, and hillocks within the site and immediate context are complex and largely contain the township of Bannockburn, the Bannockburn Inlet, and the lower elevations of the Site and contributes to the character of the site and receiving environment.
- Historical character of some of the buildings provide a distinctive identity.
- The physical human-made features of the site including water races, sluice faces, sludge channels and old fence lines provide a distinctive identity and speak to the heritage of Bannockburn and the site.

Perceptual

"Perceptual *means both sensory experience and interpretation. Sensory appreciation typically occurs simultaneously with interpretation, knowledge, and memory."* [10] Typical perceptual factors relate to experiential and aesthetic qualities such as naturalness, visual coherence, legibility as well as transient aspects.

The perceptual values of the site and receiving environment include:

- The natural character of the Kawarau River and Bannockburn Inlet which is derived from natural qualities such as the colour and clarity of the water, the incised gorge of the river and the irregular shoreline of the Inlet, and the surrounding topography of hills and terraces as well as the perceived naturalness of the vegetation patterns on the terraces, gullies, and river margin.
- The pastoral, viticulture and horticulture land use contribute to a rural working landscape character within the site and receiving environment. The viticulture and horticulture uses in particular are unique to this region of Central Otago and are aesthetically pleasing as well as memorable and contribute to a general sense of rural amenity.

[8] 'Physical' means both natural and human features, whereas 'biophysical' is potentially problematic if it is taken to mean only the natural aspects of the landscape rather than both natural and human features/processes. 'Te Tangi a te Manu: Aotearoa New Zealand Landscape Assessment Guidelines'. Tuia Pita Ora New Zealand Institute of Landscape Architects, July 2022. Page 79.

[9] 'Te Tangi a te Manu: Aotearoa New Zealand Landscape Assessment Guidelines'. Tuia Pita Ora New Zealand Institute of Landscape Architects, July 2022. Page 79.

[10] 'Te Tangi a te Manu: Aotearoa New Zealand Landscape Assessment Guidelines'. Tuia Pita Ora New Zealand Institute of Landscape Architects, July 2022. Page 79.

- The open character of the Bannockburn Valley and, even more so, the Cromwell Basin landscape provides views of high scenic quality to the surrounding hills and mountains.
- Transient values such as lighting, the changing colour of the Kawarau River, autumn colour, snow on the mountain ranges and other seasonal changes contribute sensory appreciation, visual amenity, and memorability.
- Climate extremes contribute to the character of the locality.
- The landforms of the site, surrounds, and the river gorge are highly complex, memorable, and legible.
- The aesthetic quality of the site and surrounds draws on the recent pastoral and mining history due to the modified pastoral landcover as well as the prevalence of historic remnants, sluicings, and alluvial tailings.
- The open (unbuilt) and pastoral character of the lower site contributes to the rural amenity of Bannockburn's historic town centre.
- A sense of ruggedness and naturalness (despite significant human modification) is imparted by the steep and undulating landforms of the site and sparse vegetation cover.
- The east escarpment of the site exhibits a visual simplicity due to the smoothness of the landform and the simple and cohesive vegetation cover.
- The historic Bannockburn Hotel and General Store are memorable buildings within the historic town centre.
- There is a lack of definition to the main street, the heart of Bannockburn.
- The settlement pattern of Bannockburn maintains a somewhat rural character given the low density of built form, proximity of pastoral and viticultural activities, contained nature of the township by landform, and the views to the surrounding landscape.

Associative

***"Associative** means the intangible things that influence how places are perceived – such as history, identity, customs, laws, narratives, creation stories, and activities specifically associated with a landscape."* [11] Typical Associative factors includes cultural (tangata whenua) and historic values as well as shared and recognised attributes such as recreational opportunities.

Associative values of the site and receiving environment include:

- Bannockburn has a rich mining history, which is associated with sites of early habitation, historical buildings, and sites of historical significance. As well as the stories of previous times and former inhabitants.
- There are notable historic values attached to the past use of the site which are evident in the landscape through the presence of historic remnants in the form of water races, sluice faces, sludge channels and old fence lines.
- There are recreation values associated with the site and the wider landscape including Bannockburn Inlet, the Lake Dunstan Trail, and the Bannockburn Sluicings historic reserve.
- Holiday home community.

[11] 'Te Tangi a te Manu: Aotearoa New Zealand Landscape Assessment Guidelines'. Tuia Pita Ora New Zealand Institute of Landscape Architects, July 2022. Page 79.

- There are rural production and farming values attached to the surrounding pastoral, viticultural and horticultural land uses. These activities are specifically associated with the landscape of the Cromwell Basin, especially the production of Central Otago wines and summer stone fruit crops, which contribute to the unique identity of the region.

5.0 Assessment of Landscape and Visual Effects

5.1 Potential Issues

The potential landscape and visual effects arising from the proposal that I have considered include the following:

- Effects associated with the breach of the BLR.
- Effects on the character, amenity, and settlement pattern within Bannockburn.
- Effects on the natural character of the Kawarau River and Bannockburn Inlet.
- Effects on the site's values including the open and rural character and the perceived ruggedness and naturalness of the site's landforms and vegetation patterns.
- Effects on the heritage and recreation values of the site, including on specific archaeological features. Refer to Kopuwai Consulting report for a full commentary on archaeological, heritage, and recreational amenity matters.
- Visual amenity effects from public places within the surrounding area, particularly from locations east of the site, as well as from Bannockburn township and neighbouring private properties and businesses.

5.2 Assessment of Landscape Effects

"A landscape effect is a consequence of changes in a landscape's physical attributes on that landscape's values. Change is not an effect: landscapes change constantly. It is the implications of change on landscape values that is relevant." [12]

Effects from the BLR Breach

The BLR (building line restriction) located within the site follows the ridgeline of Water Race Hill surrounding an area of lower landform and was established in 1987 by the Transitional (Vincent County) District Plan and initiated by a Plan Change. It is our understanding that the original purpose of the BLR was to contain Bannockburn within a 'hollow' so it would not be visible from the Cromwell Basin and to protect views around the Bannockburn Inlet.

Since its inception, the township of Bannockburn has seen growth, but in regards to the original BLR, this appears 'intact' in terms of buildings encroaching into it. However, despite this, development (housing and curtilage) adjacent to the ridgeline, particularly along the crest of Hall Road, Domain Road and Terrace Street are visible from the wider Cromwell Basin, including from Bannockburn Inlet and locations east of the site (as demonstrated by several of the viewpoint photographs). Therefore, it could be reasonable to conclude that landscape change arising from the proposed development within the BLR is not a 'new' proposition in terms of visibility of existing development within the immediate setting and that there is potential for the landscape to absorb some development beyond the BLR within this location.

The sensitivity of the elevated and exposed topography (escarpment) of the area of the site within the BLR overlay has required careful design of the subdivision proposal. For this area of the subject site, the current proposal includes a reduced number of lots as compared to the previous application. In the proposed 20 lot layout those lots that are located within the BLR are generally

[12] 'Te Tangi a te Manu: Aotearoa New Zealand Landscape Assessment Guidelines'. Tuia Pita Ora New Zealand Institute of Landscape Architects, July 2022. Page 135.

viewed in the context of other existing built form (as described in the Visual Effects section of this report) and will appear as an extension of built form along Terrace Street. The reduction in lots within the BLR, paired with the recommended design controls including reduced (500m2) building platforms on those lots within the BLR area , height limits, planting mitigation and rules regarding materials and colour will ensure that the proposed built form within the BLR will not result in unacceptable adverse effects.

Visual amenity effects associated with visibility of built form within the BLR are discussed in the visual assessment section of this report.

Effects on the Character of Bannockburn

Given the current zoning within the CODP, it is accepted that the landscape of the subject site has the capacity to be developed in line with the provisions for RRA(4). The CODC promotes an open form of development within RRA(4), allowing for low density residential activity within the zone so long as any such development maintains the character of Bannockburn. Further to this, the Cromwell Masterplan identifies Bannockburn as being a 'node' which can accommodate future residential development[13].

The proposed residential lot sizes comply with the minimum size as set out in the provisions for RRA (4) and are also generally consistent with lot sizes on Terrace Street and within the centre of Bannockburn. In addition to the 20 proposed residential sites, Lot 30 will be vested with Council as a public reserve, Lot 40 will remain in private ownership to be used for rural productive activities such as grazing, and Lot 50 will serve as a balance lot. As a result, a dominance of open space will remain and development patterns will be consistent with existing settlement within Bannockburn.

While the proposed subdivision does constitute an extension of the semi-urban form of Bannockburn, this change can be anticipated based on the ODP RRA(4) zoning and the proposal seeks to maintain the specific rural character and amenity of Bannockburn and the wider receiving environment through adherence to the RRA(4) minimum lot size and design controls to ensure built form is in keeping with the local vernacular. Additionally, the proposal will maintain open space, rural outlook, and recreation amenity through the designation of a public reserve and the establishment of Lot 40 and the balance lot (Lot 50).

It is therefore considered that the proposal will not result in adverse effects on the character of Bannockburn.

Effects on the Natural Character of the River and Inlet

The natural character of the Kawarau River and Bannockburn Inlet have been identified as important values. As described previously, the natural character of the Kawarau River and Bannockburn Inlet are derived from natural qualities such as the colour and clarity of the water, the incised gorge of the river, the irregular shoreline of the Inlet, and the surrounding topography of hills and terraces as well as the perceived naturalness of the vegetation patterns on the surrounding terraces, gullies, and river margin.

Potential adverse effects on the natural character of the Kawarau River and Bannockburn Inlet are primarily related to the proposed development of lots 15-20 on the east facing escarpment above the Inlet. These lots are in breach of the BLR and it is understood that the purpose of the BLR is to protect views from the Inlet.

[13] Cromwell Masterplan Stage 1 – Spatial Plan, (June 2019) – P29.

Regarding potential adverse effects on the natural character of the Bannockburn Inlet, the proposed built form within the BLR will result in new built form on the slopes above the Inlet. While located well away from the water body margin this will constitute a modification to the landforms surrounding the inlet which contribute to its natural character. As a result, it is likely that built form on the terraces surrounding the Inlet will result in a reduction in natural character. This is considered to be an adverse effect of a low-moderate degree.

Visual amenity effects as experienced from the Bannockburn Inlet are discussed in the visual assessment section of this report.

Effects on the Site's Values

The site's values have been described previously. To summarise, these include:

- The open and unbuilt nature of the site and the pastoral character of the lower site.
- The perceived naturalness and ruggedness of the site due to topography and the sparse vegetation cover.
- The complex, legible, and memorable landforms of the site.
- A general sense of rural amenity and a working rural character.
- Heritage values associated with the mining history of the site and the physical remnants of this activity.
- An aesthetically pleasing environment due to the combination of factors described above.

The proposed subdivision will result in a substantial change to the site through the introduction of built form, roading, street trees, and amenity planting. This will result in a reduction in the perceived naturalness and ruggedness of the site, a reduction in the open and unbuilt nature of the site, and a reduction in rural amenity and the working rural character.

While these changes are largely anticipated given the underlying zoning, the proposed level of development is potentially greater than would be expected for the site given the breach of the BLR and therefore it is anticipated that adverse effects on the values of the site will be low-moderate. However, considering the proposal overall, the establishment of Lot 30 as a local reserve and Lot 40 and 50 as balance lots, the site will retain a dominance of open space and rural amenity.

Effects on Heritage & Recreation Values

The layout of the proposed subdivision acknowledges and seeks to maintain where possible the heritage values of the subject site. The Kopuwai Consulting report provides further recommendations to ensure these values are retained.

A significant positive outcome from the proposal is the allocation of Lot 30 as a vested public reserve. This is to provide opportunities for recreation with potential to establish a look out for viewing the Bannockburn Inlet and the mountain ranges in the distance. In addition, a series of informal paths are proposed through the road reserve (Lot 100) and Lots 30, 40, 51, and 50 which will provide recreation opportunities and establish long term connectivity to Bannockburn Inlet for all Bannockburn residents.

Landscape Effects Summary

The development envisaged by this subdivision proposal carries and builds upon the existing development along Terrace Street. Therefore, one needs to consider that landscape effects will be in the context of this adjacent, and, in places, recent residential development. Given the recommended design controls and guidelines, it is considered the nature and scale of a revised 20 lot proposal will better align with and not degrade or erode the overall landscape values and landscape character of the receiving environment, ensuring the unique character, sense of place, and heritage values of the site and surrounding environment are acknowledged and maintained.

5.3 Assessment of Visibility and Visual Effects

"A visual effect is a kind of landscape effect. It is a consequence for landscape values as experienced in views. Visual effects are a subset of landscape effects. A visual assessment is one method to help understand landscape effects." [14]

The significance of the visual effect is influenced by the visibility, distance, duration of the view, the scale, nature and duration of the proposal, its overall visual prominence, the context in which it is seen, and the size of the viewing audience.

Whether the proposal is considered appropriate is determined by the visual effects on the receiving environment and whether the landscape values attributed to this setting are retained or whether, if adversely affected, effects can be satisfactorily avoided, remedied or mitigated.

As a preliminary desktop study, ZTV mapping has been undertaken to demonstrate the potential extent of visibility from public places. This desktop analysis found that the proposed subdivision will not be visible from most locations within the wider area and the extent of visual effects will, for the general public, be confined to a select few locations within a 5km radius, primarily to the immediate west of the site and in longer views from the east.

Viewpoints 1-11 represent views experienced by the public from Bannockburn Inlet, Bannockburn Boat Ramp, Cairnmuir Road, Patersons Road, Bannockburn Road, and Terrace Street. These were selected as the most representative views based on the places where the proposed subdivision will be the most visible to the public and at varying degrees. It is important to note that some of the views of the proposed development will be in the context of the site being modified for residential suburban development, i.e. foreground views from Bannockburn Road. Therefore, in this context existing 'rural character' is also 'undeveloped suburban land'.

Many of these viewpoints were assessed in the original application and so it is fitting that the same viewpoints are reassessed is the context of the revised 20-lot proposal. However, additional locations have also been considered in accordance with Ms Pfluger's recommendations from the peer review undertaken for the original application. In some instances, the photographs have been taken from representative locations and have not been taken in accordance with LVA photo standards.

The actual and potential visual effects of the proposal have been assessed from these locations, under the following headings. Refer to Sheet 10 of the GA for the Viewpoint Location Map.

[14] 'Te Tangi a te Manu: Aotearoa New Zealand Landscape Assessment Guidelines'. Tuia Pita Ora New Zealand Institute of Landscape Architects, July 2022. Page 135.

Viewpoint 1



Figure 1: Viewpoint 1 from Cromwell Historic Precinct

Viewpoint 1 is from the Cromwell Historic Precinct, looking in a south westerly direction, approximately 5kms from the site. Refer to Sheet 11 of the GA.

From this viewpoint at the Historic Museum, a complex panorama is experienced. The view looks across Lake Dunstan towards Bannockburn and the surrounding mountainous landscape. Dwellings are present in the landscape surrounding the lake as well as planting of deciduous and evergreen trees along the lake margin and in the distance. Built form of Bannockburn and nearby rural residential dwellings is visible at a great distance but largely obscured by vegetation in the foreground.

Given the significance of the Cromwell Historic Precinct as a historic and tourist site, observers are likely to include both locals and tourists. This view is appreciated for its recreation values in the context of the Lake Dunstan Trail and lake activities, its heritage values in connection to the history of Cromwell, and its scenic quality attributed to the junction of the Kawarau and Clutha Rivers and the mountain peaks surrounding the Cromwell Basin.

The view from this location looks toward Bannockburn and the site, however given the distance, complex panorama, and mitigation afforded by surrounding topography and vegetation in the foreground, the visibility of the proposed development will be barely noticeable and constitute only a very small component of the view. The proposal will be readily absorbed by the surrounding landscape and, if discernible, will likely be seen alongside recent adjacent residential development, as a result I consider the magnitude of change in this view to be very low. The proposed development will blend in with the scale and pattern of the landscape and will maintain the existing visual amenity values experienced from this viewpoint. The resulting nature of the visual effect is neutral.

Viewpoint 2



Figure 2: Viewpoint 2 from Cairnmuir Road near Bald Hills Vineyard

Viewpoint 2 is from Cairnmuir Road near Bald Hills Vineyard entry, as viewed in a westerly direction, some 2.4km from the site. Refer to Sheet 11 of the GA.

Cairnmuir Road is situated within the lower hills and terraces located east of the site and provides access between Bannockburn and Cornish Point. The area is intensively farmed with many orchards and vineyards within the surrounding area.

Observers will include both locals and tourists. This view would most likely be experienced while travelling in a vehicle and is likely travelled less frequently than gateway roads, such as Bannockburn Road.

The current scene is aligned roughly with the direction of travel along Cairnmuir Road. A vineyard is visible to the left of the road with a powerline running parallel to the road. In the right side of the scene, the Kawarau River is visible, including the western bank which features a steep escarpment with clusters of evergreen trees above. In the distance the mountain ranges are visible with the low hills of Bannockburn, including the site, visible in the mid ground. Built form within Bannockburn on Domain Road above the Bannockburn Sluicings, Hall Road and Terrace Street is visible on the hills and terraces. Human modifications in the form of mining activity remnants is visible on the face of several hillsides.

Values portrayed in the current scene include rural character and amenity, attributed to the dominance of rural productive activities and lack of built form, and high scenic quality, attributed to the visibility of the Kawarau River and the scenic backdrop of the mountains.

From this viewpoint, future dwellings on lots 15 – 20 on the south end of the east escarpment as well as lots 13 – 14 will potentially be visible as well as partial roof lines of dwellings on lots 4 – 6 and 9 which may breach the edge of the terrace landform. However, the proposed built form will be viewed against a backdrop of foothills and mountain ranges and in the context of visible built form along Terrace Street, Hall Road, and Domain Road as well as productive land uses and rural lifestyle properties in the foreground. The proposed design controls will further integrate the proposed development into the existing landscape.

The magnitude of change for this view will be low as the proposal is viewed from a long distance, is small in the context of the scene and will not contrast with the existing pattern of settlement visible from this viewpoint. As a result, I consider that adverse effects on the visual amenity will be very low. The proposal will integrate seamlessly into the current visual environment with very little material loss to the rural amenity and scenic quality of the overall scene.

Viewpoint 3



Figure 3: Viewpoint 3 from Cairnmuir Road near Carrick Winery & Vineyards

Viewpoint 3 is from Cairnmuir Road near Carrick Winery & Vineyards and Cairnmuir Motor Camp, as viewed in a westerly direction, some 900m from the site. Refer to Sheet 12 of the GA.

As described previously, Cairnmuir Road provides access between Bannockburn and Cornish Point.

This view is considered to be representative of views experienced by locals and visitors travelling on Cairnmuir Road and also representative of views from private rural residences along Cairnmuir Road. However, it should be noted that this viewpoint is taken through a gap in an existing shelterbelt and that visibility of the site varies considerably as one travels along Cairnmuir Road.

The current scene looks across an open paddock toward the site which is visible in the mid-ground. Development along Terrace Street is visible on top of the adjacent landform with some development also visible through the gully separating Water Race Hill and Slaughter Yard Hill. The right side of the scene is somewhat obscured by deciduous trees but takes in the landforms and terraces south of Bannockburn Inlet which are planted with vines.

Values portrayed in the current scene include working rural character and rural amenity due to the open and unbuilt nature of the scene and the prevalence of rural productive activities. Scenic quality is high due to the visibility of the mountain ranges in the distance and the complex layered effects of the terraces, hills, and escarpments in the mid-ground. From this location the site exhibits a visual simplicity due to the smooth slope of the east escarpment and the cohesive landcover.

From this viewpoint location, there will be clear views of dwellings on lots 15 – 20 on the south end of the escarpment, due to the elevated position of these lots. Dwellings on lots 12 – 14 will also be visible and the dwelling on lot 9 will be partly visible through the gully due to the angle of the view. Roof lines from dwellings on lots 2 – 5 and 9 – 11 are likely to protrude above the edge of the terrace landform though will be largely screened by street trees and the mitigation planting once established. The proposed built form will be viewed against a backdrop of foothills and mountain ranges and in the immediate context of visible built form along Terrace Street which is visible in the current view to the south-west of the site and west through the gully towards Bannockburn village centre. Earthworks within lots 100 and 101 for the road and the walking track will also be somewhat visible in the short term.

The magnitude of change as experienced from this viewpoint is considered to be low due to the small scale of the proposal in the scene. Further, in the context of the existing visible development, the proposed design controls and mitigation planting, it is likely that the proposal will not contrast significantly with the existing scene and will appear as an extension to existing visible built development. As a result, I consider that adverse effects on visual amenity as experienced from this viewpoint will be low-moderate. This change will result in a small reduction in rural amenity and scenic

quality due to the temporary effects of earthworks and the increase in built form on Water Race Hill. It will also contribute to a minor loss in the visual simplicity of the site as perceived from this location.

Viewpoint 4



Figure 4: Viewpoint 4 from the Lake Dunstan Trail near Carrick Winery

Viewpoint 4 is from the Lake Dunstan Trail near the Carrick Winery, as viewed in a westerly direction, some 800 m from the site. Refer to Sheet 12 of the GA.

The Lake Dunstan Trail is a recently completed cycle trail from Cromwell to Clyde which opened in early May 2021. From Cromwell, the trail heads south following the west bank of the Kawarau arm of Lake Dunstan, crossing at the Kawarau Bridge and heading south-east to loop around Bannockburn Inlet before climbing a series of switchbacks up to Carrick Winery. The trail then follows the east bank to Cornish Point before pivoting to the south-east and following the west bank of the Dunstan arm through the Cromwell Gorge on to Clyde.

The site is visible from the section of trail that loops around the Bannockburn Inlet and follows the east bank between Carrick Winery and Cornish Point.

Views from the trail are varied and take in a complex and scenic landscape. They are experienced in motion so those areas where cyclists are likely to pause to take in the landscape or where they have views of the site in the direction of travel are most notable, these include the Bannockburn Reserve and toilet, the Boat Launch and Swimming Beach, and after the switchbacks up to Carrick Winery. The majority of cyclists undertake the trail starting from Cromwell and ending in Clyde, after reaching Carrick Winery views of the subject site become more distant and are oblique (not within 90 degrees of the direction of travel). However, traversing the trail in reverse, the site can generally be viewed in the direction of travel along this section.

Viewpoints from the Lake Dunstan Trail have been compared to the Viewpoints previously assessed finding that Viewpoints 5, 6, and 7 are consistent with key views experienced while traversing the section around Bannockburn Inlet. In addition, views from the section between Carrick Winery and Cornish Point are like more distant views from Cairnmuir Road (Viewpoint 2), thus it is considered that the assessment of visual effects for these viewpoints is representative of the potential adverse effects which may be experienced from the Lake Dunstan Trail. Viewpoint 4 captures an additional viewpoint from the trail near Carrick Winery that has not been considered previously, being a primary location for riders to pause and take in the landscape.

Viewpoint 4 is an elevated view from the trail near Carrick Winery looking west. Observers are likely to be cyclists traversing the Lake Dunstan Trail but could also include other recreation users as individuals could also walk this section of the trail. Being located in close proximity to Carrick Winery,

this view is also considered to be representative of the view from the winery overlooking the Inlet. Therefore, visitors to the winery are likely to experience a similar view.

The current scene takes in the Inlet and the surrounding landforms including the site. In the distances, the mountains of Carrick Range are visible. A mix of pastoral rural activities and viticulture activities are present on the hills and terraces interspersed with more natural patterns of vegetation along the margin of the water body and within the gullies. The distinctive cut faces from mining activities are notable. Rural dwellings are dotted through the landscape with a cluster of development on Terrace Street visible just to the left of the site.

The scene displays a high degree of scenic quality due to visibility of the Inlet, hills and terraces, and mountains in the distance. Modifications to the land in the form of sluice faces, vehicle tracks, pasture, and vineyards are visible in the current view and contribute to a sense of rural amenity and a working rural character. This is contrasted by the naturalness of the landforms and the vegetation patterns in the gullies and around the Inlet.

From this viewpoint location, future dwellings on lots 12 – 14, and 15 – 20 will be visible. Roof lines from lots 4, 5, 10 and 11 may also be visible, protruding above the edge of the terrace landform though will be largely screened by street trees and the mitigation planting once established. The future dwelling on lot 9 may be partly visible through the gully. The proposed built form will be viewed against a backdrop of foothills and mountain ranges and in the immediate context of the adjacent visible built form along Terrace Street. Earthworks within lots 100 and 101 for the road and the walking track will also be somewhat visible in the short term.

The magnitude of change as experienced from this viewpoint is considered to be low due to the complexity of the view and small proportion of the development which will be visible. In the context of the existing visible development, the proposed design controls and mitigation planting, it is likely that the proposal will not contrast significantly with the existing scene. This change will result in a small reduction in rural amenity and scenic quality due to the temporary effects from earthworks and the increase in built form on Water Race Hill. As a result, I consider that adverse effects on visual amenity as experienced from this viewpoint will be low-moderate.

Viewpoint 5



Figure 5: Viewpoint 5 from Bannockburn Inlet Boat Ramp and Swimming Area

Viewpoint 5 is from Bannockburn Boat Ramp and Swimming Area, as viewed in a westerly direction, some 800m from the site. Refer to Sheet 13 of the GA.

The Bannockburn Inlet Boat Ramp is situated directly opposite the Recreation Area, at the eastern edge of Bannockburn Inlet. It is a safe and sheltered area used by locals and visitors for boat launching and swimming.

Observers from this location will include locals and visitors that are undertaking recreation activities associated with the Inlet and the Lake Dunstan Trail.

The current scene takes in the waters of the Inlet in the foreground with the south shoreline visible in the left part of the scene. Across the Inlet, Water Race Hill and Slaughter Yard Hill are visible including the gully between them and several cut faces which are evidence of the mining history of the area. Cairnmuir Road is visible as a cutting above the lake edge in the right half of the scene. Vegetation along the edge of the Inlet is primarily a mix of exotic deciduous species with scattered shrubs and pasture within the gullies and on the open slopes. The mountains of the Carrick Range are visible in the distance but are just barely visible above the Water Race Hill and Slaughter Yard Hill given the lower elevation of the viewer.

Values portrayed by the current scene include rural character and amenity which is associated with the open and unbuilt nature of the hills. The scenic quality is high and relates to the appreciation of the view across the water, including the play of light, weather and reflections on the surface, as well as the complex topography and a sense of ruggedness imparted by the terrain in combination with the sparse vegetation cover. Further, the hills and terraces contribute to the sense of containment experienced from Bannockburn Inlet.

From this viewpoint, lots 15 – 20 will be visible at the south end of the east facing escarpment due to the elevated position of these lots. Buildings situated within these lots will not break the skyline but will be readily noticed by an observer, forming a visible and recognisable element within the overall scene. The proposed design controls including height controls, material and colour selection, and the proposed plant palette will aid in visually settling future dwellings into the existing landscape. In addition, dwellings within lots 5, 10 – 14 may also be potentially visible as the roofline of these dwellings may breach the edge of the terrace landform. However, these dwellings will be seen against a backdrop of the Carrick Range and are anticipated to be mostly screened by the proposed mitigation planting in time. Earthworks within lots 100 and 101 for the road and the walking track will also be somewhat visible in the short term.

The magnitude of change for this view given the scale of the proposal in the overall scene and the potential scale and colour of the built form (as guided by the design controls) is anticipated to be low. Dwellings on lots 15 – 20 will be visible but will form a small part of the overall scene and will not be visually dominant due to the specification of design controls including building height, platform areas and aesthetic design standards. However, from this viewpoint, this is likely to be the only built form visible and therefore a new element in the view. This change will constitute a minor loss of the key values for this scene, being rural amenity, the ruggedness of the topography, and the sense of containment due to the temporary effects of earthworks and the introduction of built form on an elevated and currently open hillside. As a result, I consider that adverse effects on visual amenity as experienced from this viewpoint will be low-moderate.

Viewpoint 6



Figure 6: Viewpoint 6 from south of Bannockburn Recreation Reserve

Viewpoint 6 is from south of Bannockburn Recreation Reserve, where there is a second open space area with picnic tables and lawn adjacent to the shoreline of Bannockburn Inlet. This site is visible from this area, when looking in a westerly direction. This viewpoint is located approximately 200m from the site. Refer to Sheet 13 of the GA.

Observers from this location will include locals and visitors that are undertaking recreation activities associated with the Inlet and the Lake Dunstan Trail.

The current scene takes in Water Race Hill, which is elevated above the viewer. A mining cutting is visible in the left third of the scene. To the right, Slaughter Yard Hill is visible with a cluster of exotic deciduous trees in the foreground. The east escarpment of Water Race Hill (the site) is prominent in the middle of the view and has a largely pastoral land cover on the upper slope with scattered trees and shrubs visible on the lower portion of the slope (not on the site).

Values portrayed by the current scene include rural character and amenity which is associated with the open and unbuilt nature of the hills. The scenic quality relates to the appreciation of the complex topography and a sense of ruggedness imparted by the terrain in combination with the sparse vegetation cover. Further, the hills and terraces contribute to the sense of containment experienced from Bannockburn Inlet.

From this location, the dwellings on lots 5 and 15 – 20 on south end of the escarpment will be visible, although setback from the Inlet. It is anticipated that future dwellings located on these lots will potentially break the skyline when viewed from this location. They will also form a new element in the scene, being the only dwellings visible from this location. Street trees and mitigation planting will also be visible and will partly screen the dwelling on lot 5 while also forming a backdrop to built form on lots 15-20. Earthworks within lots 100 and 101 for the road and the walking track will also be somewhat visible in the short term.

Given that there are no existing dwellings visible from this viewpoint, the close proximity to the site and possibility for a dwelling to break the skyline from this location, I consider the magnitude of change for this view to be moderate. This change will result in a reduction in the rural amenity and scenic quality of this view, through a change to the open and unbuilt nature of the hill and the ruggedness and visual simplicity of the upper pasture due to the introduction of built form and earthworks. I consider that adverse effects on visual amenity will be moderate.

Viewpoint 7



Figure 7: Viewpoint 7 from Bannockburn Recreation Reserve

Viewpoint 7 is from Bannockburn Recreation Reserve, looking in a south westerly direction, approximately 500m from the site. Refer to Sheet 14 of the GA. This viewpoint location is near the shoreline of Bannockburn Inlet. The gully walking track provides direct access to the area, which is positioned below a steep escarpment beyond the site boundary to the east.

Observers from this location will include locals and visitors that are undertaking recreation activities associated with the Inlet and the Lake Dunstan Trail.

The current scene takes in a car park and toilet facilities in the foreground. These are set against the backdrop of Water Race Hill and the lower slopes of Slaughter Yard Hill. Vegetation includes deciduous trees on the flat below the hills and scrub vegetation on the lower slopes of the hills and within the gully between them. A number of slope cuttings from mining activities are visible.

Values portrayed by the current scene include rural character and amenity which is associated with the open and unbuilt nature of the hills. The scenic quality relates to the appreciation of the complex topography and a sense of ruggedness imparted by the terrain in combination with the sparse vegetation cover. Further, the hills and terraces contribute to the sense of containment experienced from Bannockburn Inlet.

Due to proximity and the nature of the topography there are only limited views of the subject site from the Bannockburn Recreation Reserve. From this location, only the dwellings on the end lots on the escarpment (lots 15 – 20) will potentially be visible, however they are set back from the Inlet, and it is anticipated that they will be partly screened by the existing landform and vegetation in the foreground. In addition, proposed mitigation through design controls will help to reduce the visual prominence of these dwellings. Even so, it is expected that future dwellings located on these lots will be partially visible and will potentially break the skyline when viewed from this location. They will also form a new element in the scene, being the only dwellings visible from this location. Mitigation planting and street trees will be somewhat visible and will form a partial backdrop to the built form on lots 15 – 20.

The magnitude of change for this view is considered to be low, based on the small amount of the proposal which will be visible, its setback from the Inlet and the small scale and recessive colour of the built form (as guided by the design controls). This change is likely to result in a small reduction in the rural amenity and scenic quality experienced from this view due to the presence of built form on the hillside. As a result, I consider that adverse effects on visual amenity as experienced from this viewpoint will be low-moderate.

Viewpoint 8



Figure 8: Viewpoint 8 from Patersons Road

Viewpoint 8 is from Patersons Road, looking in a westerly direction, approximately 900 m from the site. Refer to Sheet 14 of the GA.

This viewpoint location is representative of views from public roads and private residences on the east side of the Bannockburn Inlet.

The current scene takes in Patersons Road in the centre of the view, a vineyard the left, and open pasture with beehives and powerlines on the right. The layered landforms of Water Race Hill and

Slaughter Yard Hill sit in the mid-ground with the Carrick Range visible in the background. The cuttings of Bannockburn Sluicings Historic Reserve are visible in the background at the base of the Carrick Range and just above Water Race Hill. Rural dwellings and structures are dotted through the landscape in the mid-ground. Development within Bannockburn is visible just to the left of Water Race Hill, including two dwellings located on the adjacent landform.

Values portrayed in the current scene include working rural character and rural amenity due to the open and largely unbuilt nature of the scene and the prevalence of rural productive activities. Scenic quality is high due to the visibility of the mountain ranges in the distance and the complex layered effects of the terraces, hills, and escarpments in the mid-ground. From this location the site exhibits a visual simplicity due to the smooth slope of the east escarpment and the cohesive landcover.

From this viewpoint location, there will be clear views of lots 15 – 20 on the south end of the escarpment, due to the elevated position of these lots. Roof lines from lots 2 – 6 and 9 – 14 may also be somewhat visible as they are likely to protrude above the edge of the terrace landform. Proposed mitigation planting and street trees will, in time, largely screen the built form within lots 2 – 6 and 9 – 14. The proposed built form will be viewed against a backdrop of foothills and mountain ranges and in the immediate context of existing visible built form to the left (south-west) of the site which includes dwellings within Bannockburn. Earthworks within lots 100 and 101 for the road and the walking track may also be somewhat visible in the short term.

The magnitude of change as experienced from this viewpoint is considered to be low due to the small scale of the proposal in the overall scene. Further, in the context of the existing visible development, the proposed design controls, and mitigation planting, it is likely that the proposal will not contrast significantly with the existing scene and will appear as an extension to existing visible built form. As a result, I consider that adverse effects on visual amenity as experienced from this viewpoint will be low-moderate. This change will result in a small reduction in rural amenity and scenic quality due to the increase in built form on Water Race Hill. It will also contribute to a minor loss in the visual simplicity of the site as perceived from this location.

Viewpoint 9



Figure 9: Viewpoint 9 from Bannockburn Road along the west boundary of the site

Viewpoint 9 is from Bannockburn Road along the west boundary of the site and across the road from Black Rabbit Café and the Bannockburn Hotel. The view is oriented toward the east. Refer to Sheet 15 of the GA.

Observers from this location are likely to include both residents of Bannockburn and tourists visiting the historic centre and travelling along Bannockburn Road.

The subject site makes up most of the view. The foreground of the site is low-lying, open but with scattered vegetation. It is surrounded by a terrace which is punctuated by the central gully, creating a small knoll (left) which separates the site from Slaughter Yard Hill to the north. The gentler slopes up to the terrace are grassed while the exposed rocky faces of the sluice gulch are also visible. Existing modifications are visible in the form of fence lines and heritage features such as the face of the sluice gulch. Existing development is visible to the south-west (right) along Terrace Street where

dwellings are seen perched on top of the terrace above graded and landscaped escarpments which separate them from the low-lying part of the site. These dwellings are set against a backdrop of the Cairnmuir Range mountains, existing vegetation, and, in some instances the sky.

The values portrayed in this scene include a rural character and amenity, associated with the open and pastoral character of the foreground and the unbuilt nature of the terrace landforms in the centre of the scene. Scenic quality is high due to the complex topography, visible sluice gulch, and distant mountains. A sense of ruggedness is imparted by the terrain in combination with the sparse vegetation cover. Further, the terraces and more distant mountains contribute to the sense of containment and separation experienced from Bannockburn township.

It is important to note that the foreground view is zoned Rural and not within the BLR and therefore it is reasonable to suggest that the development from this view could be seen in the context of the site being modified for large lot residential suburban development, Therefore, in this context existing 'rural character' is also 'undeveloped suburban land'.

From this viewpoint, future dwellings on lot 1, 7-13 will be potentially visible, rooflines of dwellings on lots 2 – 6 may also be partially visible. These dwellings are, for the most part, not in breach of the BLR so could be reasonably anticipated based on the underlying zoning. This built form will be set back from Bannockburn Road, maintaining the open and pastoral character of the low-lying area in the foreground within a balance lot.

While there is limited visibility of the lots within the BLR (4, 5, 6, 12, 13, 14, and 15 to 20), in any case where seen they will be viewed across/beyond permitted development anticipated to be built in the eastern part of the site adjacent to Bannockburn Road.

The magnitude of change anticipated will be moderate given the proximity to the proposed built form and the extent of development visible in the overall the scene. However, the proposed built form will be visible in the context of similar development and will likely appear as an extension to the existing development on Terrace Street. This change will constitute a minor reduction in the rural amenity and scenic quality of the site as perceived from Bannockburn Road, however the openness and rural amenity in the foreground will be maintained. As a result, I consider that adverse effects on visual amenity as experienced from this viewpoint will be low-moderate.

Viewpoint 10



Figure 10: Viewpoint 10 from the east terminus of Terrace Street

Viewpoint 10 is from the end of Terrace Street along the west boundary of the site. The view is oriented toward the east. Refer to Sheet 15 of the GA.

Observers from this location are likely to include residents of Bannockburn, primarily residents of dwellings along Terrace Street and those living within the proposed subdivision. It is also considered to be somewhat representative of the outlook experienced from existing residences near the end of Terrace Street.

The subject site takes up the foreground of the view with the Cairnmuir Range visible in the background. The foreground includes the current terminus of Terrace Street, a driveway on the right which is over an easement on the site, and a farm track leading into the site in middle of the scene. Vegetation is sparse with and given the unfenced nature of the site boundary, appears to be disused pasture with a number of weed species prevalent. Scattered shrubs are notable in the left side of the scene and Slaughter Yard Hill is visible in the distance to the north.

The values portrayed by the current scene include a working rural character and generic rural amenity. Views to Cairnmuir Range and Slaughter Yard Hill contribute to the overall scenic quality of the view.

From this viewpoint it is anticipated that the scene will be notably changed as it will encompass a view directly into the new subdivision looking down the main road (extension of Terrace Street) with new dwellings on either side of the street. It is anticipated that lot 1 will be visible in the foreground taking up a considerable portion of the view on the left side of the scene with lots 7, 8, 10, 11, and 12 visible along the same side of the road in the mid-ground. Lots 1, 4, and 5 will be visible on the right side of the scene along the main road. These dwellings are, for the most part, not in breach of the BLR so could be reasonably anticipated based on the underlying zoning.

The character of the scene will be changed from a working rural character to a residential character, similar to what is experienced along Terrace Street leading up to this view. Thus, the magnitude of change is anticipated to be high. It is likely that this change will detract from the generic rural amenity, however it is also important to keep in mind the underlying zoning as there is a reasonable expectation that this change could occur and therefore effects are not necessarily adverse.

With regard to scenic quality, it is anticipated that views to the Cairnmuir Range and Slaughter Yard Hill will be potentially impacted due to built form in the foreground, as a result it is anticipated that adverse effects on scenic quality will be low-moderate. However, there are also potential positive effects to be experienced from this viewpoint through the increased amenity of a pleasant streetscape and built form of a scale and style which complements the existing residential character of Bannockburn. As a result, I consider it likely that positive effects on the overall visual amenity of the scene will be moderate-high.

Viewpoint 11



Figure 11: Viewpoint 11 from the east terminus of Terrace Street

Viewpoint 11 is from Terrace Street and is oriented toward the east. This viewpoint is located at a distance of approximately 200 m from the site. Refer to Sheet 15 of the GA.

Observers from this location are likely to include residents of Bannockburn, primarily residents of and visitors to dwellings along Terrace Street, those living within the proposed subdivision, and people travelling to the proposed reserve. It is also considered to be somewhat representative of the outlook experienced from existing residences near the end of Terrace Street.

The subject site is somewhat visible at the terminus of Terrace Street in the centre-left of the scene. Along both sides of Terrace Street there are a number of dwellings visible, mostly single storey but some also being two storeys. The street interface has more of a rural rather than urban character, being without kerb and channel and being lined with post and rail fencing, lawn, and plantings. In places, the roadside plantings somewhat screen the built form beyond. Gravel driveways and mailboxes are also present. Vehicles are parked both on the side of the road and on the grassed verge. In the distance, the mountains of the Cairnmuir Range are visible.

The overall scene portrays a residential character and derives its scenic amenity from the mountains in the distance.

From this viewpoint, it is anticipated that built form on lots 1, 3, 4, 5, 7 and 10 may be partly visible. These dwellings are, for the most part, not in breach of the BLR so could be reasonably anticipated based on the underlying zoning.

As the new built form only takes up a small portion of the scene and is viewed in the context of existing similar development, I anticipate the magnitude of change to be low. The built form is anticipated based on the underlying zoning and it is also expected that the built form will be in keeping with the existing form and character of development along Terrace Street. Therefore, I consider adverse effects as experienced from this viewpoint will be negligible. The rural residential character of the scene will be maintained, as will the scenic quality of the mountains in the distance.

Visual Effects Summary

The effects of the proposal on the existing visual amenity will extend beyond the site but are relatively contained. The more distant views (Viewpoints 1 & 2) will be viewed against a vast and complex landscape, making the proposed development difficult to discern and result in adverse effects from negligible to very low. Views near to the site from the east, from around the Bannockburn Inlet, Cairnmuir Road and the surrounding rural environment (Viewpoints 3-8) are most relevant and potentially most impacted, as demonstrated from the key viewpoints identified, adverse effects from viewpoints in this area range from low-moderate to moderate. Views from Bannockburn township to the west of the site (Viewpoints 9-11), while also impacted, portray a different character given the existence of residential built form in the context, resulting in effects from negligible to low-moderate. As a result, I consider that the effects on visual amenity overall are low-moderate and consider this degree of effects to be appropriate in the context.

Night-time Lighting Effects

I have reviewed the Landpro 'Preliminary Servicing Plan', and it is my understanding an extension of street lighting down Terrace Street is proposed to continue in a similar manner until reaching the Building Line Restriction. Where beyond the BLR, it is proposed that bollard style lighting is implemented to minimise the impact on local residents and those viewing the area from outside the development at night time.

As I understand, streetlighting is only recommended in the transportation assessment, so the bollard lighting should be considered an optional inclusion and not necessarily a stringent condition applied to this consent. In saying that bollard lighting (say no more than 1.0m in height) can be relatively easily designed in a way to minimise light spill upwards and outwards.

Generally lighting will be seen in the context of the extisting Terrace Street lighting. Selection and approval of such products is a matter for engineering approval. Further to this, it is my understanding that the technology around lighting has experienced considerable advances over recent years and

is constantly undergoing further study. In highly sensitive areas such as designated ‘Dark Sky’ reserves, controls on light emissions have been successful in reducing both light pollution but also preserving the dark sky experience.

Building on these precedents, a number of Dark Sky approved products are available. I am familiar with these having undertaken work within Tekapo over the last 15 or so years. Overall, I consider that any potential broader adverse night-time effects can be appropriately managed.

6.0 Assessment Against Statutory Provisions

6.1 Statutory Assessment

The relevant statutory documents have been previously identified in Section 3 of this report. The following provides an assessment of the proposal against the specific rules, objectives and policies with regard to landscape and visual amenity matters.

12.7.7 Building Line Restriction

Given the recent history of development in Bannockburn which has seen dwellings built along the south eastern side of Terrace St resulting in built form visible on the ridgeline, it is reasonable to conclude that landscape change arising from the proposed development within the BLR is not a 'new' proposition in terms of visibility of built form in this part of Bannockburn. Therefore, while there is no development approved in the BLR, dwellings already present within the immediate setting suggests that there is potential for the landscape to absorb some development beyond the BLR within this location.

The sensitivity of the subject site partially within the BLR overlay has required careful design of the subdivision proposal, including a reduction in the number of lots proposed within the BLR in this application. In the current proposal lots located within the BLR are generally viewed in the context of other existing built form and will appear as an extension of built form along Terrace Street. The recommended design controls including building platforms, height limits, planting mitigation and rules regarding materials and colour will ensure that the proposed built form within the BLR can be absorbed and effects largely mitigated when viewed in the context of adjacent development.

There are however some exceptions to this, as demonstrated by the viewpoints immediately around the Bannockburn Inlet, from which built form may be perceived as a spill over from Bannockburn township and form a new element in the scene. From these viewpoints, as described previously, the breach of the BLR will contribute to adverse effects, ranging from low-moderate to moderate. This change will result in a reduction in the rural amenity and scenic quality of these views, through a change to the open and unbuilt nature of the hill and the ruggedness and visual simplicity of the escarpment above the inlet due to the introduction of built form.

7.1.1 Objective – Maintenance of Residential Character

Given the current zoning within the CODP, it is accepted that the landscape of the subject site has the capacity to be developed in line with the provisions for RRA (4). The proposed lot sizes comply with the minimum size as set out in the provisions for RRA (4) and are also consistent with existing development adjacent to the site on Terrace Street. As a result, I consider the character of the built form resulting from the development will be consistent with the existing residential character of adjacent development and Bannockburn township. While the rural outlook of adjacent properties will change, I consider this to be acceptable given the underlying zoning which will anticipates and will promote a residential character within the subject site. Further, the subdivision will result in positive effects on residential amenity and character of the site through a well-designed streetscape and street tree plantings, as well as the provision for a reserve and walking tracks.

7.1.2 Objective – Protection of Living Environment

As stated above, the proposal can be reasonably anticipated given the underlying zoning and is a continuation of existing residential development along Terrace Street. The resulting character of the

proposed development will be a residential character which will be consistent with the existing character of adjacent development and will maintain a pleasant living environment. As noted previously, it is anticipated that the proposal will result in positive effects on the living environment of the site, which will potentially extend to the living environment of Terrace Street and the wider community through provision for a reserve and walking tracks, as well as the general amenity created by the streetscape and plantings within the proposed subdivision.

7.1.3 Objective – Management of Change

As stated above, the proposal can be reasonably anticipated given the underlying ODP zoning. As the proposal is consistent with the RRA (4) rules and the scale and form of adjacent development I do not consider the proposed change to be at odds with the surrounding environment. The exception being built form which breaches the BLR, as discussed in the context of Rule 12.7.7. However, on the whole, the development can be readily absorbed by the surrounding environment.

7.2.1 Policy – Residential Character

The proposal will not adversely effect the character and amenity values of the existing residential areas in regard to glare (c) as design controls have been recommended regarding materials and colour to ensure buildings are recessive in the landscape. Regarding structures at the street frontages (d), no such structures have been included in this proposal. Regarding privacy and access to sunlight (e), future dwellings will have finished floor levels at a similar elevation or below adjacent existing dwellings (based on existing natural grades); paired with design controls for building heights, this will ensure that privacy and sunlight access are not compromised for properties adjacent to the proposal. In regard to visual amenity effects due to signage, hard stand surface or good / waste storage (f), no such elements have been included in the proposal.

7.2.2 Policy – Amenity Values

As stated above, the amenity values of residential sites, specifically privacy and access to daylight / sunlight will not be compromised as a result of the proposal, as future dwellings will have finished floor levels at a similar elevation or below adjacent existing dwellings (based on existing natural grades) as well as height controls. It is likely that the proposal will change the outlook from properties at the end of Terrace Street, however, this change could be somewhat anticipated given the underlying zoning.

7.2.3 Policy – Environmental Quality

I consider it likely that the proposal will have positive outcomes for the environmental quality of the site through the designation of a public reserve and the balance lots which will maintain the openness and naturalness of this area and provision for walking tracks for the enjoyment of the wider community. Further, there is potential for weed control, pest management and native revegetation which would improve the ecological quality of the subject site and the vested reserve.

7.2.4 Policy – Recreation Activities

A significant positive outcome from the proposal is the allocation of lot 30 as a vested public reserve and provision of walking tracks through lots 40, 51, and 50. This is to provide opportunities for recreation and ensure long term connectivity to Bannockburn Inlet for all Bannockburn residents.

7.2.5 Policy – Open Space

The proposal will maintain the amenity value of open space through the proposed public reserve and Lot 40 which will maintain open space within the majority of the BLR and adjacent to Bannockburn Inlet. As described in the Visual Effects sections of this report, it is anticipated that some adverse effects on the openness of the site and escarpment will be experienced from specific viewpoints, particularly around the Bannockburn Inlet.

Open space will also be retained within the balance lot adjacent to Bannockburn Road which will preserve the open and rural character experienced from Bannockburn historic township. Again, it is anticipated that from certain viewpoints, the visibility of built form will somewhat reduce the open nature of the site, but this change is somewhat anticipated given the underlying zoning.

7.2.7 Policy – Residential Resource Areas (1) – (13)

While the proposal constitutes an extension of the semi-urban form of Bannockburn, this change can be anticipated based on the ODP and the proposal seeks to maintain the specific characteristics of Bannockburn and the wider receiving environment through adherence to the RRA (4) minimum lot size and design controls to ensure built form is in keeping with the local vernacular, as well as protection of open space and recreation amenity through the designation of a public reserve and maintenance of an open and rural outlook from Bannockburn Road.

16.3.4 Objective – Amenity Values

The revised proposal includes a reduced lot configuration of 20 residential lots, designated building platform, building height restrictions, mitigation planting and design guidelines to minimise potential adverse effects on the open and natural character of the surrounding landscape and water bodies. While the natural and open character of the site itself will be reduced, the proposed development is in keeping with existing surrounding development and has been sensitively designed to minimise potential adverse effects on the open and natural character of the receiving environment.

Regarding the adjacent Bannockburn Inlet, the proposed 20 lot layout which includes a reduced number of lots within the BLR will ensure that development is set back from the water and will not have unacceptable adverse effects on the natural character of the Inlet.

16.3.6 Objective – Heritage Values

The layout of the proposed subdivision acknowledges and seeks to maintain where possible the heritage values of the subject site. The Kopuwai Consulting report provides further recommendations to ensure these values are retained.

16.3.7 Objective – Open Space, Recreation and Reserves

A significant positive outcome from the proposal is the allocation of Lot 30 as a vested public reserve and Lot 40 as a balance lot to be retained for rural activities or ecological enhancement. This is also to provide opportunities for recreation and, paired with Lots 50 and 51 (balance lots) will ensure long term connectivity to Bannockburn Inlet for all Bannockburn residents.

16.3.8 Objective – Public Access

Through the allocation of Lot 30 as a vested public reserve and the balance lots, the proposal will enhance public access to the Bannockburn Inlet (a), to public open space (b) and to sites of heritage and cultural values (c) which are being preserved within the road reserve and public reserve as part of the proposal.

16.4.7 Policy – Subdivision Design

In regard to the landscape and visual matters of policy 16.4.7, the proposed subdivision includes allocation of open space as a reserve for public use and access, improving physical links from Bannockburn to the Bannockburn Inlet (e)(f). The proposal also facilitates retention of heritage values of the site by incorporating heritage features into the road reserve and public reserve (h). The proposal will require earthworks for establishment of the road network, driveways and building platforms, however this is to be kept to a minimum by incorporating shared driveways for lots 15 – 20, building platforms of 500m2 (reduced from 750m2 in the original application) and guidelines regarding the design of built form, such as encouraging built form to be stepped to follow the terrain.

PC19 - Large Lot Residential Zone

In the context of the PC19 zoning I note that the Large Lot Residential Zone (LLRZ) is described as follows:

'The Large Lot Residential Zone is located in some of the outer residential areas within the townships of Alexandra, Clyde and Cromwell, as well as Bannockburn, Lowburn and Roxburgh. The density within this zone is the lowest of all residential zones, providing for detached dwellings on large sites and maintaining a high open space to built form ratio'.

Given that most of the allotments created by the proposed subdivision are less than the permitted 2000m² in area as per LLRZ-S1 – Density *(1. The minimum site area per residential unit is 2000m²)* I make comment in regard to the following objectives and policies.

LLRZ-O1 Purpose of the Large Lot Residential Zone

LLRZ-O2 Character and amenity values of the Large Lot Residential Zone

LLRZ-P1 Built Form

In response to the above objectives and policy, I consider that in the context of the Site, there is a capacity for a development that has smaller lot size than that anticipated by PC19. This will still result in '*a pleasant, low-density living environment',* that maintains a predominance of open space over built form. In my opinion, that despite a slightly smaller lot size, it will read as a development that is well-connected with the surrounding area including Terrace Street.

More importantly from a landscape planning perspective, there are several topographical and heritage constraints that result in areas of the Site that are not well suited for development. The proposed subdivision provides for a creative response to these constraints and the opportunity for the protection of the topographical and heritage features. It is considered an integrated subdivision proposal that is sympathetic to the landscape context.

Despite these constraints, the Site represents a strategic location for a divergence from the proposed zoning of PC19. In a nutshell, the built form and landscape outcome resulting from this proposed subdivision, when compared to that of the PC19 approach, will from an urban form, landscape and amenity perspective result in an appropriate outcome for the Site.

It is considered that the proposed lot sizes will still deliver a high level of spaciousness around future buildings, especially in the context of the lots that are set aside for open space and reserves. These

lots generally align with the key heritage elements to be maintained and acknowledged. Within this setting future built form will appear modest in scale and of an intensity, and will sit comfortably within the context of the Bannockburn settlement.

7.0 Conclusion

The development envisaged by this subdivision proposal carries and builds upon the existing development along Terrace Street. Therefore, one needs to consider that landscape effects will be in the context of this adjacent, and, in places, recent residential development. Given the recommended design controls and guidelines, it is considered the nature and scale of a revised 20 lot proposal will better align with and not degrade or erode the overall landscape values and landscape character of the receiving environment, ensuring the unique character, sense of place, and heritage values of the site and surrounding environment are acknowledged and maintained.

The effects of the proposal on the existing visual amenity will extend beyond the site but are relatively contained. The more distant views (Viewpoints 1 & 2) will be viewed against a vast and complex landscape, making the proposed development difficult to discern and result in adverse effects from negligible to very low. Views near to the site from the east, from around the Bannockburn Inlet, Cairnmuir Road and the surrounding rural environment (Viewpoints 3-8) are most relevant and potentially most impacted, as demonstrated from the key viewpoints identified, adverse effects from viewpoints in this area range from low-moderate to moderate.

Views from Bannockburn township to the west of the site (Viewpoints 9-11), while also impacted, portray a different character given the existence of residential built form in the context, resulting in effects from negligible to low-moderate. In these views the proposed development will be viewed in the context of the site, in the foreground, being modified for residential suburban development Therefore, in this context existing ‘rural character’ is also ‘undeveloped suburban land’. As a result, I consider that the effects on visual amenity overall are low-moderate (at most) and consider this degree of effect to be appropriate in the context.

It is considered that potential adverse landscape effects arising from a smaller lot size than anticipated by LLRZ, will be appropriately mitigated, as the nature and scale of the revised development will maintain the landscape values and character of the Cromwell Basin. Overall, I consider that proposed subdivision, including the bespoke controls and design conditions from a landscape perspective responds appropriately to the Site’s attributes, sensitivity, and the surrounding environment.

8.0 Appendix A: Proposed Plant List

Street Trees

Liquidambar styraciflua 'Worplesdon'	Sweet Gum
Quercus robur 'Fastigiata'	Upright Oak
Liriodendron tulipifera 'Fastigiata'	Upright Tulip Tree

Reserve Trees

Cordyline australis	Cabbage Tree
Plagianthus regius	Ribbonwood
Populus 'Crow's Nest'	Lombardy Poplar
Quercus rubra	Red Oak
Sophora microphylla	Kowhai

Plant Mix 1: Mitigation Planting & Screening

Coprosma propinqua	Mingimingi
Kunzea serrotina	Kanuka
Leptospermum scoparium	Manuka

Plant Mix 2: Amenity Planting within Road Reserves

Chionochloa rubra	Red Tussock
Coprosma acerosa 'Hawera'	Groundcover Coprosma
Festuca novae-zelandiae	Hard Tussock
Hebe cupressoides 'Nana'	Dwarf Evergreen Hebe
Lavandula spp.	Lavender
Libertia spp.	NZ Iris
Muehlenbeckia axillaris	Creeping Wire Vine
Phormium cookianum	Mountain Flax
Poa cita	Silver Tussock
Thymus serpyllum	Wild Thyme

Plant Mix 3: Private Lot Amenity Planting within Building Platforms*

Chionochloa flavicans	Dwarf Toe
Chionochloa rubra	Red Tussock
Coprosma acerosa 'Hawera'	Groundcover Coprosma
Coprosma propinqua	Mingimingi
Cordyline australis	Cabbage Tree
Corokia 'Geenty's Green'	Green Corokia
Corokia 'Bronze King'	Bronze Corokia
Festuca novae-zelandiae	Hard Tussock
Hebe cupressoides 'Nana'	Dwarf Evergreen Hebe
Kunzea serrotina	Kanuka
Leptospermum scoparium	Manuka
Lavandula spp.	Lavender
Libertia spp.	NZ Iris
Muehlenbeckia astonii	Shrubby Tororaro
Muehlenbeckia axillaris	Creeping Wire Vine
Olearia odorata	Scented Tree Daisy
Pachystegia spp.	Marlborough Rock Daisy
Phormium cookianum	Mountain Flax
Pittosporum 'Stephens Island'	NZ Pittosporum

Plagianthus regius	Ribbonwood
Poa cita	Silver Tussock
Pseudopanax crassifolius	Lancewood
Rudbeckia spp.	Coneflower
Sedum spp.	Sedum
Sophora microphylla	Kowhai
Thymus serpyllum	Wild Thyme

*In addition to the above list, fruiting orchard trees and olive trees are also permitted.

Plant Mix 4: Private Lot Revegetation Planting outside Building Platforms

Coprosma virescens	
Corokia cotoneaster	Korokio
Festuca novae-zelandiae	Hard Tussock
Kunzea serrotina	Kanuka
Melicytus alpinus	Porcupine Shrub
Poa cita	Silver Tussock
Thymus serpyllum	Wild Thyme

Plant Mix 5: Open Space Reserve Revegetation Planting

Aciphylla aurea	Golden Spaniard
Coprosma propinqua	Minigmingi
Coprosma virescens	
Corokia cotoneaster	Korokio
Festuca novae-zelandiae	Hard Tussock
Kunzea serrotina	Kanuka
Melicytus alpinus	Porcupine Shrub
Ozothamnus leptophylla	Mountain Cottonwood
Poa cita	Silver Tussock
Thymus serpyllum	Wild Thyme

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REV	DATE	NOTES

50
7.82Ha

1
1510m²

2
1502m²

3
1526m²

4
2266m²

5
1704m²

6
1502m²

7
2038m²

8
1910m²

9
1562m²

10
1522m²

11
1518m²

12
1658m²

13
1597m²

14
1544m²

15
1820m²

16
1771m²

17
1745m²

18
1743m²

19
1770m²

20
1720m²

30
0.44 Ha

40
4.44 Ha

51
0.53 Ha

100
0.11 Ha

0 50 100 150 200 250 m

NORTH

Draft

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MASTER PLAN - 20 LOT OPTION
BANNOCKBURN SUBDIVISION
LOT 4 DP 339137
TERRACE STREET

JOB No.	20026
SCALE	1:1000 @ A1
DATE	11/07/2023
DESIGNED	AN
DRAWN	AN
CHECKED	TM
STATUS	DRAFT
DRAWING No.	REVISION
L1.0	
SERIES	
5 of 1	

RMM

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Proposed Subdivision - Terrace Street, Bannockburn
Graphic Attachment to Landscape & Visual Assessment

15 January 2024

Document Information

Project

Proposed Subdivision

Address

Terrace Street, Bannockburn, Otago

Client

Searell Jones Family Trusts

Document

Graphic Attachment to Landscape and Visual Assessment

Status

For Review

Revision

0 For Review 15.01.2024

Prepared By

Rough Milne Mitchell Landscape Architects Ltd

Project Number: 20026

Author: Angie Nelson

Peer Reviewed: Tony Milne

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Regional Context Plan



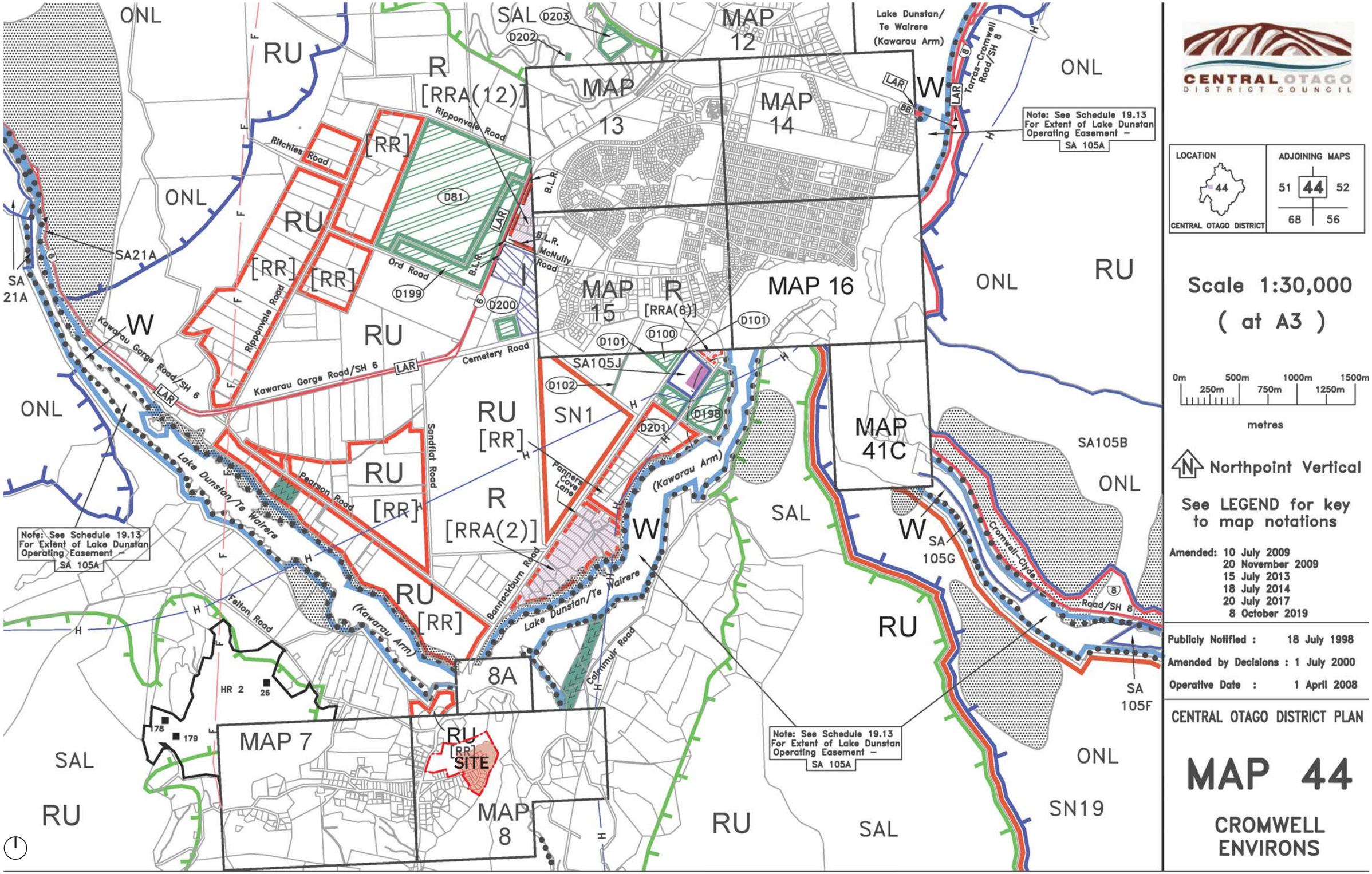
Legend

- Subdivision Site
- Overall Property Boundary

Scale: 1:45,000 @ A3

Aerial Image - Land Information New Zealand (LINZ)

Central Otago District Planning Map 44



0 2000 3000 4000 5000 m

CENTRAL OTAGO DISTRICT COUNCIL

LOCATION

ADJOINING MAPS

51 | 44 | 52

68 | 56

Scale 1:30,000 (at A3)

0m 250m 500m 750m 1000m 1250m 1500m

metres

Northpoint Vertical

See LEGEND for key to map notations

Amended: 10 July 2009
20 November 2009
15 July 2013
18 July 2014
20 July 2017
8 October 2019

Publicly Notified : 18 July 1998

Amended by Decisions : 1 July 2000

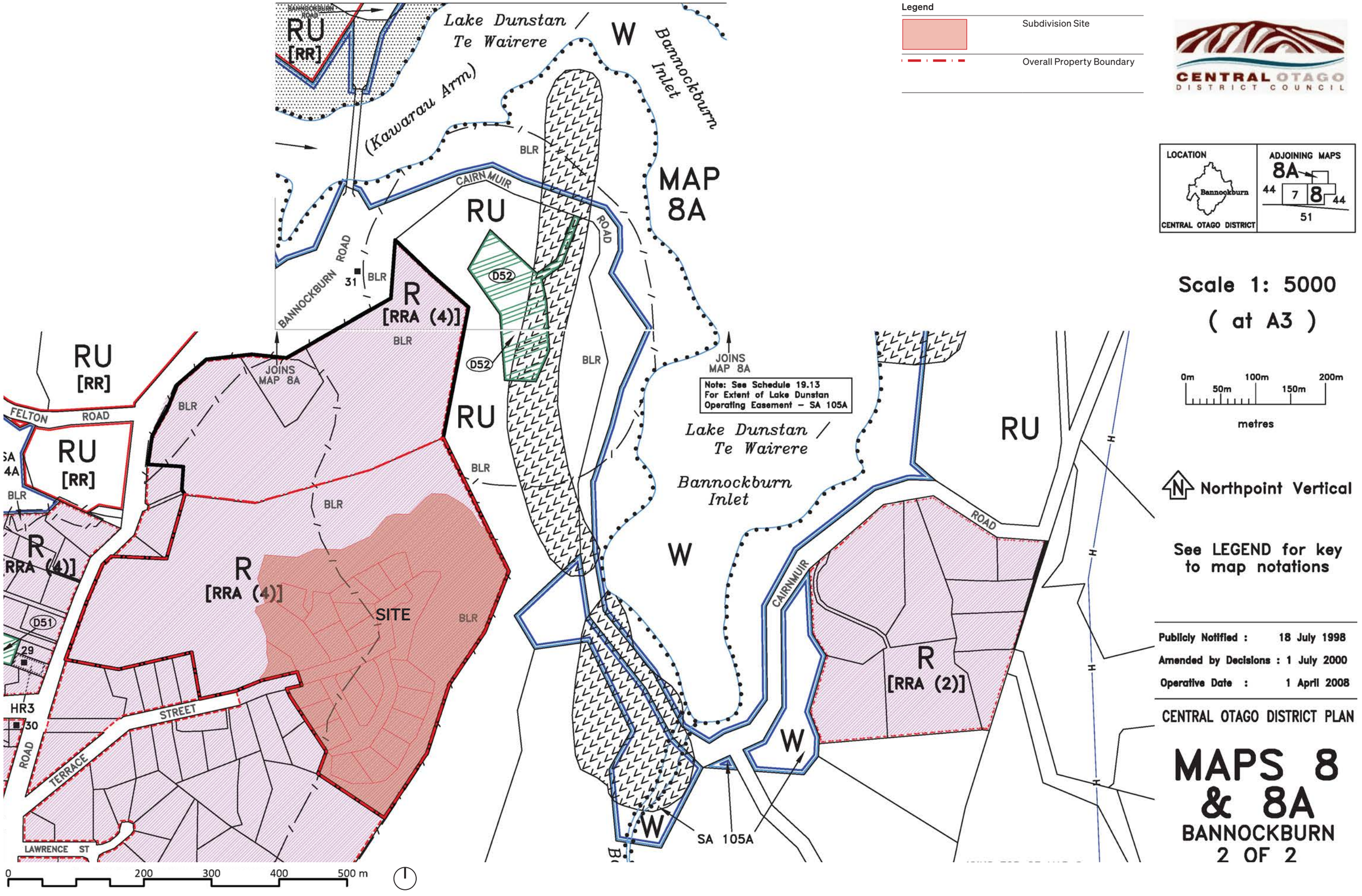
Operative Date : 1 April 2008

CENTRAL OTAGO DISTRICT PLAN

MAP 44

CROMWELL ENVIRONS

Central Otago District Planning Map 8 +8a (Bannockburn)



Legend

- Subdivision Site
- Overall Property Boundary

CENTRAL OTAGO DISTRICT COUNCIL

LOCATION

CENTRAL OTAGO DISTRICT

ADJOINING MAPS

Scale 1: 5000

(at A3)

0m 50m 100m 150m 200m

metres

Northpoint Vertical

See LEGEND for key to map notations

Publicly Notified :	18 July 1998
Amended by Decisions :	1 July 2000
Operative Date :	1 April 2008

CENTRAL OTAGO DISTRICT PLAN

MAPS 8 & 8A

BANNOCKBURN

2 OF 2

Site and Surronds



Legend

- Subdivision Site
- Overall Property Boundary

Scale: 1:7,000 @ A3

Aerial Image - Land Information New Zealand (LINZ)

Site Topography

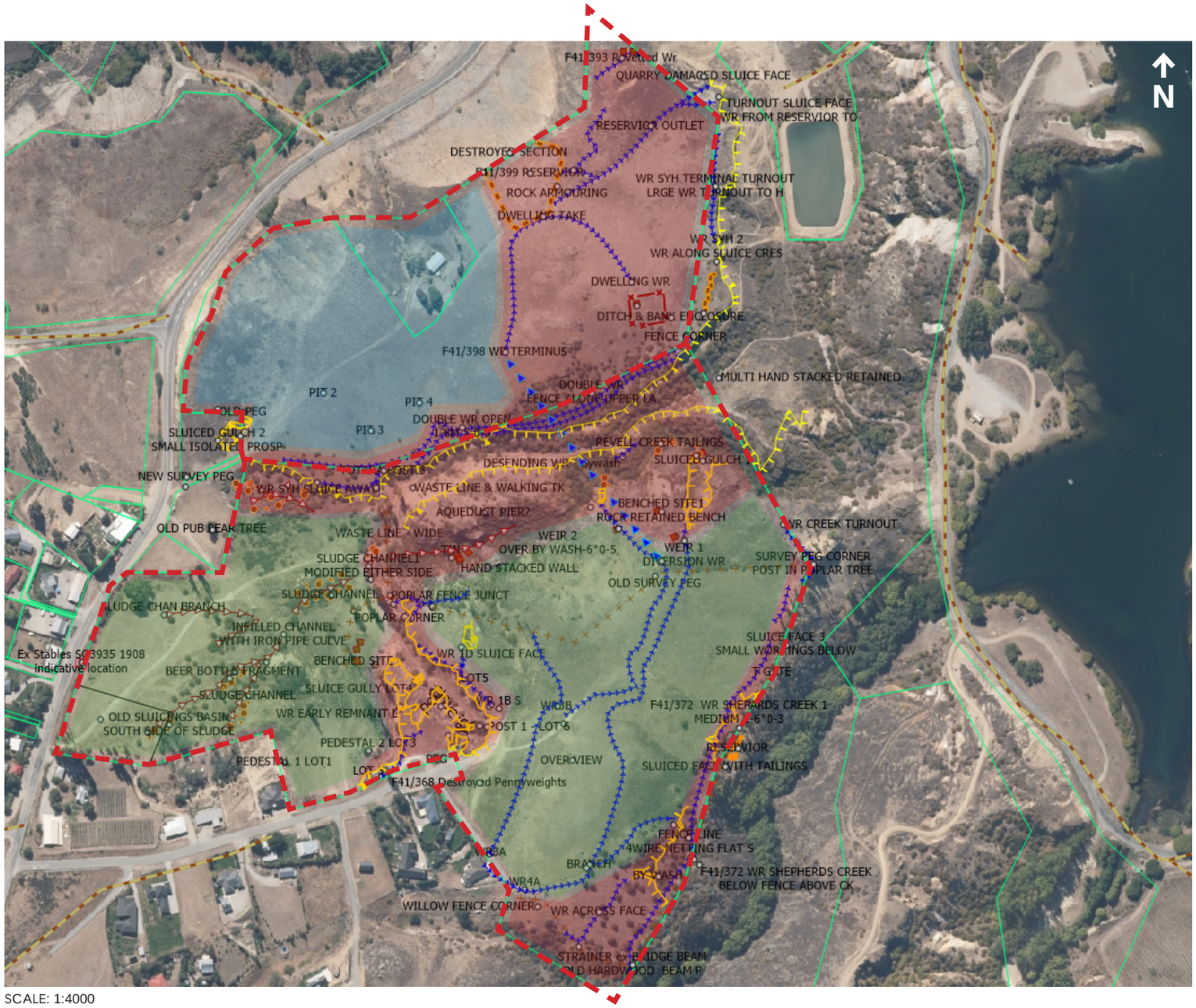


0 200 300 400 500 m

Scale: 1:3,500 @ A3

Aerial Image - Land Information New Zealand (LINZ)

Archaeological and Historical Features Plan



SCALE: 1:4000

Site Boundaries

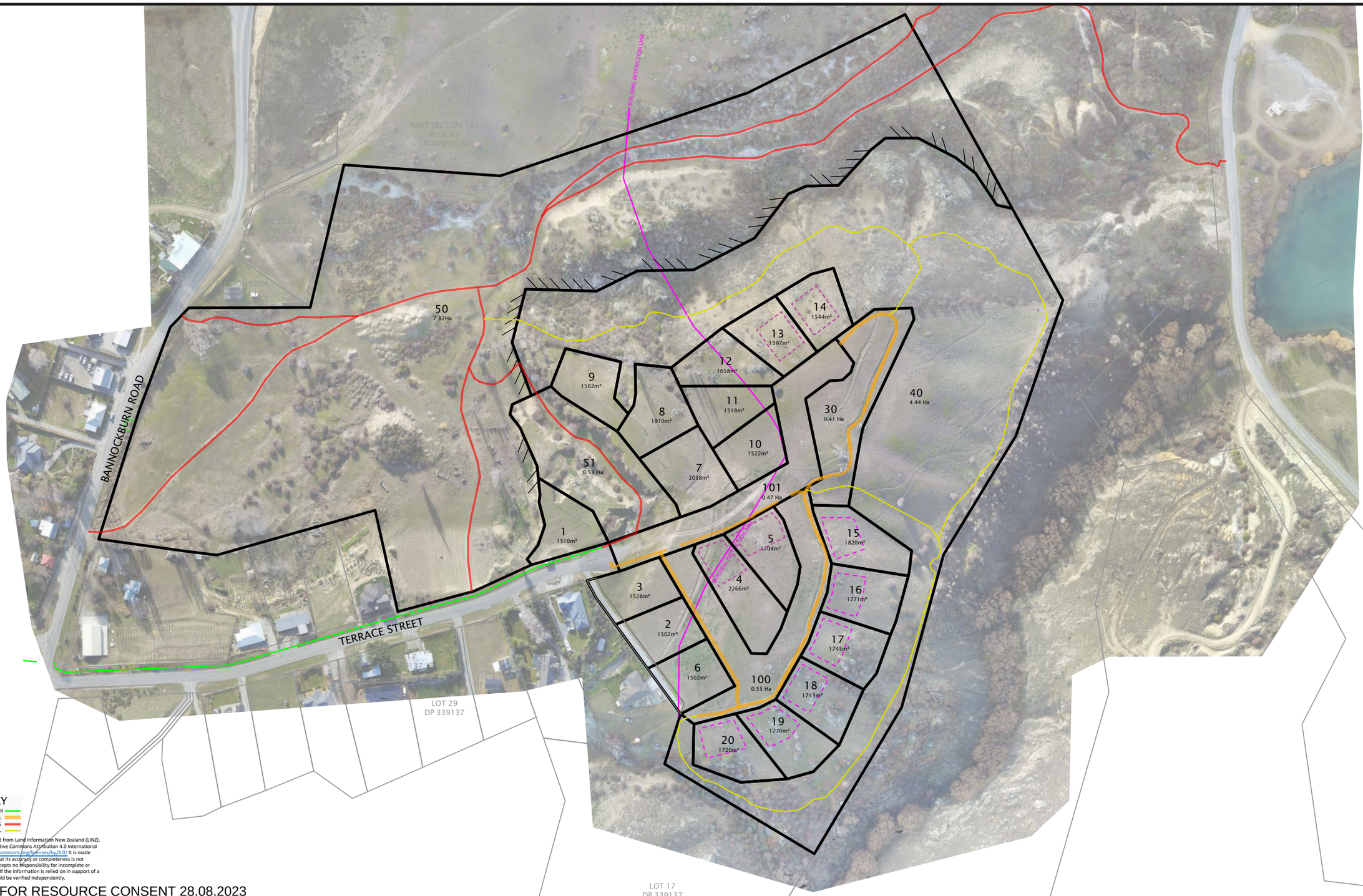
Areas where archaeological features could be integrated into development

Little or no archaeological features

Archaeological features that will constrain or potentially preclude development due to high value, quantity present or type

Map and data provided by Matthew Sole of Kopuwai Consulting

Proposed Subdivision Master Plan



TRACK KEY
- ASPHALT FOOTPATH
- NZCT G 1/2 GRAVEL
- INFORMAL EXISTING
- SINGLETRACK TRAIL

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ISSUED FOR RESOURCE CONSENT 28.08.2023

D:\DATA L - Local working\2021\Terrace Street\S15303.RC2_01_Rev_C.dwg Plotted: 28.08.2023

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OVERVIEW: LOTS 1 - 20, 30, 40, 50, 51, 100 & 101 BEING PROPOSED SUBDIVISION OF LOT 4 DP 339137 TERRACE STREET, BANNOCKBURN

Rev.	Date	Revision Details	By
A	16.11.22	ADD BLR	RAF
B	11.04.23	LOT 200 SPLIT INTO LOTS 30, 40 & 51	RAF
C	25.08.23	ISSUE FOR CONSENT APPLICATION	RAF

Surveyed	Signed	Date	Job No.	Drawing No.
DRONE		SEP 16	S15303	RC2_01
Drawn	**Signed**	**Date**	**Scale**	
RAF		19.07.22	1:1,250 @ A1 1:2500 @ A3	
Designed	**Signed**	**Date**	**Datum & Level**	**Rev.**
RAF		12.07.22	NZTM 2000 & MSL	C

SUBJECT TO RESOURCE CONSENT

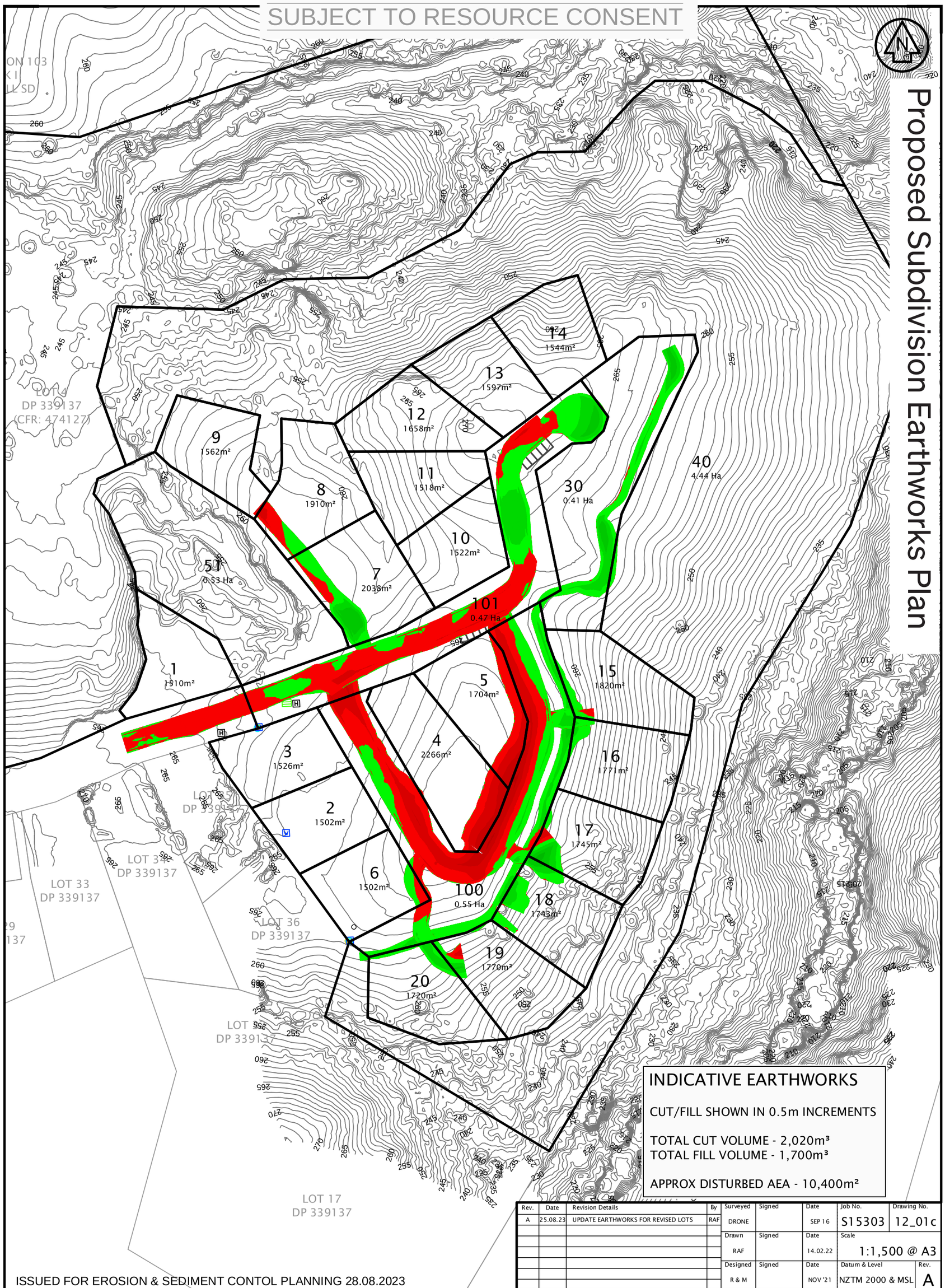
Proposed Subdivision Earthworks Plan

RMM

Proposed Subdivision

Terrace Street, Bannockburn

10



INDICATIVE EARTHWORKS

CUT/FILL SHOWN IN 0.5m INCREMENTS

TOTAL CUT VOLUME - 2,020m³
TOTAL FILL VOLUME - 1,700m³

APPROX DISTURBED AEA - 10,400m²

Rev.	Date	Revision Details	By
A	25.08.23	UPDATE EARTHWORKS FOR REVISED LOTS	RAF

Surveyed	Signed	Date	Job No.	Drawing No.	
DRONE		SEP 16	S15303	12_01c	
Drawn	Signed	Date	Scale		
RAF		14.02.22	1:1,500 @ A3		
Designed	Signed	Date	Datum & Level	Rev.	
R & M		NOV '21	NZTM 2000 & MSL	A	

ISSUED FOR EROSION & SEDIMENT CONTOL PLANNING 28.08.2023

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INDICATIVE EARTHWORKS PLAN
PROPOSED SUBDIVISION OF LOT 4 DP 339137
TERRACE STREET, BANNOCKBURN

D:\DATA L - Local working\2021\Terrace Street\S15303.12.EWK.dwg Plotted: 28.08.2023

Proposed Subdivision Landscape Plan

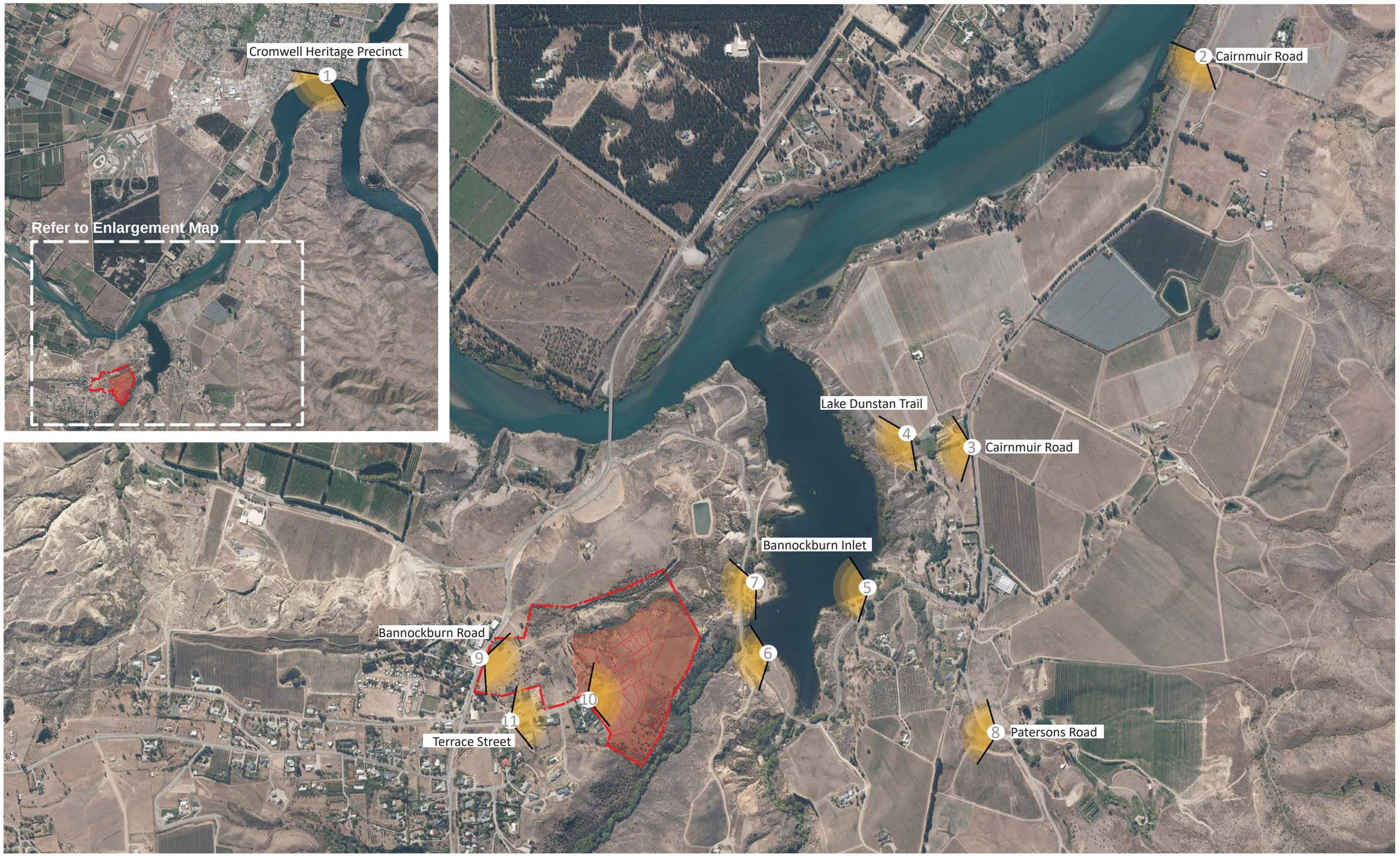


Legend

- Rezoning Site
- Overall Property Boundary
- Building Line Restriction
- Residential Lot
- Building Platform
- Road Reserve
- Private Reserve
- Balance Lot
- Easement
- Road
- Proposed Paths
- Car Parking
- Proposed Mitigation Planting
- Street Trees Type 1
- Street Trees Type 2

Scale: 1:2,500 @ A3

Viewpoint Locations Map



Scale:
Inset Map 1:50,000 @ A3
Enlargement Map 1:10,000 @ A3

Land Information New Zealand etc.

Viewpoint Photographs



Viewpoint Photograph 1: Cromwell Heritage Precinct
Date: 09 July 2020
Time: Between 11:00 and 13:00
Camera: Canon EOS 7D Mark II 30mm Focal Length



Viewpoint Photograph 2: Cairnmuir Road
Date: 09 July 2020
Time: Between 13:00 and 15:00
Camera: Canon EOS 7D Mark II 30mm Focal Length

Viewpoint Photographs



Viewpoint Photograph 3: Cairnmuir Road
Date: 04 August 2020
Time: Between 9:00 and 11:00
Camera: Olympus Digital Camera



Viewpoint Photograph 4: Lake Dunstan Trail
Date: 11 November 2021
Time: Between 10:00 and 12:00
Camera: iPhone

Viewpoint Photographs



Viewpoint Photograph 5: Bannockburn Inlet
Date: 09 July 2020
Time: Between 13:00 and 15:00
Camera: Canon EOS 7D Mark II 30mm Focal Length



Viewpoint Photograph 6: Bannockburn Inlet Recreation Reserve
Date: 04 August 2020
Time: Between 9:00 and 11:00
Camera: Olympus Digital Camera

Viewpoint Photographs



Viewpoint Photograph 7: Bannockburn Inlet Recreation Reserve
Date: 09 July 2020
Time: Between 13:00 and 15:00
Camera: Canon EOS 7D Mark II 30mm Focal Length



Viewpoint Photograph 8: Patersons Road
Date: 04 August 2020
Time: Between 9:00 and 11:00
Camera: Olympus Digital Camera

Viewpoint Photographs



Viewpoint Photograph 9: Bannockburn Road
Date: 18 March 2022
Time: Between 10:00 and 12:00
Camera: Olympus Digital Camera



Viewpoint Photograph 10: Terrace Street
Date: 10 April 2022
Time: Between 13:00 and 15:00
Camera: Olympus Digital Camera

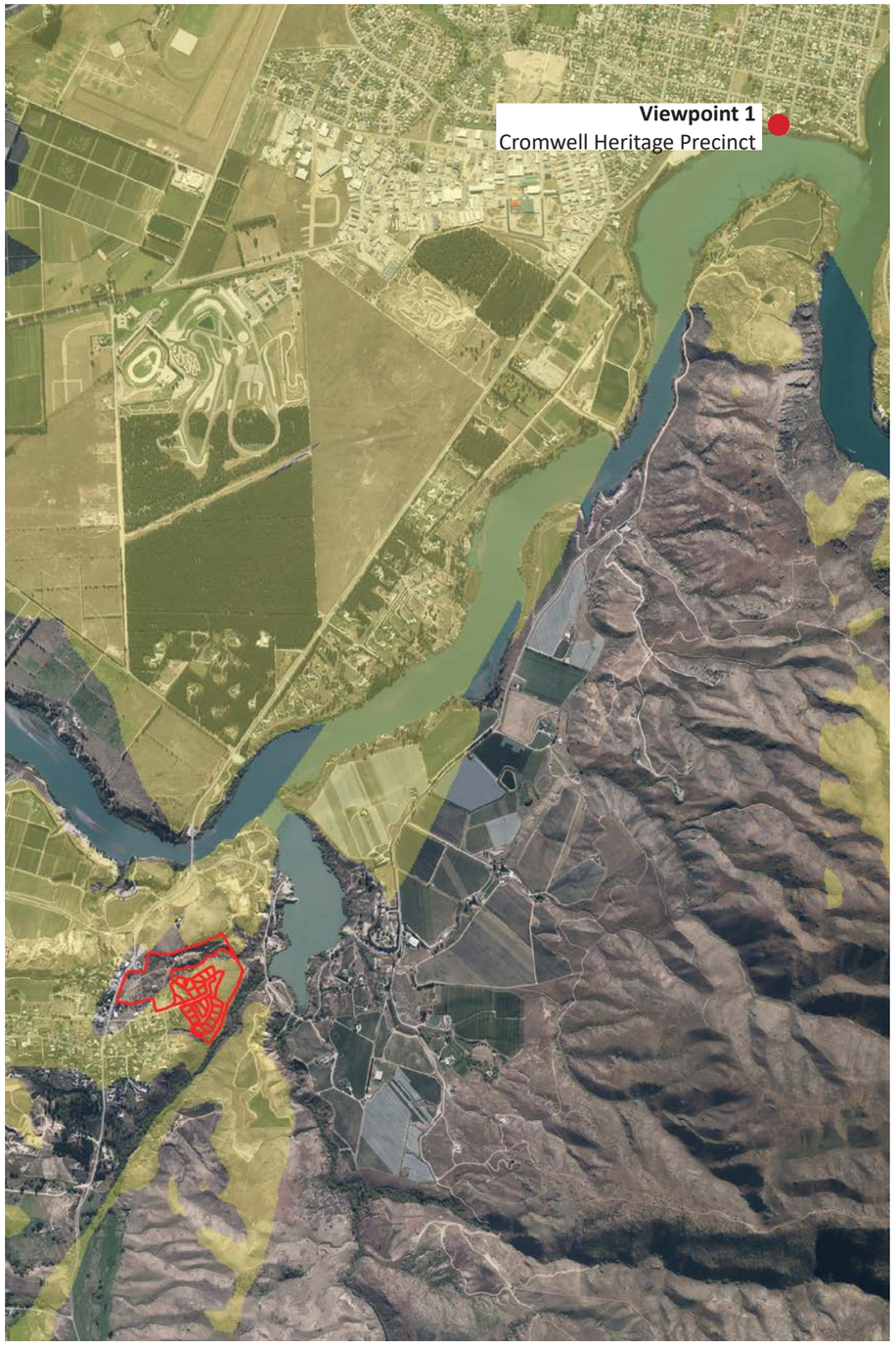


Viewpoint Photograph 11: Terrace Street
Date: 18 March 2022
Time: Between 10:00 and 12:00
Camera: Olympus Digital Camera

Zone of Theoretical Visibility (ZTV) Maps - Viewpoint 1



Visibility to ground level



Visibility to built form of 7.5m high

LEGEND

Property Boundary

Visible areas from viewpoint

Notes:

Visibility analysis is a calculation to determine a set of unobstructed sight lines from a given viewpoint with a 1.70m observation height from the existing ground to the proposed development.

The highlighted are the areas visible from the given viewpoint either to ground level (image on the left) or to built form of 7.5m high (image on the right).

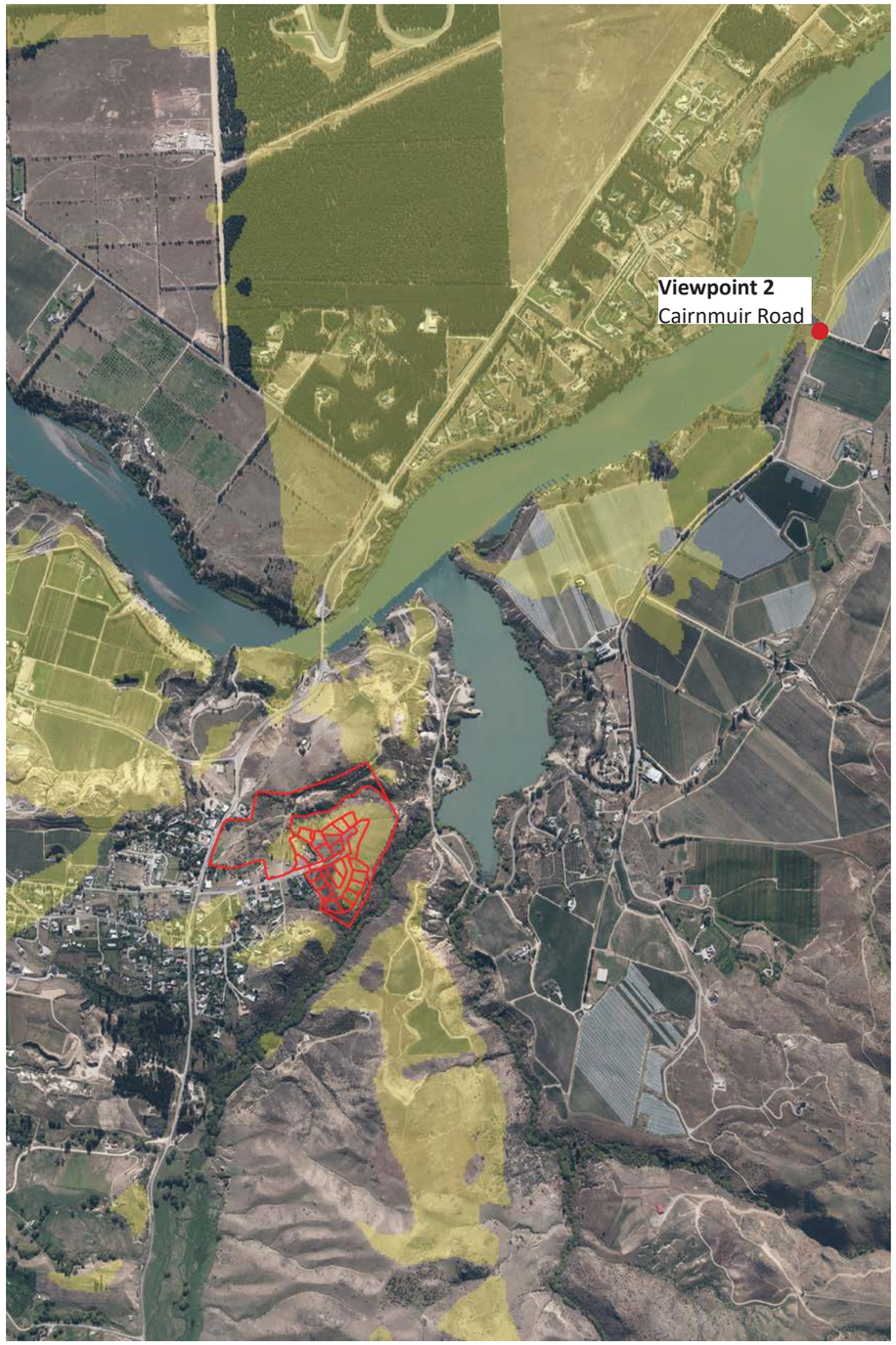
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Ground elevation data is sourced from Land Information New Zealand (LINZ) 8m Digital Elevation Model 2012.

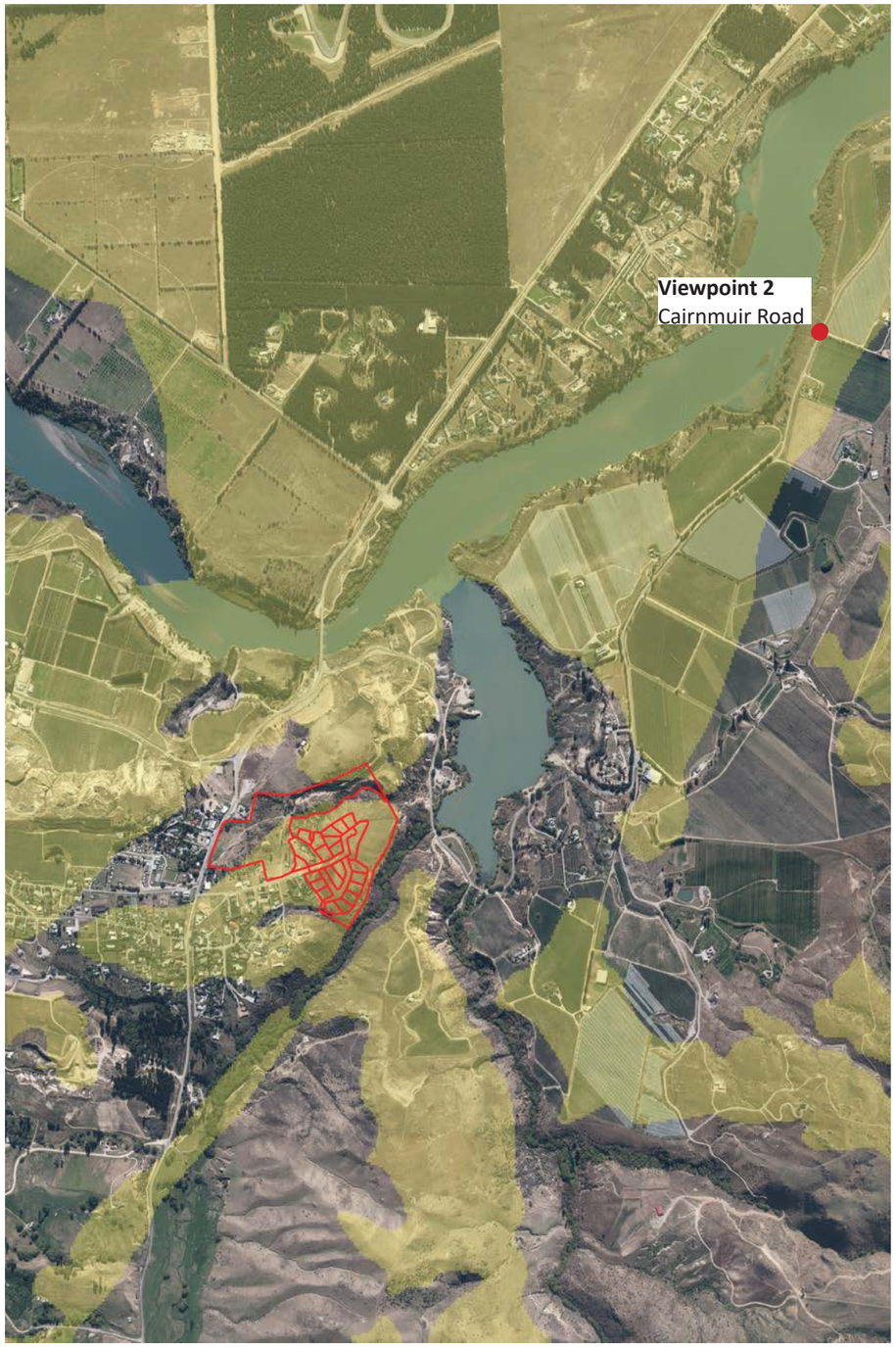
Maximum viewing range taking account of Earth's curvature is 5km.

0 500M 1,000M

Zone of Theoretical Visibility (ZTV) Maps - Viewpoint 2



Visibility to ground level



Visibility to built form of 7.5m high

LEGEND

Property Boundary

Visible areas from viewpoint

Notes:

Visibility analysis is a calculation to determine a set of unobstructed sight lines from a given viewpoint with a 1.70m observation height from the existing ground to the proposed development.

The highlighted are the areas visible from the given viewpoint either to ground level (image on the left) or to built form of 7.5m high (image on the right).

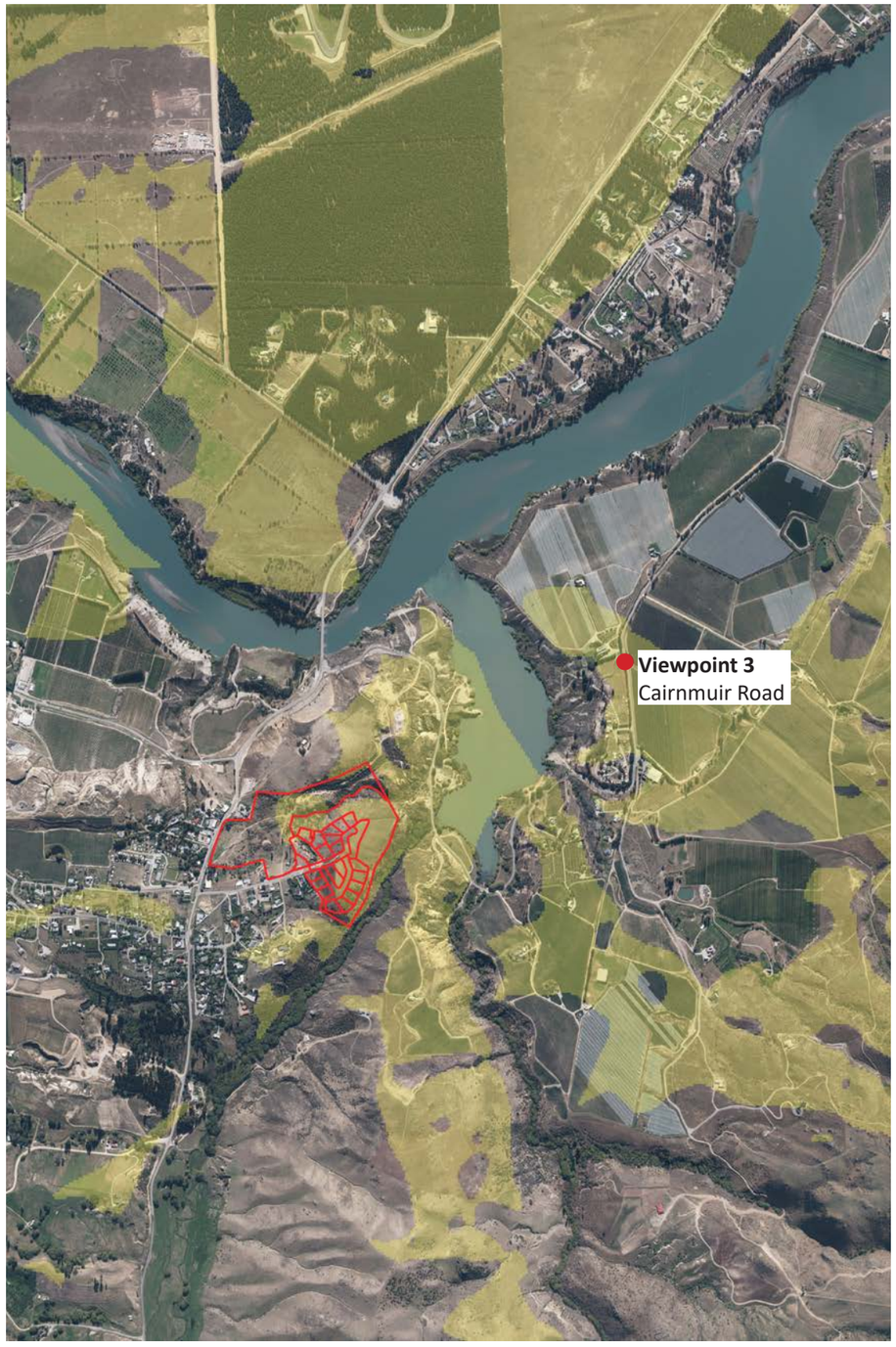
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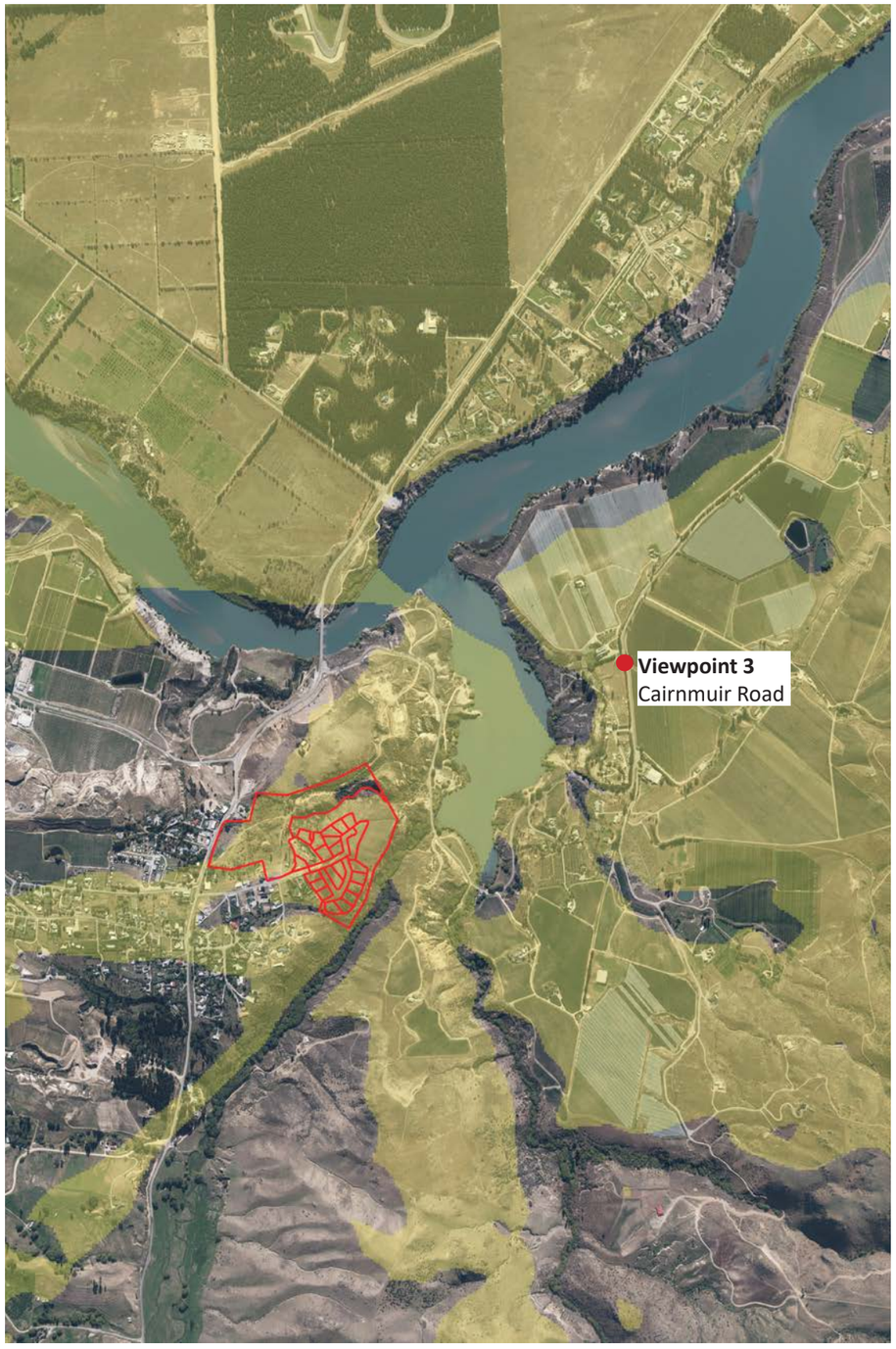
Maximum viewing range taking account of Earth's curvature is 5km.

0 500M 1,000M

Zone of Theoretical Visibility (ZTV) Maps - Viewpoint 3



Visibility to ground level



Visibility to built form of 7.5m high

LEGEND

Property Boundary

Visible areas from viewpoint

Notes:

Visibility analysis is a calculation to determine a set of unobstructed sight lines from a given viewpoint with a 1.70m observation height from the existing ground to the proposed development.

The highlighted are the areas visible from the given viewpoint either to ground level (image on the left) or to built form of 7.5m high (image on the right).

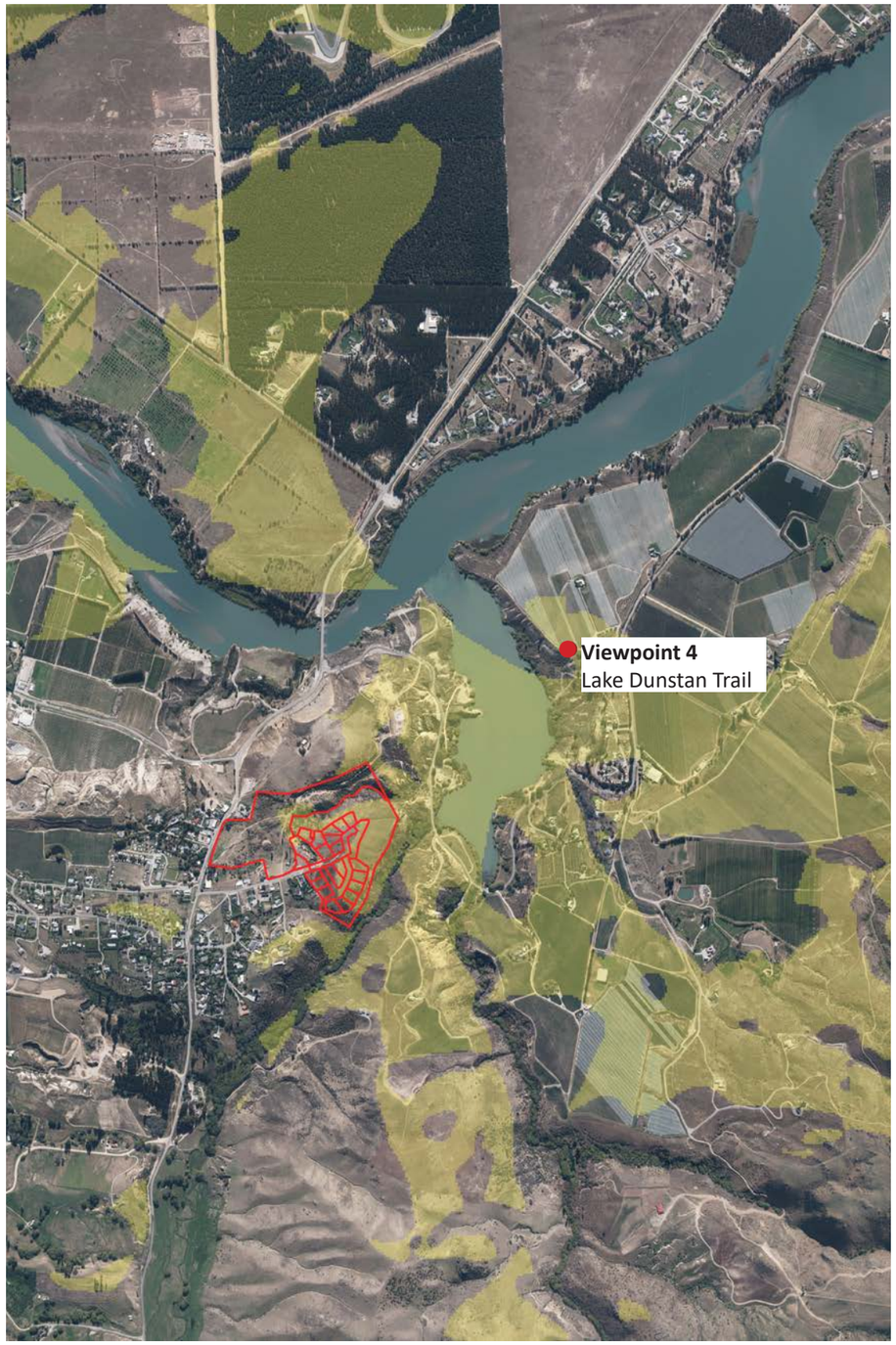
Visibility analysis calculation is based on 'bare earth' terrain model and does not account existing buildings, existing trees, atmospheric elements and other surface elements that may affect visibility at any point between the given viewpoints and the proposed development.

Ground elevation data is sourced from Land Information New Zealand (LINZ) 8m Digital Elevation Model 2012.

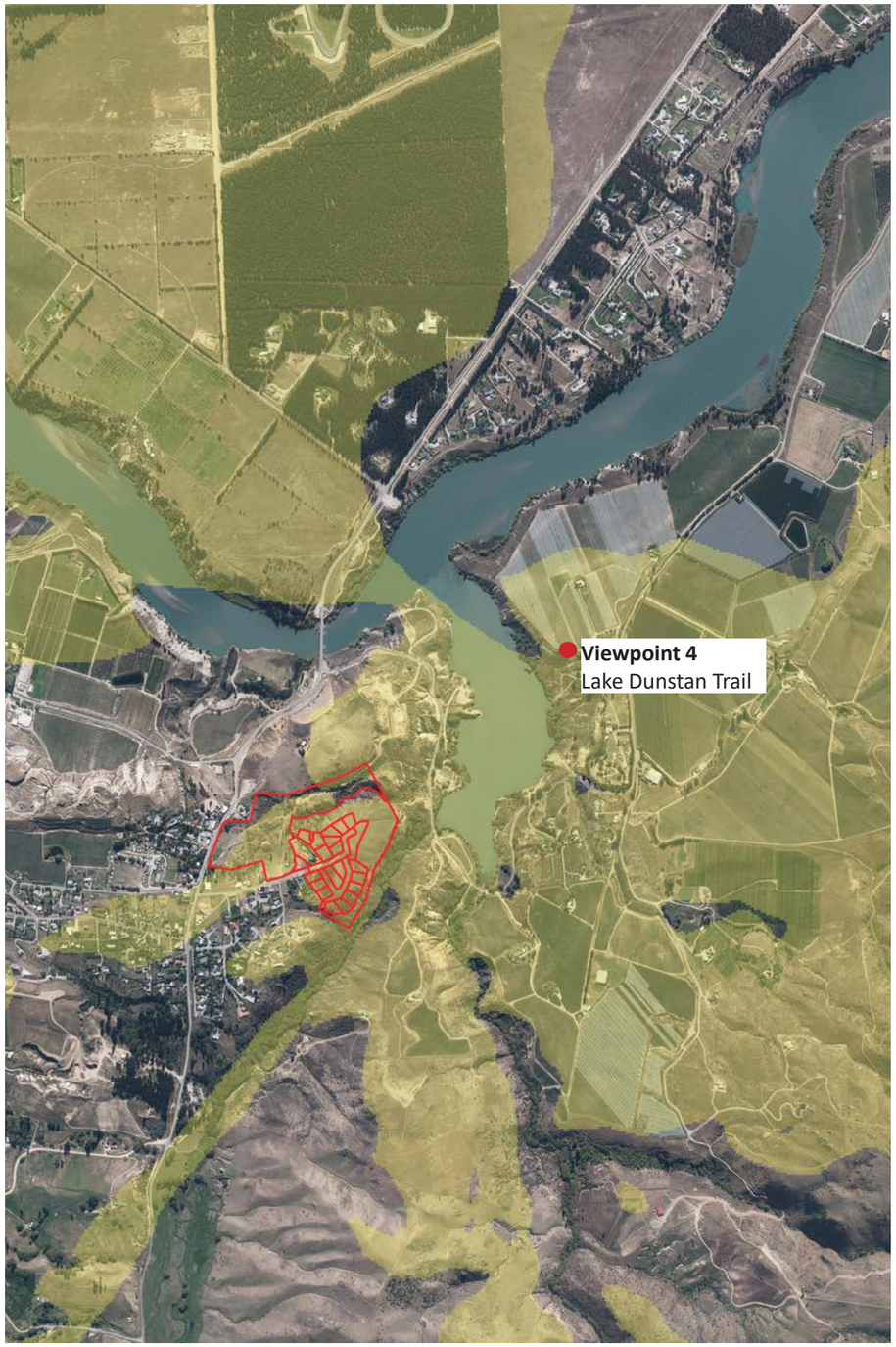
Maximum viewing range taking account of Earth's curvature is 5km.

0 500M 1,000M

Zone of Theoretical Visibility (ZTV) Maps - Viewpoint 4



Visibility to ground level



Visibility to built form of 7.5m high

LEGEND

Property Boundary

Visible areas from viewpoint

Notes:

Visibility analysis is a calculation to determine a set of unobstructed sight lines from a given viewpoint with a 1.70m observation height from the existing ground to the proposed development.

The highlighted are the areas visible from the given viewpoint either to ground level (image on the left) or to built form of 7.5m high (image on the right).

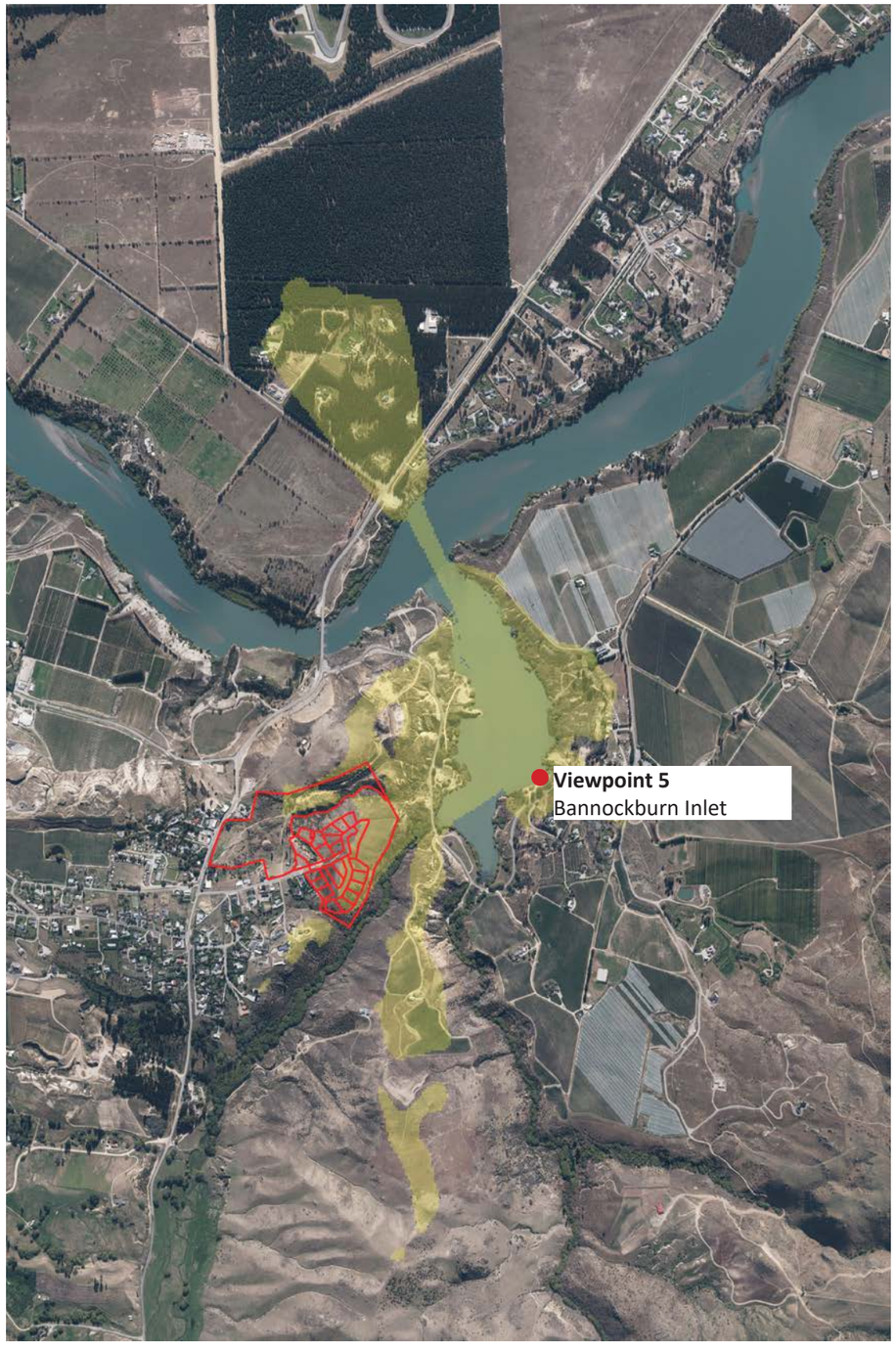
Visibility analysis calculation is based on 'bare earth' terrain model and does not account existing buildings, existing trees, atmospheric elements and other surface elements that may affect visibility at any point between the given viewpoints and the proposed development.

Ground elevation data is sourced from Land Information New Zealand (LINZ) 8m Digital Elevation Model 2012.

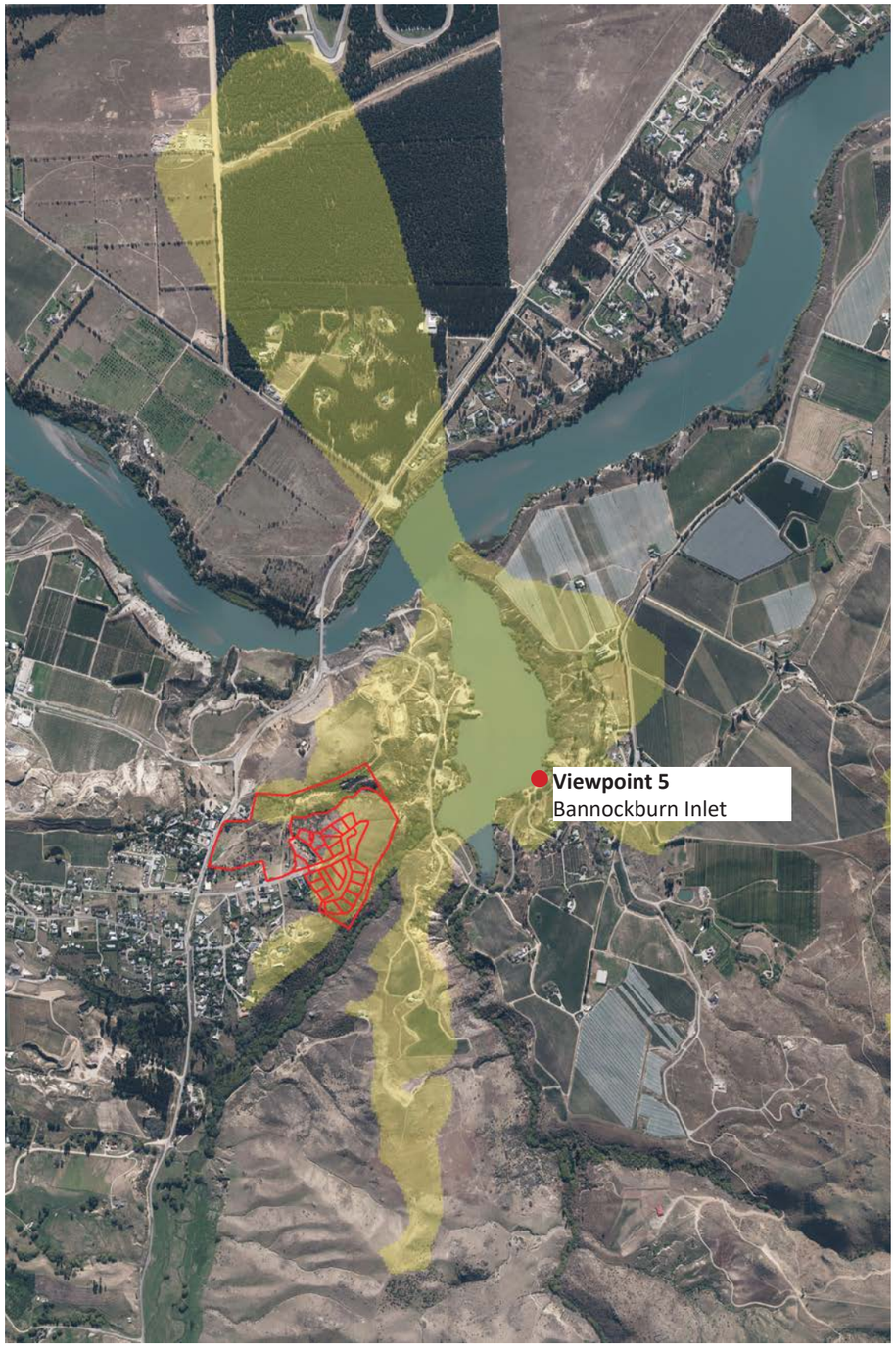
Maximum viewing range taking account of Earth's curvature is 5km.

0 500M 1,000M

Zone of Theoretical Visibility (ZTV) Maps - Viewpoint 5



Visibility to ground level



Visibility to built form of 7.5m high

LEGEND

Property Boundary

Visible areas from viewpoint

Notes:

Visibility analysis is a calculation to determine a set of unobstructed sight lines from a given viewpoint with a 1.70m observation height from the existing ground to the proposed development.

The highlighted are the areas visible from the given viewpoint either to ground level (image on the left) or to built form of 7.5m high (image on the right).

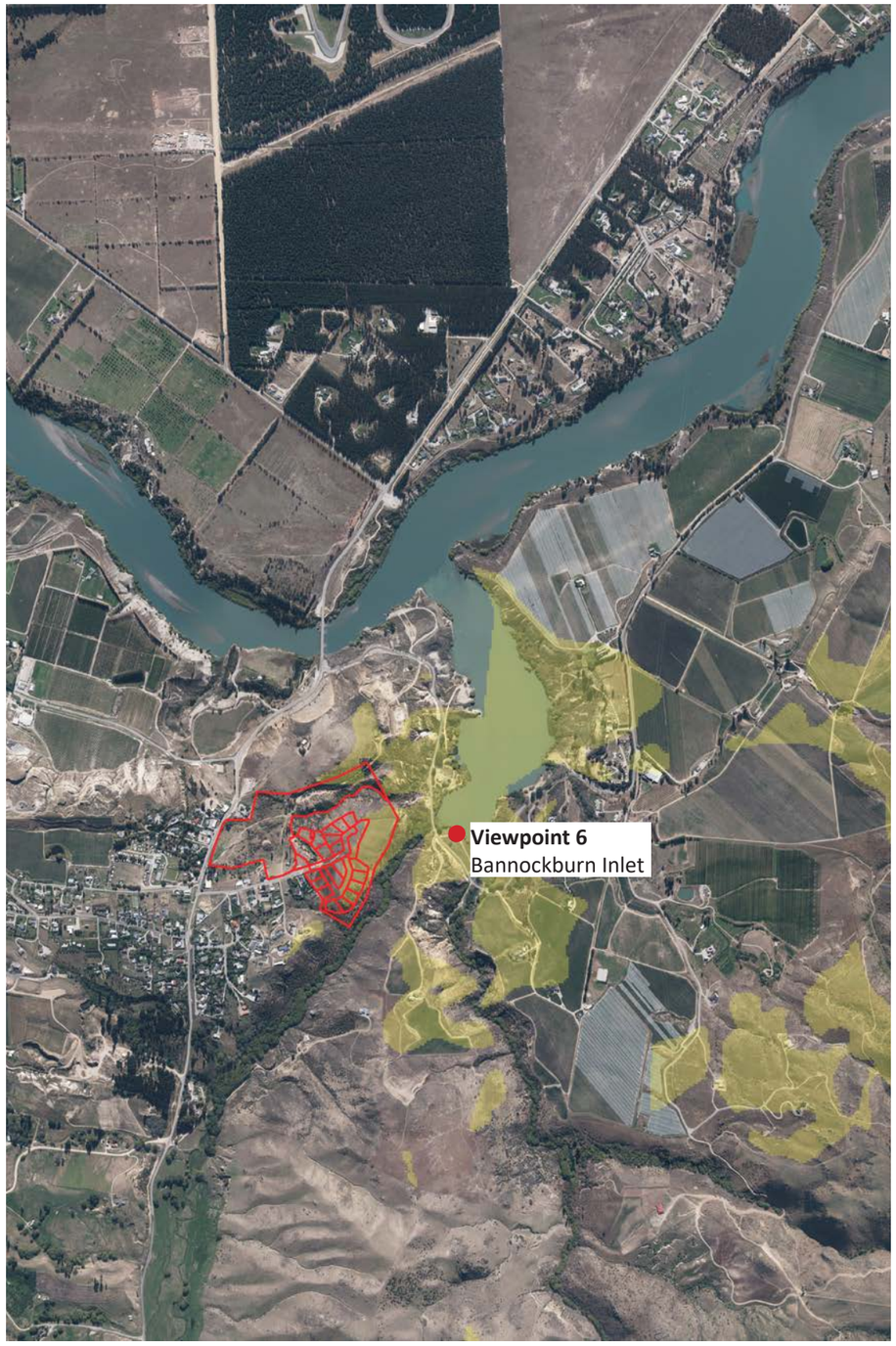
Visibility analysis calculation is based on 'bare earth' terrain model and does not account existing buildings, existing trees, atmospheric elements and other surface elements that may affect visibility at any point between the given viewpoints and the proposed development.

Ground elevation data is sourced from Land Information New Zealand (LINZ) 8m Digital Elevation Model 2012.

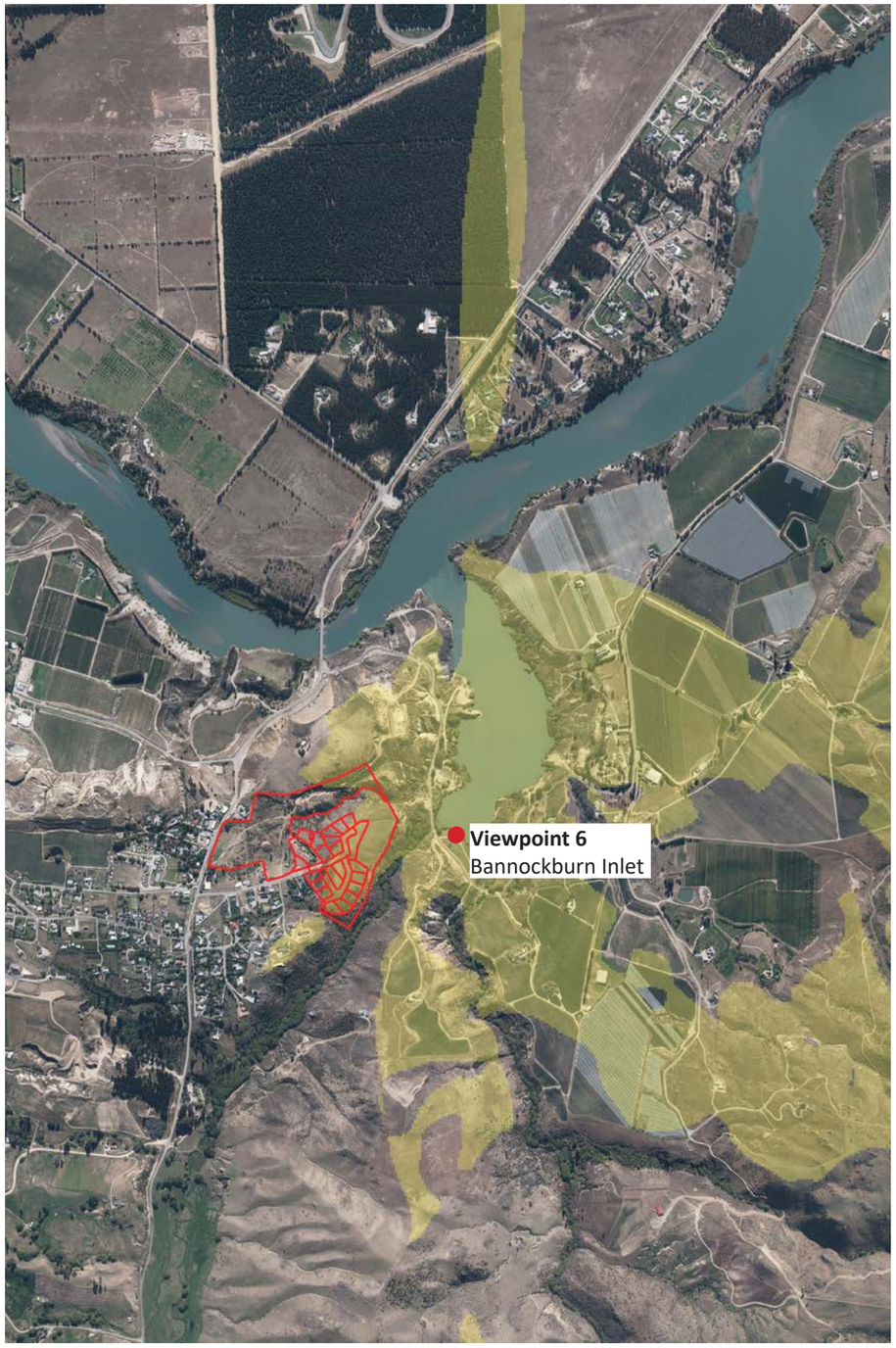
Maximum viewing range taking account of Earth's curvature is 5km.

0 500M 1,000M

Zone of Theoretical Visibility (ZTV) Maps - Viewpoint 6



Visibility to ground level



Visibility to built form of 7.5m high

LEGEND

Property Boundary

Visible areas from viewpoint

Notes:

Visibility analysis is a calculation to determine a set of unobstructed sight lines from a given viewpoint with a 1.70m observation height from the existing ground to the proposed development.

The highlighted are the areas visible from the given viewpoint either to ground level (image on the left) or to built form of 7.5m high (image on the right).

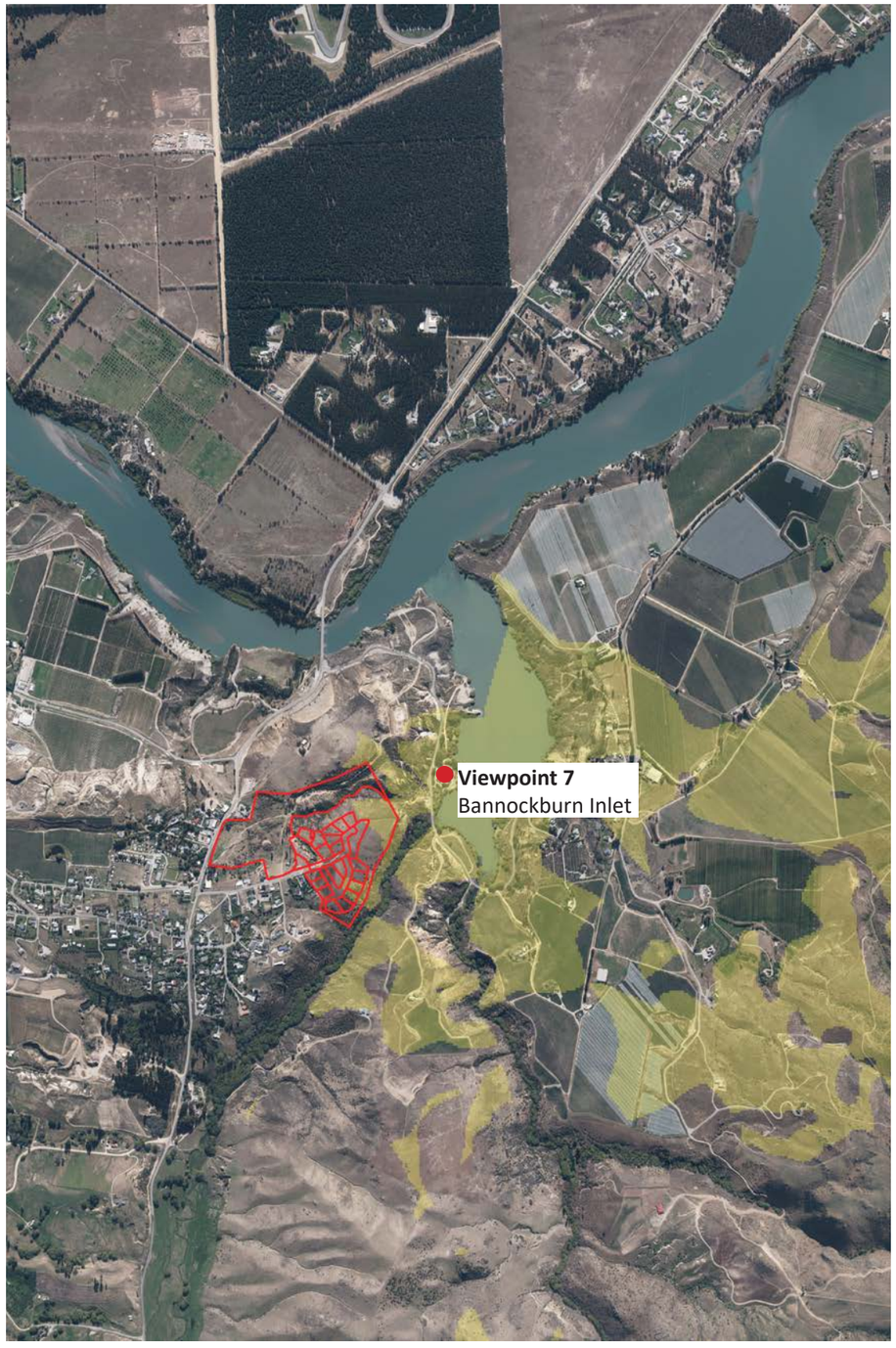
Visibility analysis calculation is based on 'bare earth' terrain model and does not account existing buildings, existing trees, atmospheric elements and other surface elements that may affect visibility at any point between the given viewpoints and the proposed development.

Ground elevation data is sourced from Land Information New Zealand (LINZ) 8m Digital Elevation Model 2012.

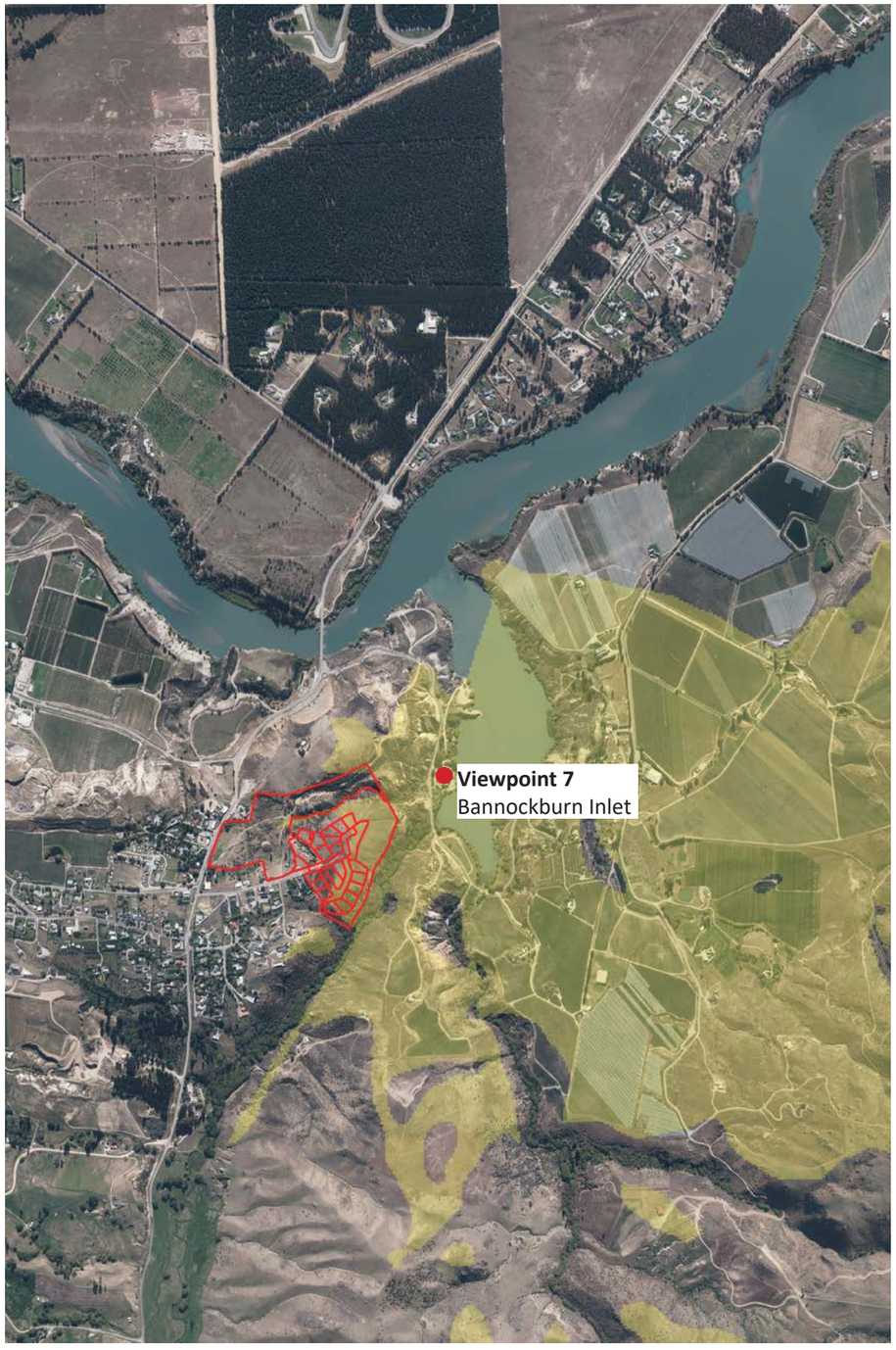
Maximum viewing range taking account of Earth's curvature is 5km.

0 500M 1,000M

Zone of Theoretical Visibility (ZTV) Maps - Viewpoint 7



Visibility to ground level



Visibility to built form of 7.5m high

LEGEND

Property Boundary

Visible areas from viewpoint

Notes:

Visibility analysis is a calculation to determine a set of unobstructed sight lines from a given viewpoint with a 1.70m observation height from the existing ground to the proposed development.

The highlighted are the areas visible from the given viewpoint either to ground level (image on the left) or to built form of 7.5m high (image on the right).

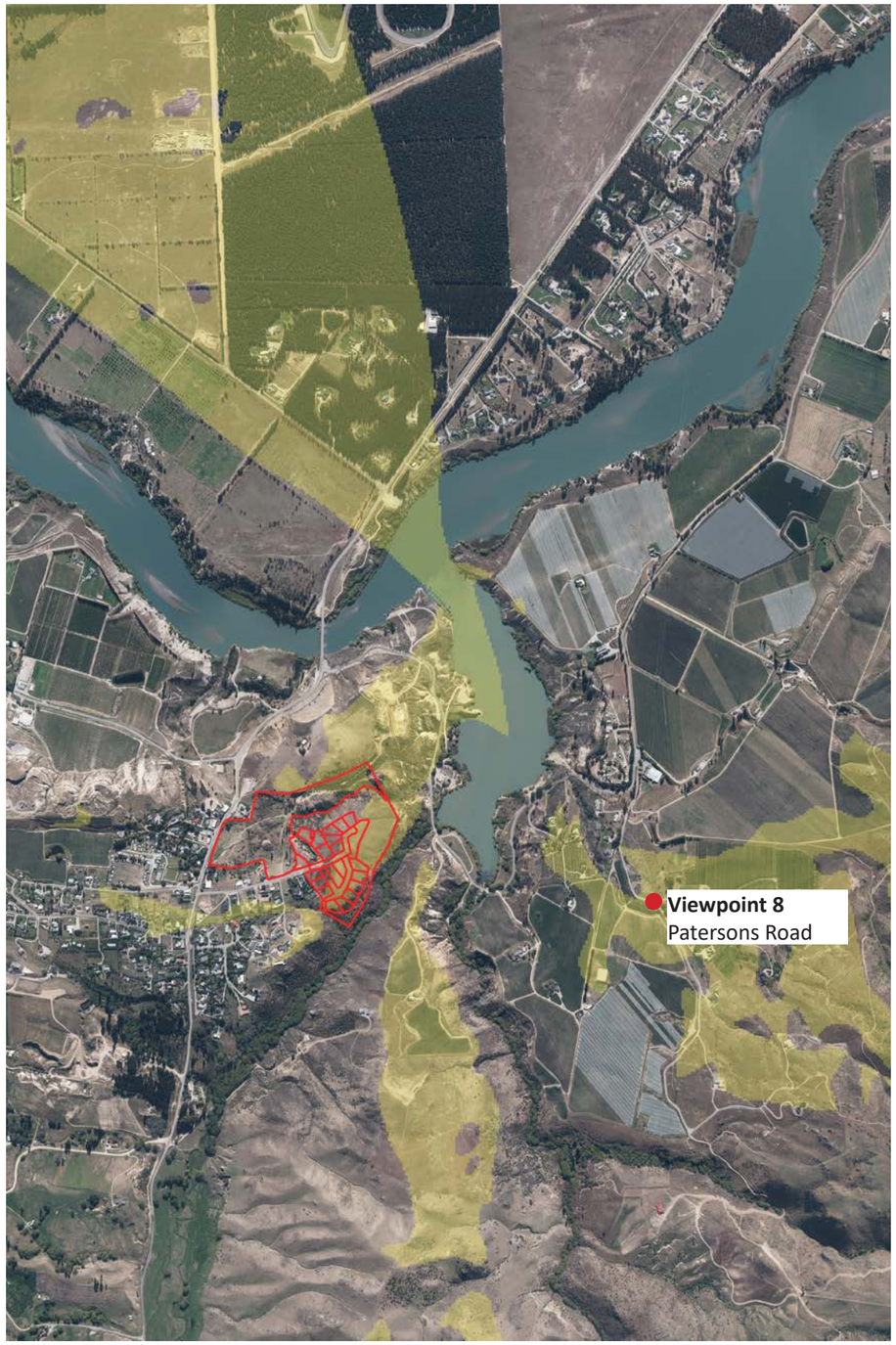
Visibility analysis calculation is based on 'bare earth' terrain model and does not account existing buildings, existing trees, atmospheric elements and other surface elements that may affect visibility at any point between the given viewpoints and the proposed development.

Ground elevation data is sourced from Land Information New Zealand (LINZ) 8m Digital Elevation Model 2012.

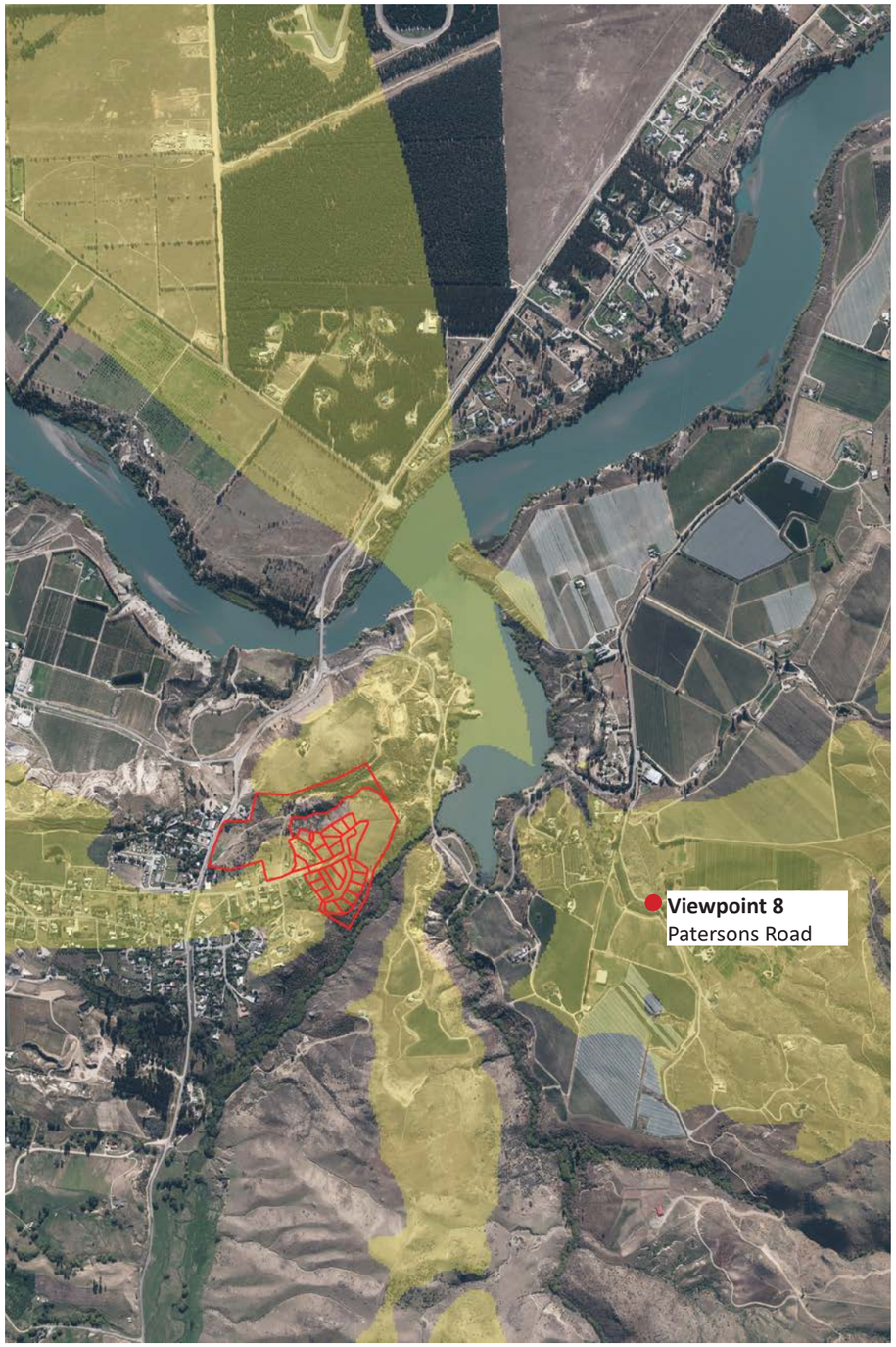
Maximum viewing range taking account of Earth's curvature is 5km.

0 500M 1,000M

Zone of Theoretical Visibility (ZTV) Maps - Viewpoint 8



Visibility to ground level



Visibility to built form of 7.5m high

LEGEND

Property Boundary

Visible areas from viewpoint

Notes:

Visibility analysis is a calculation to determine a set of unobstructed sight lines from a given viewpoint with a 1.70m observation height from the existing ground to the proposed development.

The highlighted are the areas visible from the given viewpoint either to ground level (image on the left) or to built form of 7.5m high (image on the right).

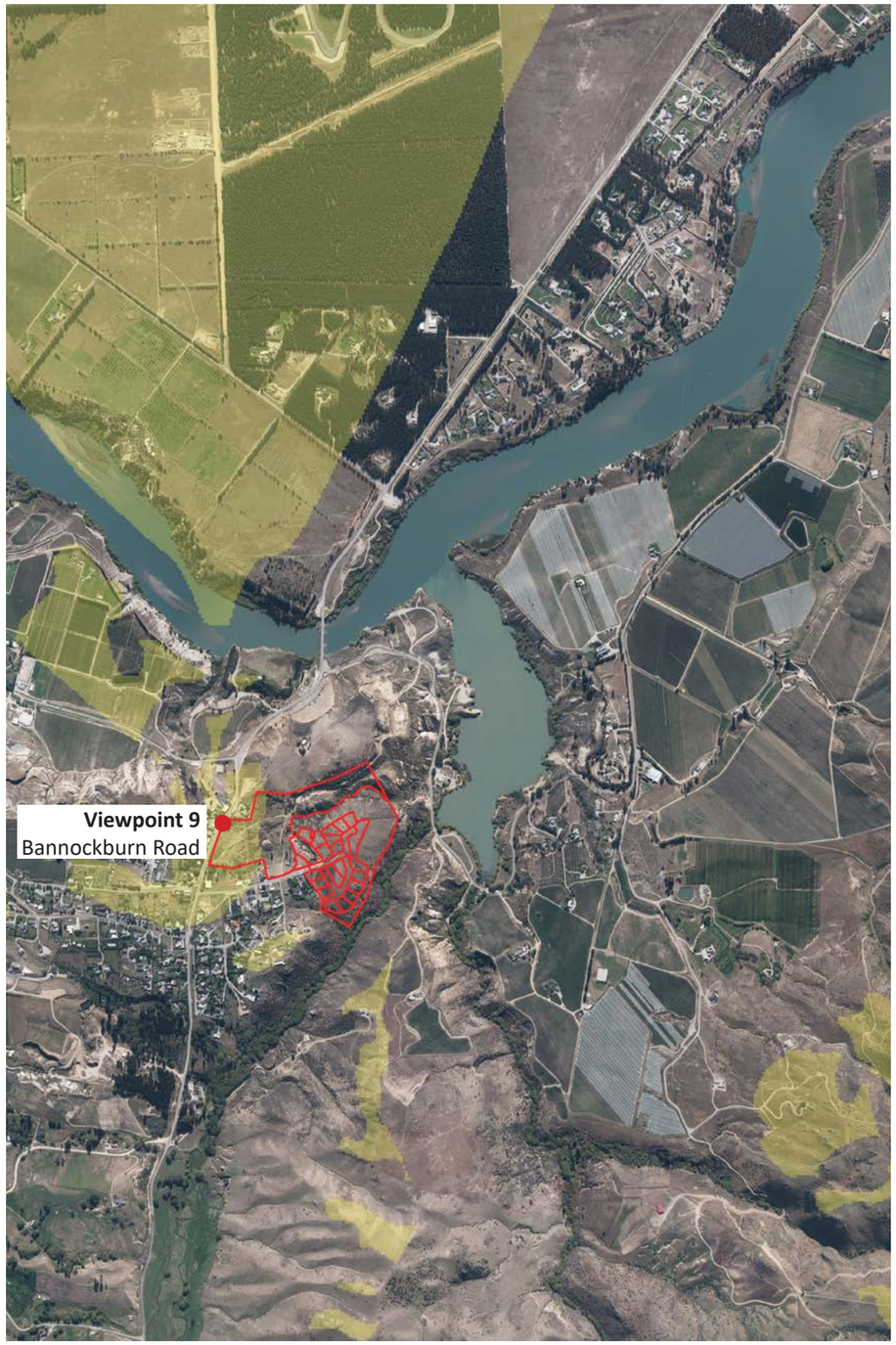
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Ground elevation data is sourced from Land Information New Zealand (LINZ) 8m Digital Elevation Model 2012.

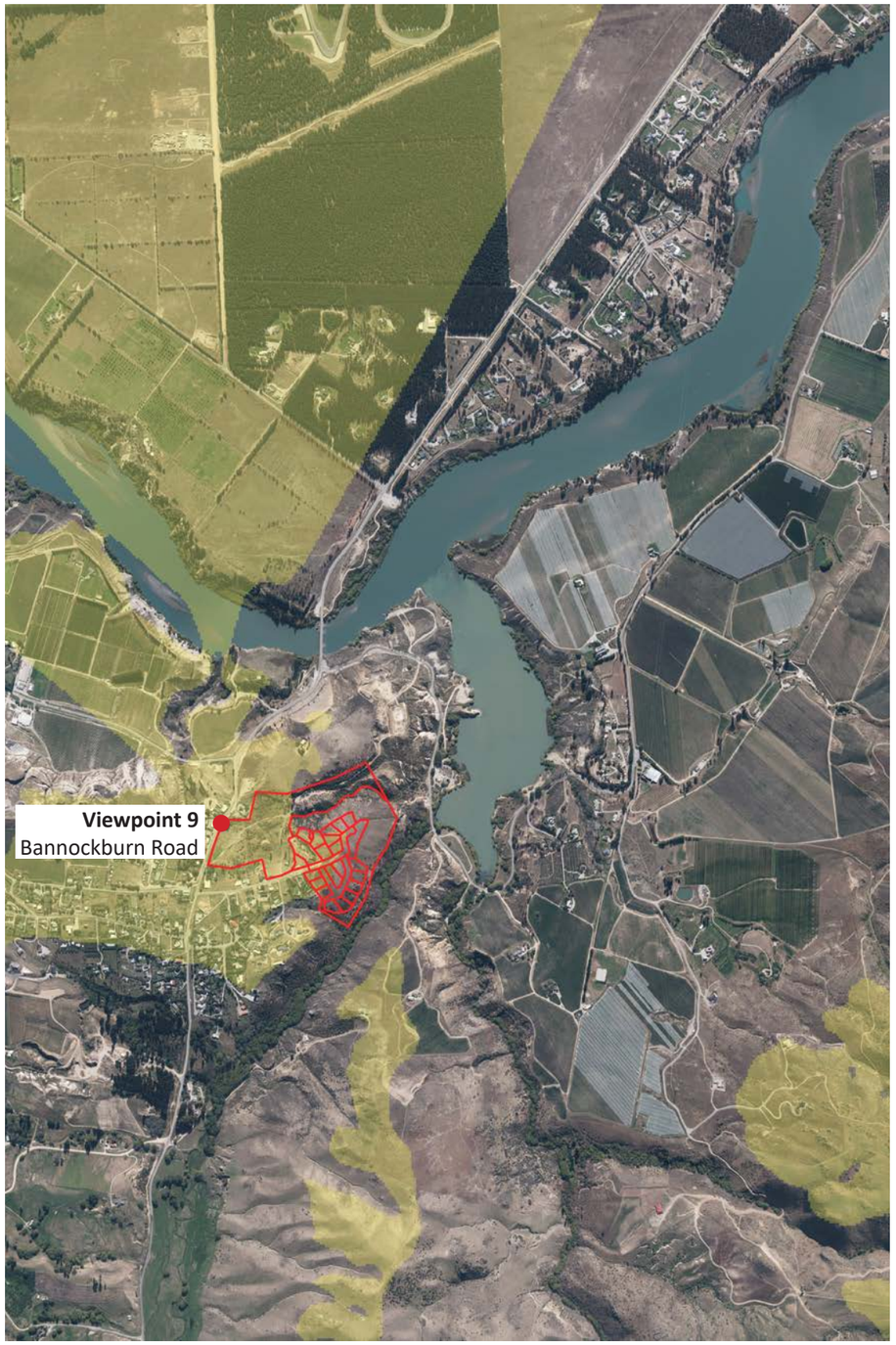
Maximum viewing range taking account of Earth's curvature is 5km.

0 500M 1,000M

Zone of Theoretical Visibility (ZTV) Maps - Viewpoint 9



Visibility to ground level



Visibility to built form of 7.5m high

LEGEND

Property Boundary

Visible areas from viewpoint

Notes:

Visibility analysis is a calculation to determine a set of unobstructed sight lines from a given viewpoint with a 1.70m observation height from the existing ground to the proposed development.

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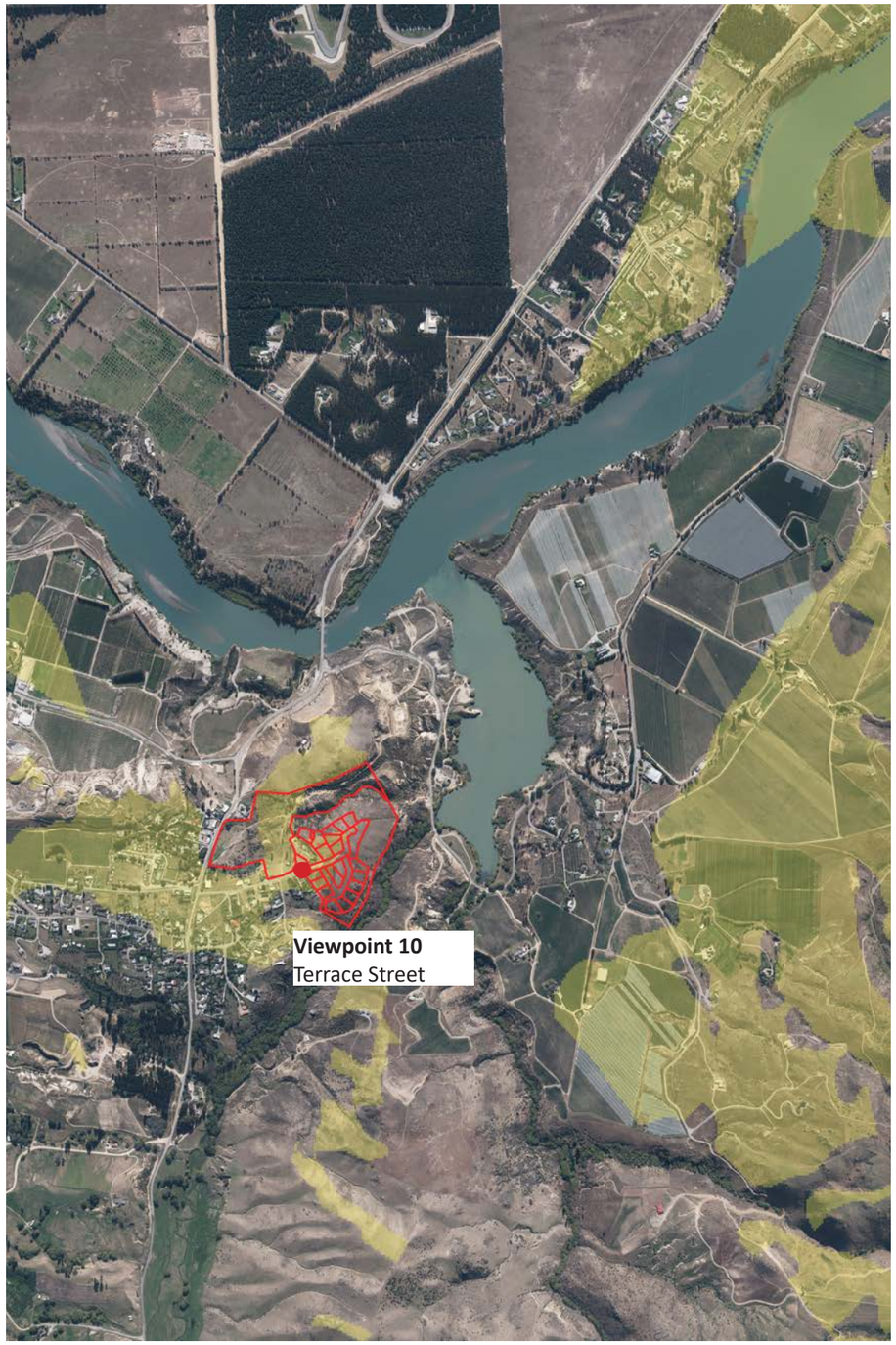
Visibility analysis calculation is based on 'bare earth' terrain model and does not account existing buildings, existing trees, atmospheric elements and other surface elements that may affect visibility at any point between the given viewpoints and the proposed development.

Ground elevation data is sourced from Land Information New Zealand (LINZ) 8m Digital Elevation Model 2012.

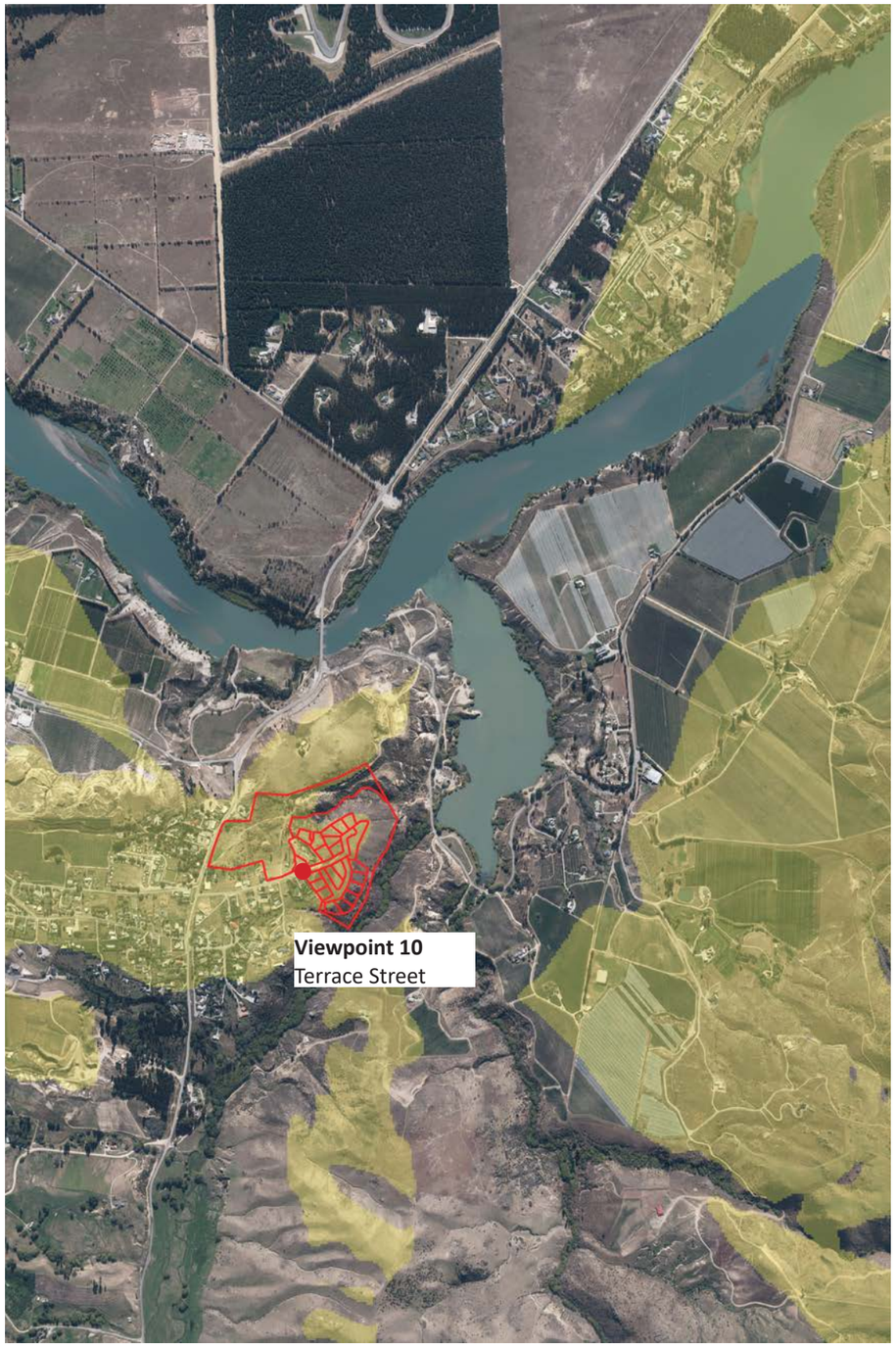
Maximum viewing range taking account of Earth's curvature is 5km.

0 500M 1,000M

Zone of Theoretical Visibility (ZTV) Maps - Viewpoint 10



Visibility to ground level



Visibility to built form of 7.5m high

LEGEND

Property Boundary

Visible areas from viewpoint

Notes:

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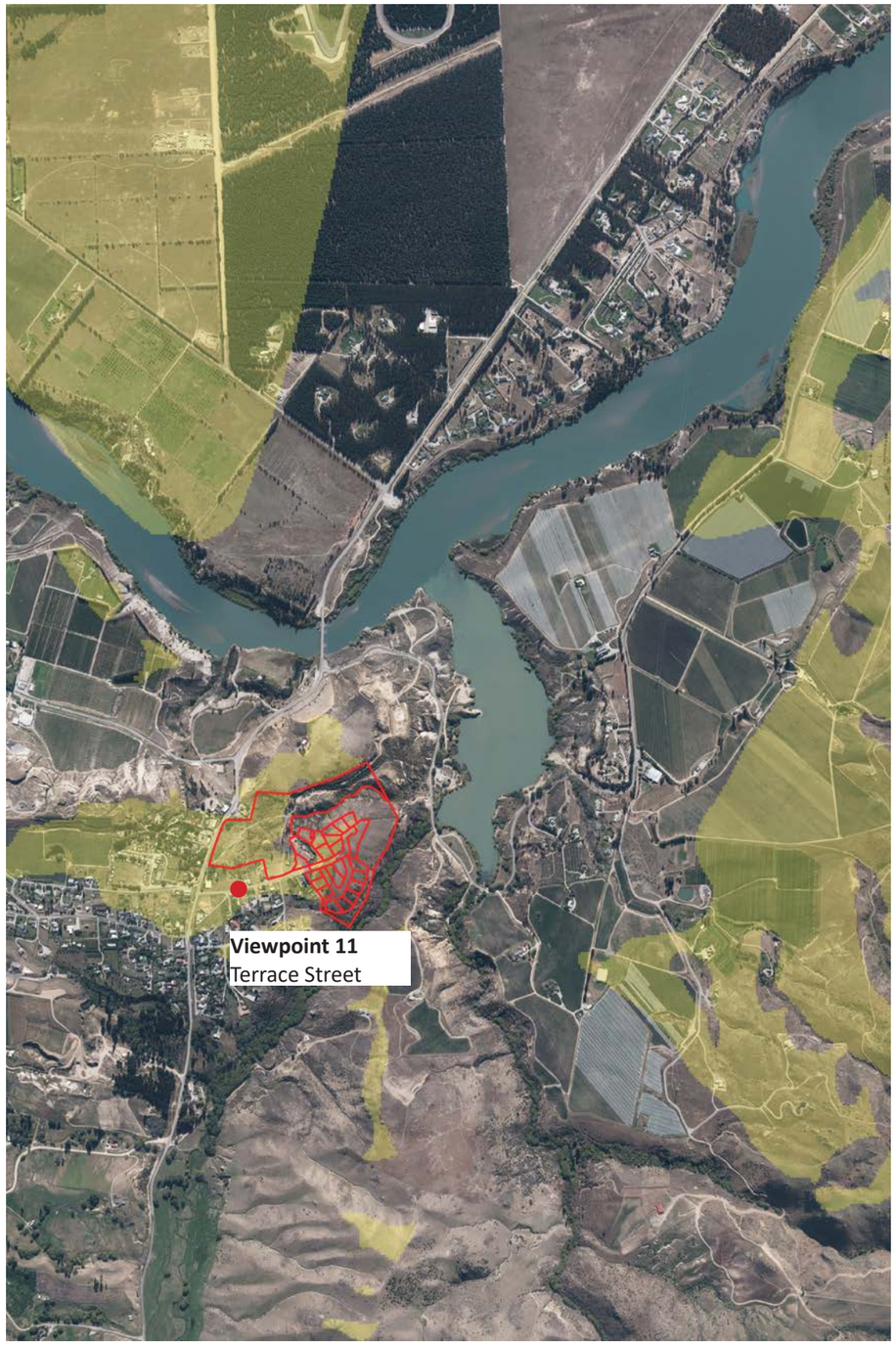
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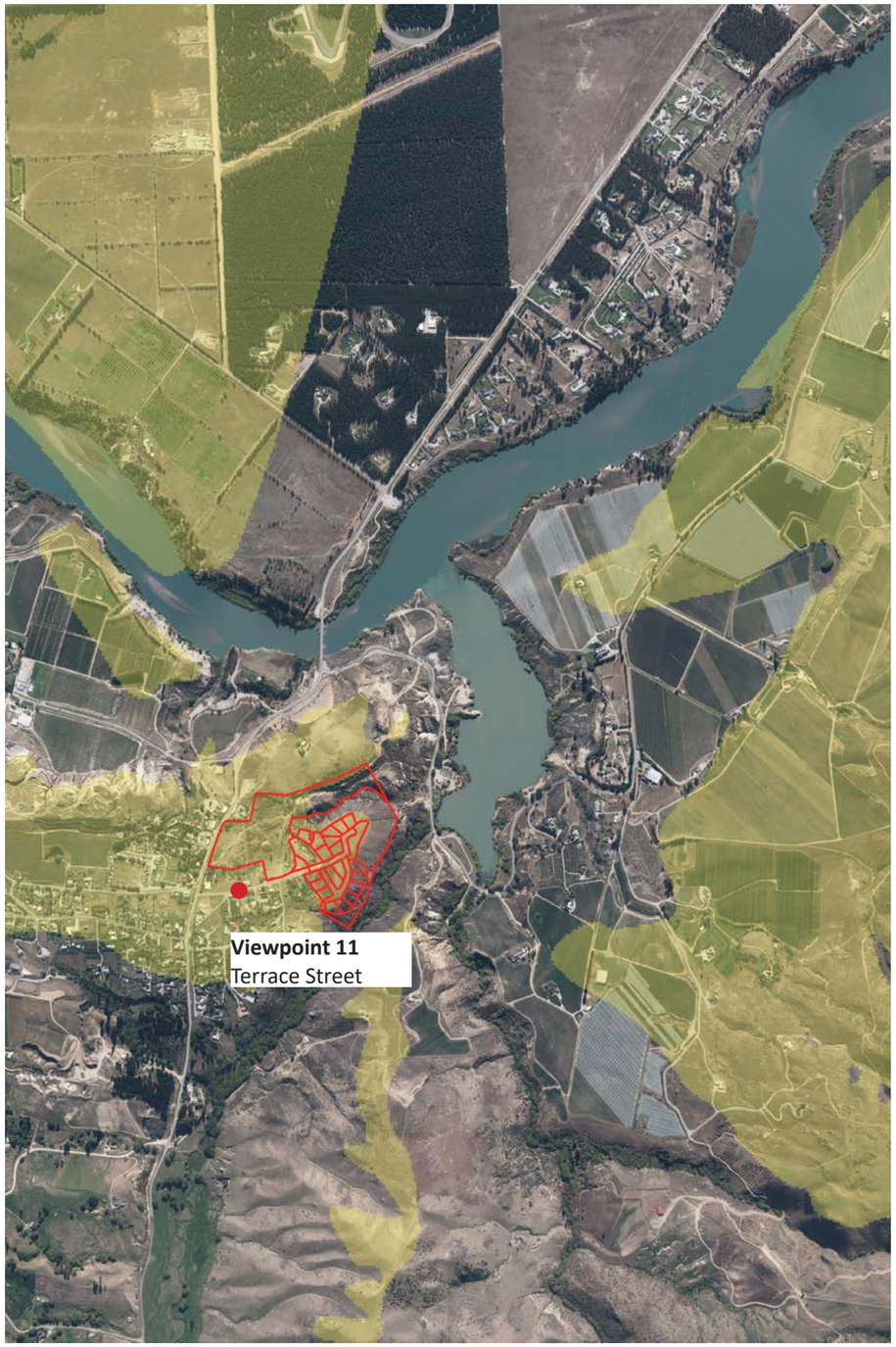
Maximum viewing range taking account of Earth's curvature is 5km.

0 500M 1,000M

Zone of Theoretical Visibility (ZTV) Maps - Viewpoint 11



Visibility to ground level



Visibility to built form of 7.5m high

LEGEND

Property Boundary

Visible areas from viewpoint

Notes:

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ROUGH MILNE MITCHELL
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RMM

rmmla.co.nz

Archaeological & Heritage Impact Assessment:

Lot4 DP 339137 Terrace Street Bannockburn.

Water Race Hill Subdivision - RC2 01 REV C 2023

The applicant (DJ Jones and NR Searell Family Trusts) seeks resource consent from the Central Otago District Council (CODC) to subdivide one certificate of title, totalling 17.614 hectares (ha) into:

- Lots 1-20 residential.
- Lot 100 (0.55ha), Lot 101 (0.47ha) roading lots, encompasses all the roading infrastructure.
- Proposed Public Reserve Lot - 30 is a proposed reserve lot to be vested with the CODC and is 0.41 ha and features the twin Water Race Hill water races F41/369.
- Lot 40: Balance Lot a large balance lot 4.44ha in area which for the most part comprises moderate to steep east to north facing slopes with recorded archaeological features. Lot 40 was initially intended to be vested as a local purpose reserve to formalise the existing walking access. Considered to provide useful walking, amenity and areas for indigenous biodiversity regeneration (both passive regeneration or via restoration). Because the advice from the Council is that Lot 40 is not suitable for a local purpose reserve, the lot will be retained as a freehold lot by the Applicants. The existing informal walkways within this area will be maintained, however no formal recognition of the walking areas is proposed.
- Lot 50: Balance Lot a 7.82ha balance lot that is intended for future development. Lot 50 has frontage to Bannockburn Road and comprise of Revell's Basin sluicing's a recorded archaeological site.
- Lot 51: Balance Lot a 0.53ha balance lot which comprises a recorded archaeological gold workings gully feature F41/368 Pennyweights Sluicing's.

Site Number/s and/or possible unrecorded, subsurface archaeological sites and or material:- F41/369 Upper& Lower Water Race Hill race branches to Revell's Basin & Gorge; and a branch race to F41/368 Pennyweights Sluiced gully remnants; F41/385 Revell's Basin workings &wrs; F41/372 Shepherd's Ck Gorge water race below Water race hill eastern Lot parcels; pending record for historic post & wire fence line ex Sect 40 SO_3081 June 1915;

Commissioned by Chris Fowler Saunders & Co Lawyers for DJ Jones and NR Searell Family Trusts

Matthew Sole
Kopuwai Consulting
Revised Dec 2023

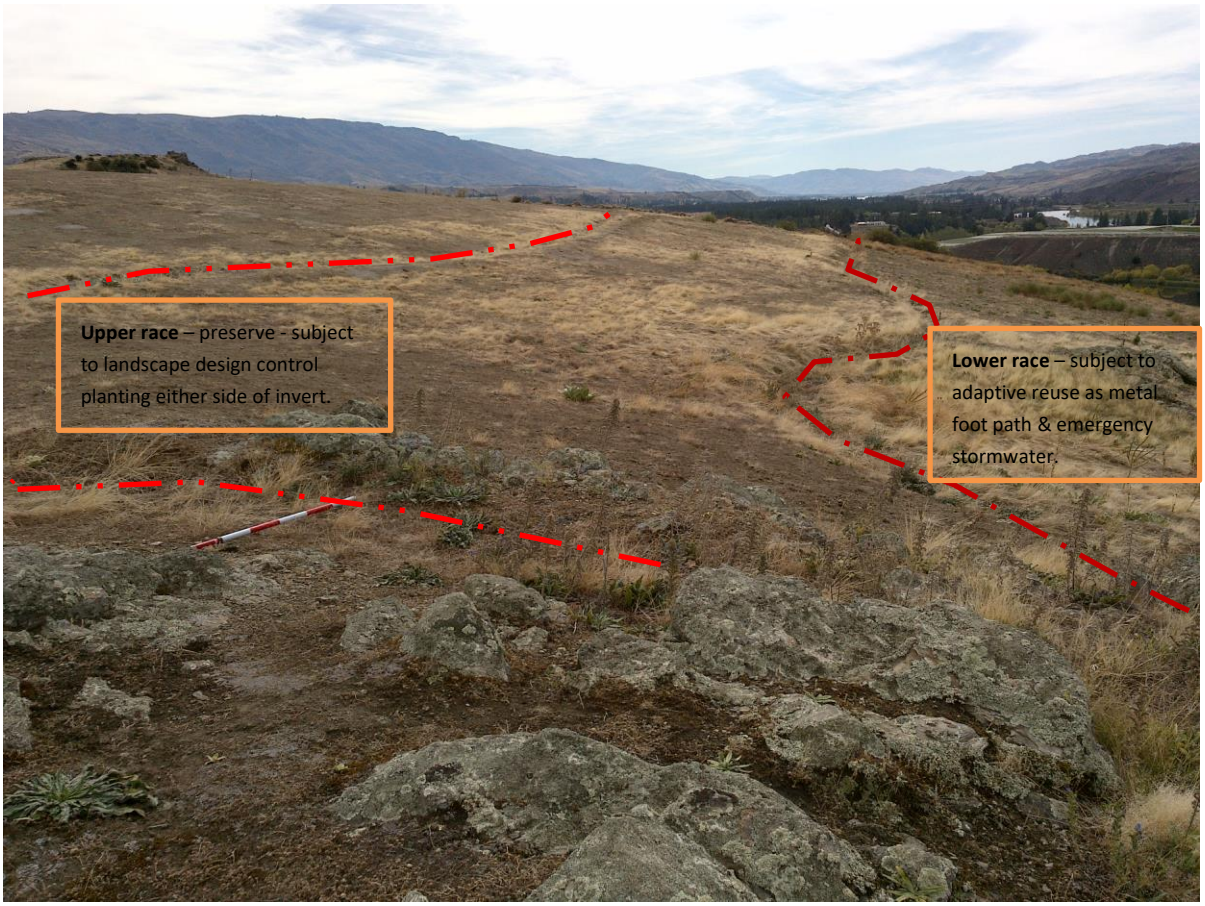


Figure 1 - View north along Upper & Lower twin water races of Water Race Hill F41/369 that supplied early working via flumed pipe over Revell's Gorge to Slaughteryard Hill Reservoir F41/399 to workings NE off Slaughteryard Hill. Kopuwai Consulting 28 03 2017

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Table 9 Revised Table of subdivision effects on archaeological features by proposed subdivision (RC2 01 REV C 2023) by parcel with archaeological comments & recommendations. 60

Abbreviations

Abbreviation	Definition
Arch Site	New Zealand Archaeological Association archaeological site recording data base
CODC	Central Otago District Council
DOC	Department of Conservation
HNZPT	Heritage New Zealand Pouhere Taonga
LINZ	Land Information New Zealand
NZAA	New Zealand Archaeological Association
RMA	Resource Management Act (1991)
RFI	Request for information CODC
BHP	The Bannockburn History Project – Paul Crump
RC	Resource consent
HIA	Heritage Impact Assessment

Acknowledgements

- The DJ Jones and NR Searell Family Trusts for engaging with archaeological process right from the beginning allowing the remaining archaeological values and features to be identified early and with good concept design from Rough and Milne and subdivision build design from Landpro the project has preserved the significant remaining heritage and the sites outstanding landscape and natural character into a unique and sensitive subdivision. Underpinning Central Otago's "World of Difference" values.
- Doug Jones for engaging and assisting with access and site visits.
- Landpro Walt Denley and Ritchie Ford for spatial data files and collaborative work with subdivision design to preserve and minimise the damage and loss of heritage.
- Lawyers Chris Fowler, Meg Buddle and Gabi Newman for facilitating the resource consent stakeholder consultation process.
- Planner Craig Barr, Town Planning Group for collaborative work with resource consent application relating to heritage and recreation.

Executive Summary

The DJ Jones and NR Searell Family Trusts ("the Trusts" or "the applicant") applied to the Central Otago District Council ("CODC") for subdivision development at 88 Terrace Street regarding 17.614 hectares (ha) near Bannockburn, Central Otago (known as "Water Race Hill" or the "site") to enable a proposed 20 lot for residential development including the construction of an internal access road and rights of way, recreation reserve and balance lots (the "proposal")

Resulting from the 2022 – 2023 subdivision redesign an archaeological desktop review has been made based on new resource consent application and plan RC2 01 REV C 2023 and this revised Heritage Impact Assessment (HIA)prepared.

The site contains a significant and diverse array of recorded archaeological sites and features associated with early 1860's goldmining, early main street stable site, commonage ground and coalmining through to the 1930's involving several water races, reservoirs, various sluicing's off respective creek terraces and gullies along with remnants of coalmining associated with Shepherds Creek and Revells Gully.

The applicant commissioned Kopuwai Consulting to complete an expert assessment of historic heritage values associated with the site for a previous subdivision application. This assessment updates the potential adverse effects of this proposal (the culmination of several iterations) on such values and to recommend amendments to the proposal in order to reduce the level of effects resulting from the proposal.

This most recent proposal has seen the latter extent of the upper twin water race F41/369 retained in proposed recreation reserve Lot 30 where previously it was subject to destruction and the other heritage landscape features previously largely preserved in Lot 200 now contained in Lot 40 with the remnants Pennyweights sluiced working F41/368 within Lot 51 and the remaining Revells basin mining features and historic Bannockburn town street dwellings and stables sites in Lot 50 outside of the current subdivision proposal.

This report addresses each of these matters. It has been prepared following an extensive process that included desk-top research, several site visits, dialogue with the applicant and the applicant's project team over various revisions to get to this proposal, and consultation with Heritage New Zealand Pouhere Taonga.

As a consequence of this work several recommendations were made to amend the proposal to reduce its impact on historic heritage values, all of which have been accepted by the applicant.

Historic Heritage Elements on the Subject Site

Water Race Hill and the adjoining Revell's Gully, and interconnected, Slaughteryard Hill, contain a significant and diverse array of recorded and un-recorded archaeological sites and features associated with early 1860's goldmining and adjacent coal mining through to the 1930's, as well as commonage grounds, farm steading, a historic main street stable site and hotel orchards.

The historic heritage elements found on Water Race Hill, can be loosely grouped into the following categories:

1. Water races - main stem and minor distribution.
2. Sluice faces, sluice gulches, sludge channels and tailings.
3. Historic fences; and
4. Reservoir and stacked schist rock retaining features.

Note that of the above four groups of heritage elements, only the water races and the historic fences will be physically affected by the residential subdivision proposal.

Summary of heritage impact assessment and recommendations

The combined heritage values of this peninsular bounded by Shepherd's Creek, Bannockburn Inlet, Kawarau Arm and Bannockburn Village features some of the earliest mining sequence remains of Bannockburn, past historic main street dwellings and stable sites, as well as later coalmining activity and commonage land and farm steading.

The landscape, topography and heritage tapestry of the site is significant and combine to offer rich potential for its next sequence of land stewardship. Our knowledge of previous uses of the site coupled with its location, landform and setting requires due diligence for its future land use. The combined and collective early archaeological and landscape evaluation and planning is a credit to all involved. The sensitive and respectful landscape master plan informed by the spatial archaeological survey and good subdivision design recognises the significant values of the site and sets the basis for the subdivision application for Water Race Hill.

The combined efforts of the design team have assessed and recognised the combined natural landscape, heritage landscape, cultural setting and recreational attributes within and adjoining the subdivision proposal. Specifically for the assessed archaeological features the subdivision has been fitted around and within historic sluiced gullies and gulches constructively retaining the historic features and integrating them along with the landscape recreation values as a subdivision with defining and enduring points of difference. Good design is preserving and integrating values and features that on first appearances could have been deemed by some as hindrances.

A key change with this RC2 01 REV C 2023, 20 lot subdivision is the majority of the heritage values are now confined within three largely peripheral, non-residential lots being Lots 30, 40, 50 and 51 which largely avoids dissection and truncation, retaining more intact heritage features and heritage landscapes for better preservation, legibility, appreciation and consistency of management into the future.

Specific to Water Race Hill residential lots and roading subdivision, the elements of twin water race components F41/369 which serviced the gold workings and later coal mines, with upper water race servicing Slaughteryard Hill via what would likely have been an impressive aerial canvas flume/pipe line across Revell's Gully, both of the twin branches, are proposed for the greater extent to be integrated into subdivision especially the lower water race of the twin races. The key parts of both twin races (140m in length) leading NE into Revells Gully are in Lot 30 proposed as Recreation Reserve. Most of the lower twin water race is proposed for adaptive reuse as subdivision path and emergency stormwater conveyancing, with a combination of driveway and track access crossings.

The upper race portion within Lot 30 will have landscape design control mitigation planting either side of the water race invert to provide visual screening of built form on lots 5, 10-14 from viewpoints east of the site. While preserving the upper water race it will be largely visually obscured and functionally disconnected in terms of visual legibility. The sections within road reserve will be destroyed and less legible portions traversing residential Lots 2, 4, & 6 may be modified subject to building platform location and earthworks.

Some removal and possible reuse of identified fence sections are also impacted by the subdivision of residential lots 9, 8, 11, 12, 13, 14, 30, 40, and 101, along the northern boundary with Revells Gully. All subject to Heritage NZ approval via the pending archaeological authority application informed by this archaeological assessment.

The lower water race along the bottom of the subdivision boundary along the true left of Shepherd's Creek servicing sluicing's along the creek and around to Revell's Gully is proposed for adaptive reuse as an informal bare ground walking trail in the old race formation (F41/372) within Lot 40 the 4.44 ha a proposed freehold parcel identified for its informal walking, amenity and natural area values. It is proposed for an archaeological authority to adaptively reuse the Shepherd's Creek water race (F41/372) within Lot 40 as an informal walking trail within Lot 40.

No modification would be required to the trail, other than some pegging/trail marking, and some bramble vegetation clearance. The exact route that the trail will take is yet to be determined, in lieu of an additional site visit to identify a

logical and achievable route. This bare ground walking trail will form part of a loop around the Water Race Hill subdivision, linking back via true right faces of Revells Gully and up through the remnants of Pennyweights Sluicing's F41/368 on the western side of the subdivision. Thus, enhancing engagement and appreciation of the wider heritage and landscape values.

Along Shepherd's Creek boundary and up and over the brow of the ridge overlooking Revell's Gully are the remnant remains of early hardwood (Totara) posts and wire fence subsequently repaired with ex railway sleeper posts and rabbit netting. These are associated with earlier small farmlet and Bannockburn commonage grazing use. A representative section of the fence line is proposed for retention along the bottom boundary of Shepherd's Creek and up above Revell's Gully associated with Lot 40.

Revell's Basin and Gorge is a recorded archaeological site F41/795 containing archaeological remnants of various phases of mining associated with the two lots 40 & 50 and setting it aside as freehold, with appropriate management of historic and natural values this will see these preserved and appreciated into the future.

The proposed installation of a heritage and landscape interpretation panel detailing and interpreting what remains and how to care for it will help mitigate some of the subdivision effects on heritage, empower community care and stewardship into the future along with informing recreational use. Outside of the residential and roading components (excepting the adaptive reuse lower water branch) of the subdivision but within Lots 30, 40 and 51 there is a significant array of identified heritage remnants. As land parcels these need to be managed and preserved.

In summary the heritage landscape is assessed as being of medium value. The magnitude of impact arising from the proposal is assessed as minor to moderate. Overall, taking into account the recommended changes, the revised proposal is assessed as having slight to moderate impact on historic heritage values within the site.

Summary of archaeological assessment and recommendations

There are four recorded archaeological sites within Water Race Hill boundaries. However, there are many other archaeological features that have been identified through the site survey that have not been formally registered which are identified in this report.

This report makes a number of recommendations centred around the guiding principle that every practical effort should be made to avoid damage to any heritage or archaeological site, whether known, or discovered during any redevelopment of the site and subsequent staged levels of modification, adaptive reuse down to destruction as a final option. These are detailed below in the Recommendations section of the assessment report and for proposed subdivision Lots in Table 9.

Summarised recommendations on Water Race Hill Lot 4 heritage consist of

- Key water races – sections to be preserved, adaptively reused for paths and tracks and portions for disturbance/destruction subject to archaeological authority application and consent by HNZ
- Key historic Lot 4 boundary fence lines – sections to be removed and salvable posts stored for reuse/repair of sections boundary proposed for retention subject to archaeological authority application and consent by HNZ
- Management of subdivision works by archaeologist monitoring and preparation and HNZ approval of Heritage management plan for the subdivision.
- On going Heritage Site management of recorded and unrecorded heritage on balance Lot 4 land outside of subdivision.

Table 9 summarises the revised subdivision plan (RC2 01 REV C 2023) effects on archaeological features within each lot, with revised archaeological protection notation, protection detail, specific archaeological comment and

recommendations for archaeological authority and informing planning conditions/provisions recommendations.

Introduction

Purpose of report

This report provides an archaeological assessment and a heritage impact assessment of the proposed Water Race Hill subdivision and land use consents regarding Lot 4 DP 339137. It encompasses heritage features associated with the site and adjacent land parcels.

The report includes recommendations in relation to the resource consent applications and recommends an application for archaeological authority. It is to be read as a complete report and is applicable to the subdivision scheme plan version RC2 01 REV C 2023 as prepared by Landpro supplied (the **subdivision plan**) Figure 3 & Figure 4.

Description and scope of assessment commission

In 2016 I was approached to survey and identify remaining above ground archaeological sites and features of Stage one of Water Race Hill off Terrace Road Bannockburn, with the purpose to inform subdivision design for a RMA resource consent and inform an archaeological assessment to support an archaeological authority to Heritage NZ for consent to destroy and or modify identified less significant remaining heritage that is unable to be avoided or needs modifying by the subdivision design.

The scope has been primarily designed around Stage 1 Water Race Hill portion of Lot 4. The wider surrounds of the Trust's Lot 4 Revell's Basin and Gully and Part Section 103 Slaughteryard Hill have been surveyed for heritage landscape context and inform assessment of significance along with informing both the current subdivision plan and future subdivision staging.

This was a forward thinking and best practice approach to be commended and acknowledged for front footing the identification of remaining heritage values and being able to spatially identify and map early, the significant remaining heritage values for sensitive and respectful incorporation into the subdivision design process early on. The use of a landscape architect early on also facilitated with the identified heritage values the combining of the strategic and integrated use of the site's topography and natural landscape and adjoining Bannockburn heritage town scape and the recreational and amenity values of the Bannockburn Inlet and the wider Cromwell Basin.

Water Race Hill

The site is located near Bannockburn, Central Otago. It lies between Bannockburn Road (west) and Shepherd's Creek (east & south) with Revells Gully (north). It contains 17.614 ha and is accessed off Terrace Street.

The combined land parcels and adjacent land feature remnants of progressive goldmining sequences from early ground surface workings and with the sourcing and construction of water races and reservoirs along with the advances in mining techniques saw the scale and extent of sluicing and hydraulic sluicing expand across the Bannockburn landscape with Lot 4 and Part Sect 103 featuring intact and representative examples of such. A significant feature at the time would have been the construction and operation of a likely canvas piped flume across Revell's Gorge to the Slaughteryard Hill Reservoir servicing the sluicing's off Slaughter Hill to the east and around into the lower Revell's gorge.

The locality has also featured sites of store and stables associated with the early history and life of Bannockburn main street. A defining feature coinciding and following on from the sustained period of gold mining is the rich and intense sequence of coal mining companies that operated tightly within Slaughteryard Hill, Revell's Gully, Shepherd's and Bannockburn Creeks. This phase saw occupation of the only remaining huts site change from gold miners to coal miners. The land outside of the mining was used as Bannockburn commonage and farm steading evidenced by enduring early hardwood post and wire fencing still remaining.



Figure 2 The Water Race Hill land Lot 4 DP339137 with key place names showing.

The Proposal.

Overview

The revised subdivision and land use resource consent is sought to establish 20 lots for residential activity, roads, a recreation reserve and small balance lots.

The subdivision will involve earthworks to create the internal access road and vehicle accesses into each lot, and associated subdivision development works to form the frontage to the lots, trenching and installation of reticulated water, wastewater and telecommunications infrastructure. No earthworks are proposed to facilitate the building sites within each proposed residential lot.

Figures 3 & 4 are subdivision plans illustrating the location of the proposed lots, roads, paths, tracks and reserves.

The earthworks associated with the subdivision will be in the order of 11,000m² in area.

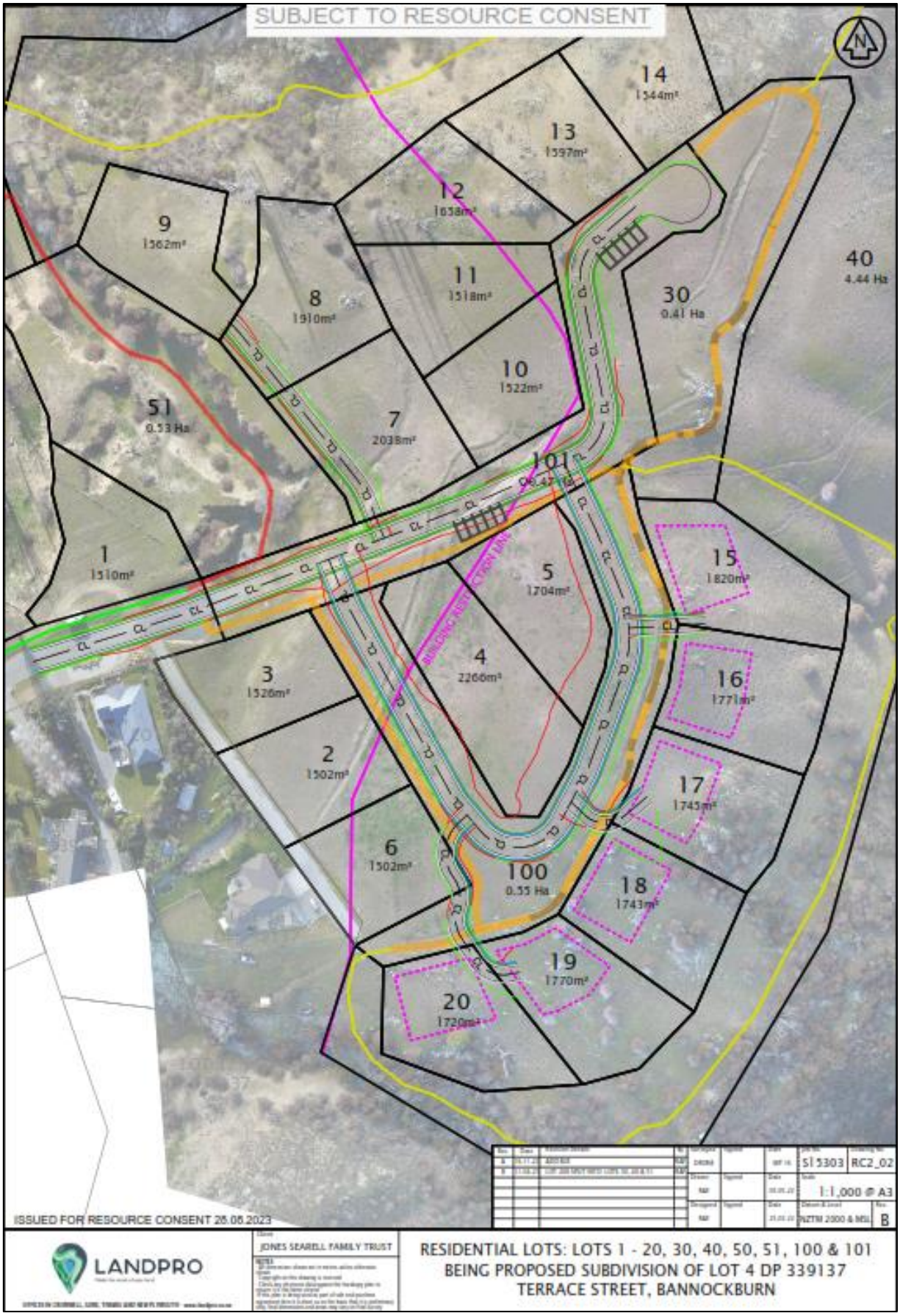


Figure 3 Subdivision plan RC2 01 REV C 2023

Subdivision Design
The subdivision has been designed as an extension of Terrace Street which currently terminates at the western boundary of the Site. The residential lots will be dispersed either side of the road, with the road terminating at a proposed recreation reserve and small car park area.

A short loop road (Lot 100) is located on the southern side of the central road (Lot 100) which will provide access to Lots 2, 6 and 15 to 20.

Formal public access will be provided for on the roads, with the lower of the twin historic water races adaptively recused for path and emergency stormwater events and within the proposed recreation reserve. Informal public access is enabled throughout the balance lots (Lots 40 and 51).

The subdivision comprises the following allotments with their intended functions set:

Lots 1-20: Residential Lots
Lots 1-20 will be freehold lots for residential activity. The lots range in size from 1502m² to 2265m². All lots will have direct access to a road (Lots 100 and 101).

Lots 2, 3 and 6 are located at the southwest boundary of the Site and adjoin existing residential properties at 34 Terrace Street and 36 Terrace Street. Although there is an existing access and right of way easement formed upon the western boundary of the site which provides access to 36 Terrace Street, proposed Lots 2 and 6 (and Lot 3 if desired) will obtain access via the eastern boundary of these lots to a new road. This is to limit the amount of traffic using the existing access and to provide separation from those existing properties and the future dwellings on Lots 2,3 and 6 (while noted that buildings could be built as a permitted activity on Lots 2 and 3).

Lot 30: Recreation Reserve
A 4100m² recreation/local purpose reserve is proposed to be located at the terminus of the Terrace Street Road extension and features the historic recorded latter extents of the upper and lower twin water races F41/369. The reserve will provide amenity, connection to the informal public trail and a lookout area to the north and east towards Cromwell, the wider Upper Clutha area and eastwards towards the Bannockburn Outlet and Surrounds. The reserve will also contain interpretive material associated with the former mining activity, heritage associations and also potentially geomorphic explanations of the Upper Clutha area.

Lot 40: Balance Lot
Lot 40 is a large balance lot 4.44ha in area which for the most part comprises moderate to steep east to north facing slopes. Historically it features Bannockburn commonage and farm steading evidenced by enduring early hardwood post and wire fencing still remaining along the boundary above Shepherds Creek and west up the crest above Revells Gully and down into Revells basin. Inside the hardwood fence line along the eastern boundary is the recorded water race true left Shepherds Creek F41/372 along with small scale sluicing sequences above and below the water race. Around and up into Revells Gully on its true right faces feature further sluicing gulches and beyond the boundary more extensive gold and subsequence coal mining workings. The Surface Hill water races feature here with the lower twin race suppling the sluice gulch workings and likely later coal mining further down in Revells Gully.

The upper twin veers northwest for its likely canvas flume/pipe across Revell's Gorge to the Slaughteryard Hill Reservoir F41/399 servicing the extensive McLellan & Burrows sluicing's and coal pits F41/403 off Slaughter Hill to the east and around into the lower Revell's gorge.

Lot 40 was initially intended to be vested as a local purpose reserve to formalise the existing walking access. Consultation with Council officers in 2022 and early 2023 has revealed that the Council do not want the area to be vested as reserve. Reasons for this are the shortage of flat land for development of formal recreation facilities.

While this is acknowledged, Lot 40 is considered to provide useful walking, amenity and areas for indigenous biodiversity regeneration (both passive regeneration or via restoration).

Because the advice from the Council is that Lot 40 is not suitable for a local purpose reserve, the lot will be retained as a freehold lot by the Applicants. The existing informal walkways within this area will be maintained, however no formal recognition of the walking areas is proposed.

Lot 50: Balance Lot
Lot 50 is a 7.82ha balance lot that is intended for future development. Lot 50 has frontage to Bannockburn Road and is a recorded archaeological site, Revels basin workings F41/385 and the past site of street frontage Stables SO3935.

Within Revell's Gorge, below the bluffs where the gully narrows, there was a schist revetted dam built by Joseph Berry c1875 – c1901 (BHP) for gold mining and later coalmining. Above the bluffs where the gully narrows terraced hand stacked walls of blasted rock remain on the true right bank, being the blasted rock from deepening the gully channel. This was to allow continued gold sluicing and sludge discharge from the extensive sluicing above in the basin head of Revell's Gully. Within Revell's Basin there remains evidence of sluice channels, some cut into bed rock and lined respectively with hand stacked tailings. There are also records of coal prospecting shafts.

Lot 51: Balance Lot
Lot 51 is a 0.53ha balance lot which comprises a recorded archaeological gold workings gully feature F41/368. Entering into Revell's Basin from the south are the northern remnant remains of Pennyweight Sluicing's (F41/368), which have been truncated by the earlier Terrance Road subdivision in the 2000's. The archaeologically recorded remains of the Patterson & Co dam (F41/366) and water race that supplied Pennyweight Sluicing's and Revell's Basin sluicing's (F41/398) along with an unrecorded Terrace St Dam (Location #175 BHP) and schist hut dwelling (Location #412 BHP) were destroyed at the same time.

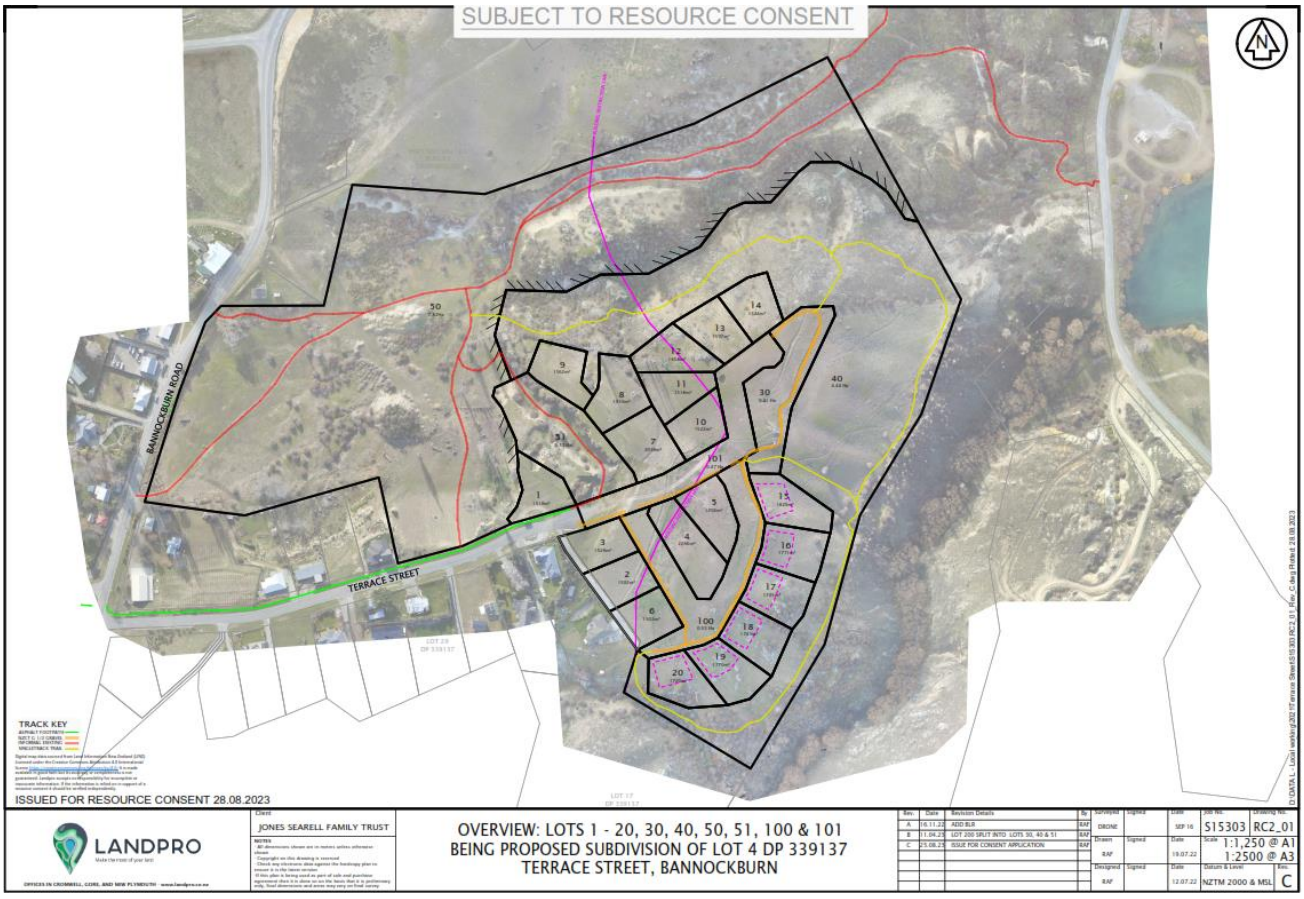


Figure 4 Subdivision design S15303 RC2 01 REV C 2023 for Water Race Hill included in 2023 subdivision application.

The subdivision plans (S15303 RC2 01 REV C) shown in **Figures 3 & 4** are the version that is the basis of this archaeological and heritage impact assessment.

The project team visited the site collectively. Several additional site visits have been completed by individual members of the project team in order to better understand the environmental effects of the proposal and to develop robust

responses to them. In addition, members of the project team have collaborated to ensure that recommendations are feasible and accurately recorded in amended subdivision design plans.

Based on the project team's recommendations, the applicant has decided to make the following changes to the proposal:

a. the number of residential lots included in the proposal has been decreased from 38 to 35 (by removal of original Lots 26, 27 and 32).
b. a portion of original Lot 25, and the entirety of original Lot 26, is now located within Lot 200; and
c. the size of original Lots 27-35 has been increased; and
d. several additions to the proposal in recognition of the archaeological features, as a result of the recommendations made in this report. The specific additions will be discussed in more detail below.

Background to this proposal

2019-2021 Resource Consent RC190154

An application for resource consent was lodged with the Council in April 2019 for a subdivision on the Site comprising 38 lots for residential activity, roads and a reserve lot (3.5.9ha). A copy of the subdivision plan as lodged is in **Figures 5 & 6** below. That application was for a non-complying activity resource consent because the minimum lot size of 1500m² and average lot size of 2000m² was not achieved.

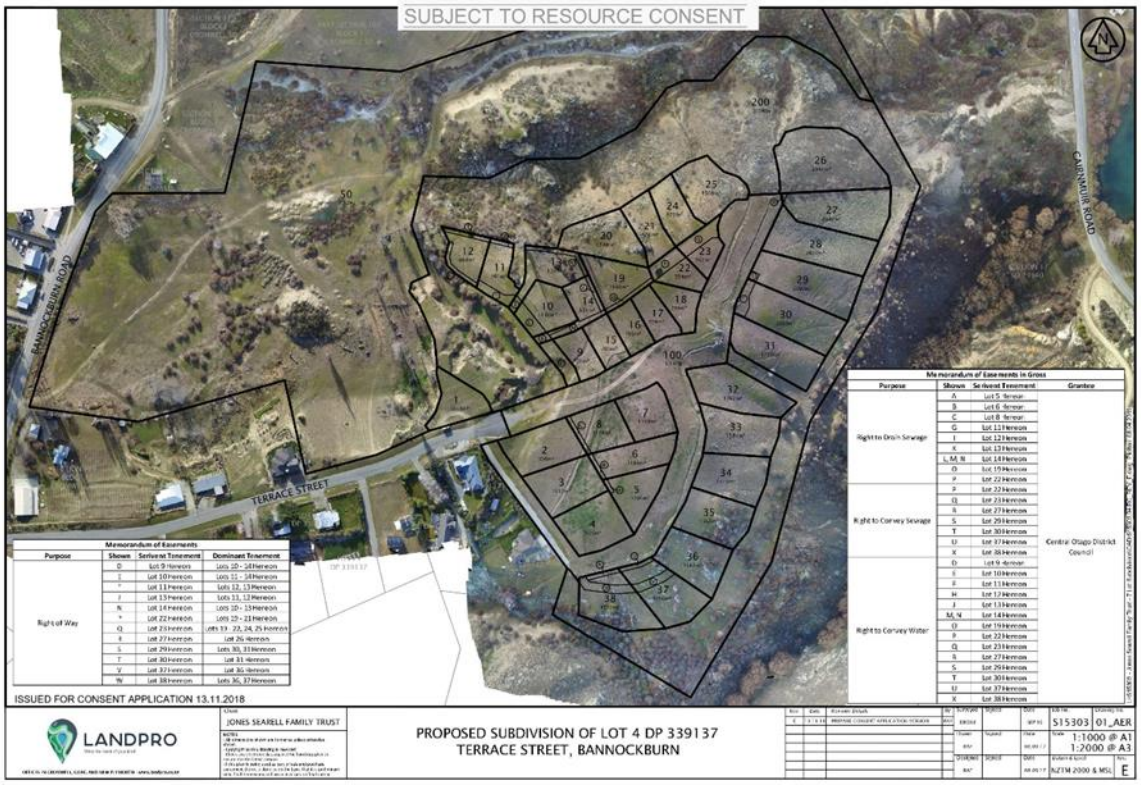


Figure 5 Subdivision plan from RC190154 Rev E (application as lodged) April 2019.

In May 2021 the applicant responded to an information request with revised assessments and revised application material, including reducing the proposal from 38 lots shown in Figure 5 above, to 35 lots. The application was processed on a public notified basis and attracted over 100 submissions. The application has been on hold since the close of the submission period.

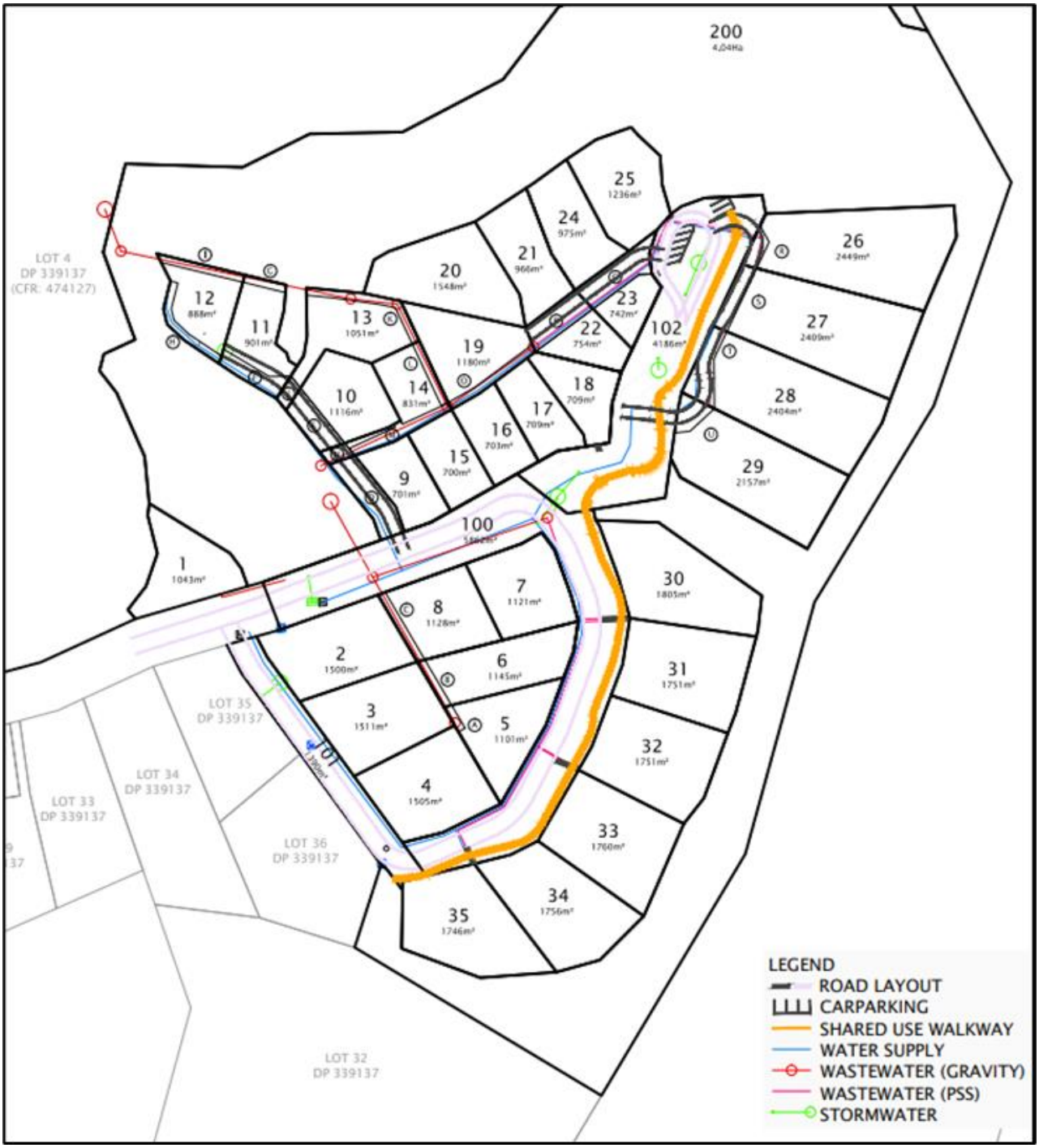


Figure 6 Subdivision plan from RC190154 (application as notified for submissions).

2022 – 2023 Redesign

The applicant and its project team has considered the feedback received through the submissions, sought feedback on alternative subdivision design configurations with the owners of 34 Terrace Street and 36 Terrace Street, and undertaken meetings and received feedback from Council officers on the reserve design and vesting options, and advice from a peer review of the notified application documents by the Council's consultant landscape architect.

The revised proposed subdivision has taken on board feedback and comprises the following elements relative to the previous proposal:

- The minimum lot size of 1500m² and average lot size of 2000m² has been achieved, this complies with the anticipated residential density of the RRA (4) zone.
- An originally proposed road located along the western boundary of the site adjoining 34 and 36 Terrace Street has been removed. The existing access and right of way will not be affected and access

will be via a road located on the northern side of Lots 2, 3 and 6. There are no new vehicle access rights at this location.

- Lots 5-8 as shown in Figure 6 have been removed providing greater visual relief to the existing properties on the southern side of Terrace Street.
- RC190154 would have resulted in 24 dwellings within the BLR. This application would result in 12 dwellings within the BLR (8 lots entirely within the BLR and 4 lots partially within the BLR). Those 12 dwellings located within the BLR area but will be subject to controls limiting building height, location, coverage and colours and materials.

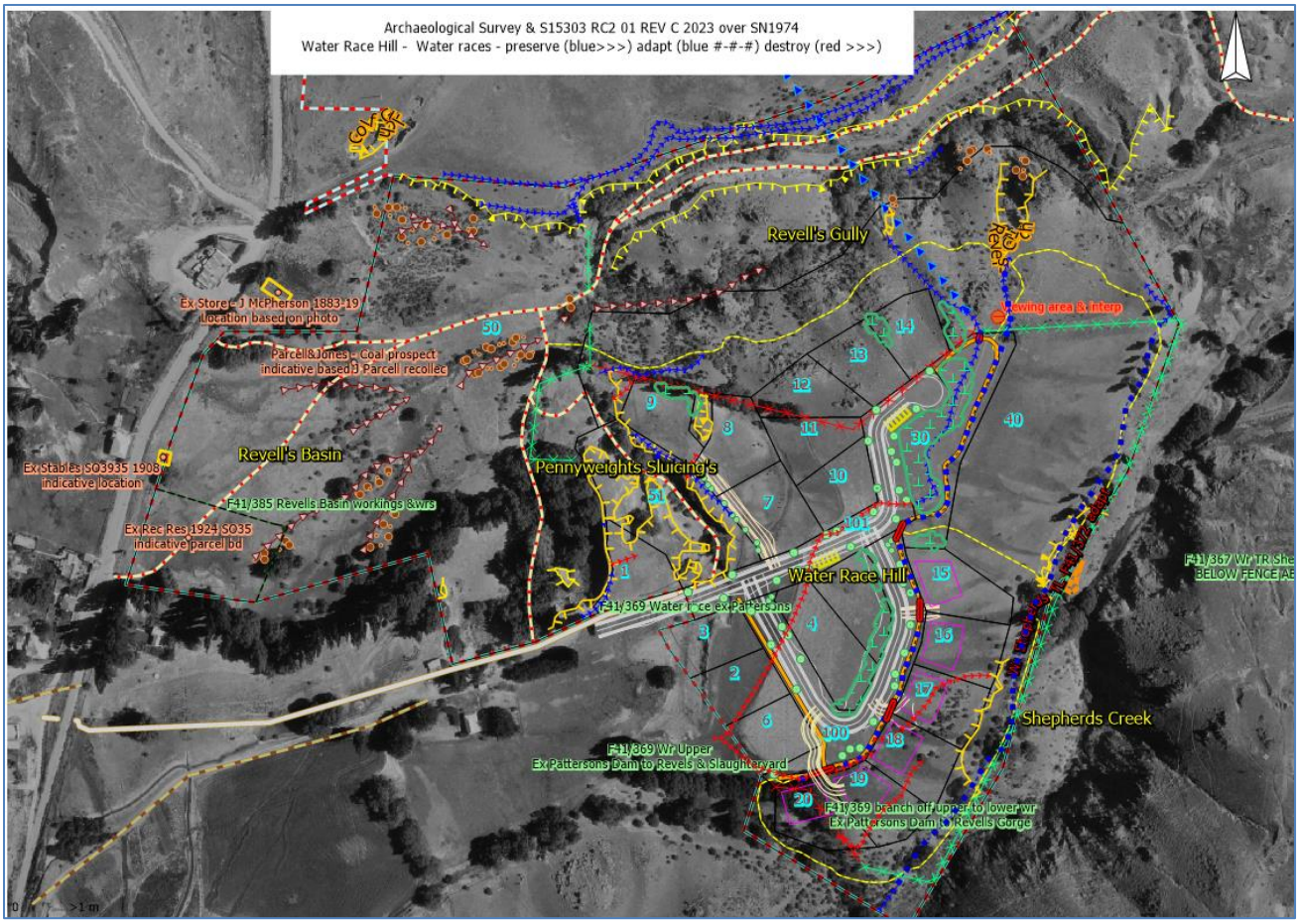


Figure 7 Archaeological survey and assessment of archaeological impacts based on subdivision plan RC2 01 REV C over 1974 LINZ aerial. Refer Appendix 1 for more detail plans, site photographs, survey plans and further supporting material.

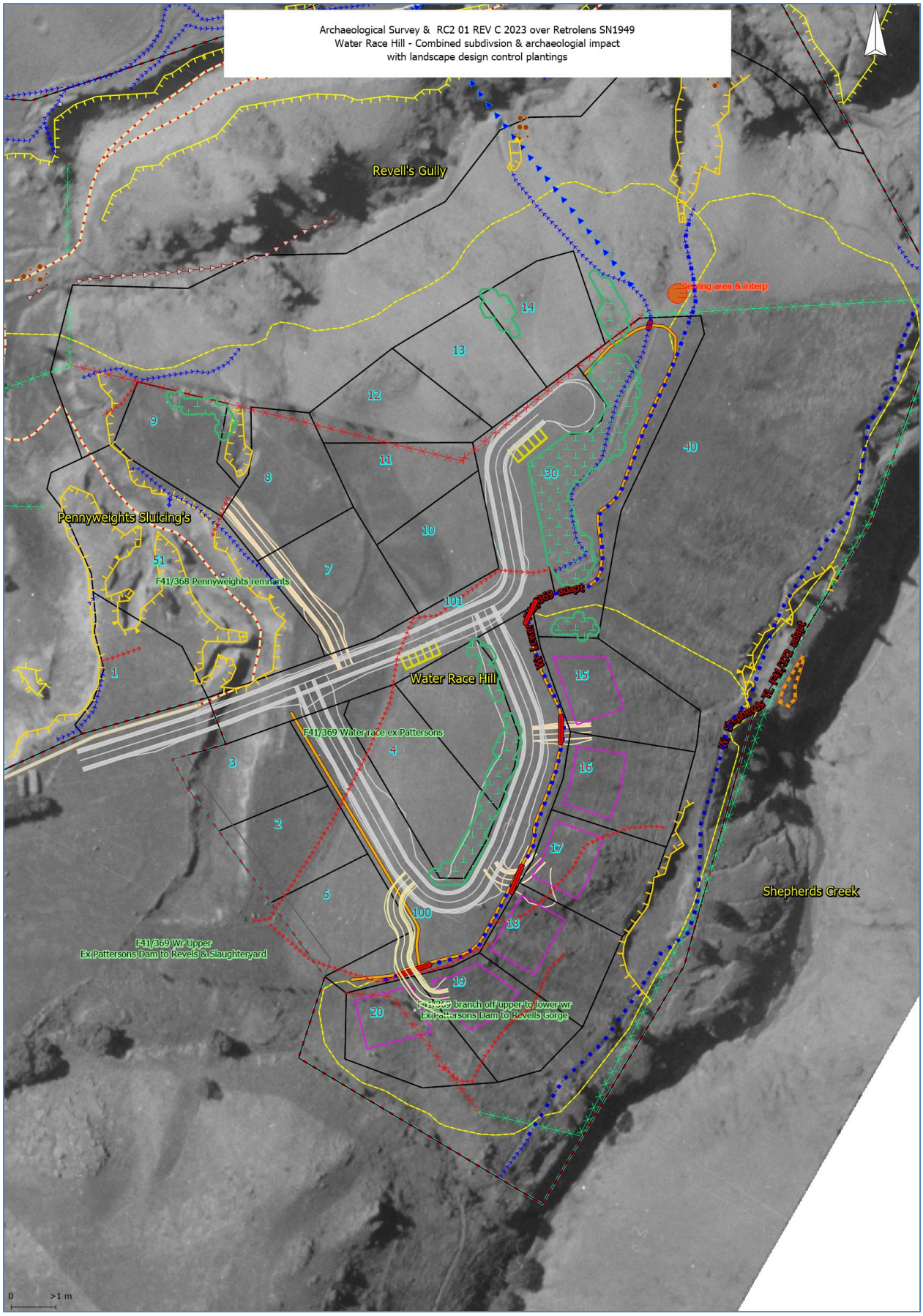


Figure 8 Archaeological survey and assessment of archaeological impacts based on subdivision plan RC2 01 REV C over SN1949 aerial Water Race Hill - Combined subdivision & archaeological impacts with landscape design control plantings.

Legal description/appellation of land affected.

The legal description of the land affected is Lot 4 DP 339137 (referred to throughout as the "Water Race Hill land").

Work (and date) of assessment undertaken and by whom.

To complete this assessment, I have (Kopuwai Consulting) undertaken the following work:

- Three archaeological surveys involving an
    - Initial survey of a portion of Lot 4 proposed for a 9-lot subdivision Landpro RC S15303 dated 3 10 2016 over what is named 'Water race hill' on 7 July 2016, which identified the remnant remains of NZAA recorded sites and an array of unrecorded features relating to goldmining; coalmining; farm steading.
    - A wider heritage landscape survey beyond the Stage 1 Water Race Hill subdivision proposal involving the remainder of Lot 4 and all of Part Sect 103 owned by Jones Searell Family Trust was undertaken on 28 March 2017 which located the remnant remains of the recorded sites of water races: reservoir and Chinese dwelling and garden site. A significant discovery from remnants water race abutments either side of Revell's Gully was the operation of a likely canvas piped flume that would have been the constructed solution to conveying water between Water Race Hill and Slaughteryard Hill across Revell's Gorge to the Slaughteryard Hill Reservoir servicing the sluicing's off Slaughter Hill to the east and around into the lower Revell's gorge.
    - A follow up archaeological survey for an assessment of effects of the subdivision plan Rev E on the remaining above ground archaeological sites and values on 31 August 2018. This revealed hand stacked tailings, schist boxed sluicing's; rock blasted sludge channel with stacked rock walling from the blasted waste; artefact scatters from early occupation; sluice gulches; and coalmining features and artefacts along with sites from early Bannockburn establishment.

- A few project planning and stakeholder onsite visits were undertaken as well as part of the design and planning stages as various iterations of the subdivision proposal evolved.

- In Jan 2021 Heritage NZ Area Manager Jane McKnight and Otago Southland Archaeologist Nikole Wills accompanied by Kopuwai Consulting Archaeologist and Trustee Doug Jones were given a site visit over the Water Race Hill Rev H and the adjacent Jones Searell parcel known as Slaughteryard Hill where the setting and context for the Rev H subdivision could be viewed in relation to the Bannockburn main street, its remaining heritage buildings, the wider settlement and Revell's Sluiced basin and Gully down to the Bannockburn Inlet and its amenity values.

- The Archaeological Assessment has determined an Archaeological Authority Application is required as while the new subdivision RC2 01 REV C 2023, aligned roading, water, waste and stormwater services, residence and associated services installation will, with marking archaeological features and sensitive earthworks and construction, preserve the majority of the above ground features, some water race and historic fence line components and other minor gold mining elements will be adaptively repurposed, and or disturbed, and destroyed, triggering the requirement of an archaeological authority application.

- While the priority for the archaeological authority has been pre-1900's there has been an RMA historic heritage assessment effects on post-1900 historic heritage for the land parcels. In more recent years Doug Jones has grazed the Water Race Hill land and reutilised the water races for wild flood irrigation. Between Water Race Hill and Bannockburn Road southwest of the subdivision, 1980's development has led to:

    - the loss of recorded sites F41/366 Patterson & Co Dam – Ridlands 1890 map.
    - modification & loss of 45% of Pennyweights sluicing's F41/368.

- Loss of a section of water from Patterson & Co Dam servicing the sluicing's in Pennyweights Sluicing's F41/368; Revell's Basin and Gully F41/385 & F41/795 and the workings off Slaughteryard Hill and later Colleries F41/403 & F41/301.
- Damage to sluice faces on the south side of Revell's Basin F41/385 & F41/795 and burial sluice channels and tailings within the Revell's sluicing's from road cut spoil stock piling from the redeveloped access into Bannockburn required as part of the Lake Dunstan impoundment.
- CODC stormwater and waste infrastructure installed down through Pennyweights Sluicing has likely destroyed schist lined boxed sluice channels and has damaged and destroyed hand stacked tailings, fencing and sludge channel draining the Revell's Basin sluicing's. Recent upgrades caused further impacts on these recorded archaeological features and sites.

Brief background section to include any information relevant to this assessment. e.g. any issues/occurrences which lead to this assessment being commissioned; previous reports relating to this assessment and area affected.

The area was surveyed in Feb 1982 by Neville Ritchie archaeologist for the Clutha Valley Hydro Development project recording on New Zealand Archaeological Site recording database 8 recorded archaeological sites across Lot 4 Deposited Plan 339137 and Pt Sec 103. These were referenced in the 2016 – 2017 archaeological surveys associated with the Trusts Bannockburn parcels. The recorded historical sites were:

- F41-368 S133-808 Lower Remains Pennyweight Gully Sluicing's
- F41-369 S133-809 Upper Water race from F41/366 Patterson & Co Dam to a branch servicing F41-368 Pennyweights Sluicing's and a branch to the Lower Water Race Hill race servicing small sluicing's of water race hill and beyond to a sluice gulch down in Revell's Gorge. The Upper Water Race Hill race continues to F41-385Revell's Gully and via a past flumed pipe over Revell's Gorge to F41-399 Slaughteryard Hill Reservoir via F41-398 Slaughteryard Hill reservoir race to F41-403 NE Slaughteryard Hill Sluicing area and coal pits – now modified extensively by gravel quarry & sewage pond and via a shallow branch water race supplying F41-394 Chinese occupation site.
- F41-372 S133-812 water race TL above Shepherd's Creek below Lot 4 Water Race Hill eastern boundary - servicing workings in Revell's Gully & Shepherd's Creek & later Collieries
- F41-385 S133-825 Revell's Basin workings, Sludge Channels, dams, tailings, and dual water races on north side of the basin below Slaughteryard Hill
- F41-394 S133-835 Slaughteryard Hill Chinese Hut and occupation site & artefacts
- F41-398 S133-839 Slaughteryard Hill reservoir race to F41-399 Slaughteryard Hill Reservoir serviced by canvas fluming from F41-366 Patterson & Co reservoir.
- F41-399 S133-840 Reservoir Slaughteryard Hill
- New site records for farmstead/commonage fencing ex Section 40 SO_3081 June 1915 _Sect 40 (Water Race Hill) surveyed for Ellen Taylor married to Jack Taylor miner, carter & mail Contractor 1878 - 1937.
- New site records for various colliery sites off Revell's Gully and Slaughteryard Hill & Shepherd's Creek as recorded on Bannockburn History project Map Sheet 6 #s 185, 189, 502, 186, 187– Paul Crump & various early mining plans SO3929 Coal Lease Sect 80 John Hodson 1910, SO3939 Coal Lease Sect 85 E J McCabe & G Crabbe 1912, SO3940 Coal Lease Sect 86 & 38 J Gordon H Russel R Robertson Ellen M Gibson 1912, SO3941 Coal Lease Sect 87 Ellen Mary Gibson 1912.
- New site record for Slaughteryard Hill lower twin races likely extensions off F41/812 to include lineal reservoirs servicing sluice workings and later collieries down into Bannockburn Inlet ex Revell's Gully Shepherd's Creek Bannockburn Creek.
- Site record update for F41/369 to include the lower water race (proposed for adaptive reuse an active path) on Water Race Hill as a branch of the upper water from Patterson & Co reservoir F41/366

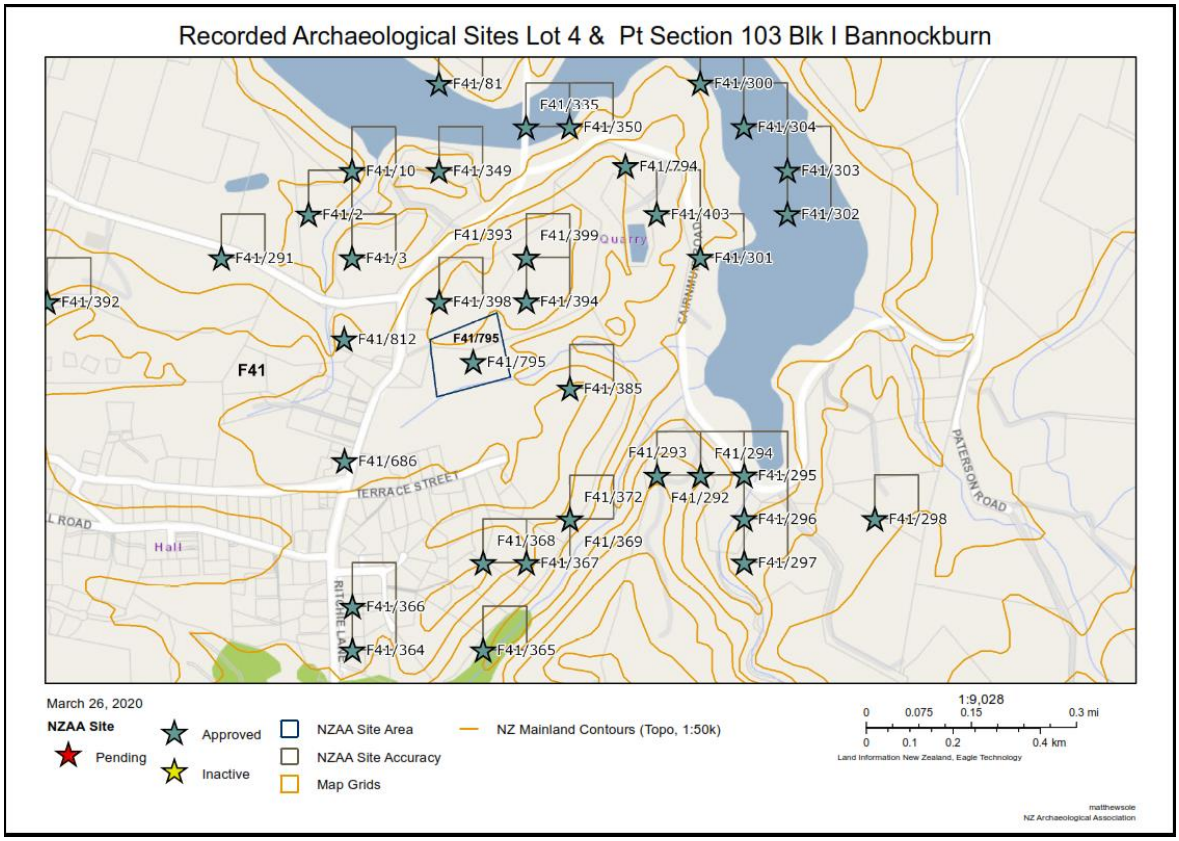


Figure 9 Map of NZAA wider view recorded sites on and around Terrace St – Lot 4 DP339137 Water Race Hill & Pt Section 103 Slaughteryard Hill – March 2020



Figure 10 Google aerial –Lot 4 DP339137 Terrace Street Bannockburn; Water Race Hill Subdivision proposal with recorded archaeological sites shown – Kopuwai Archaeology March 2021

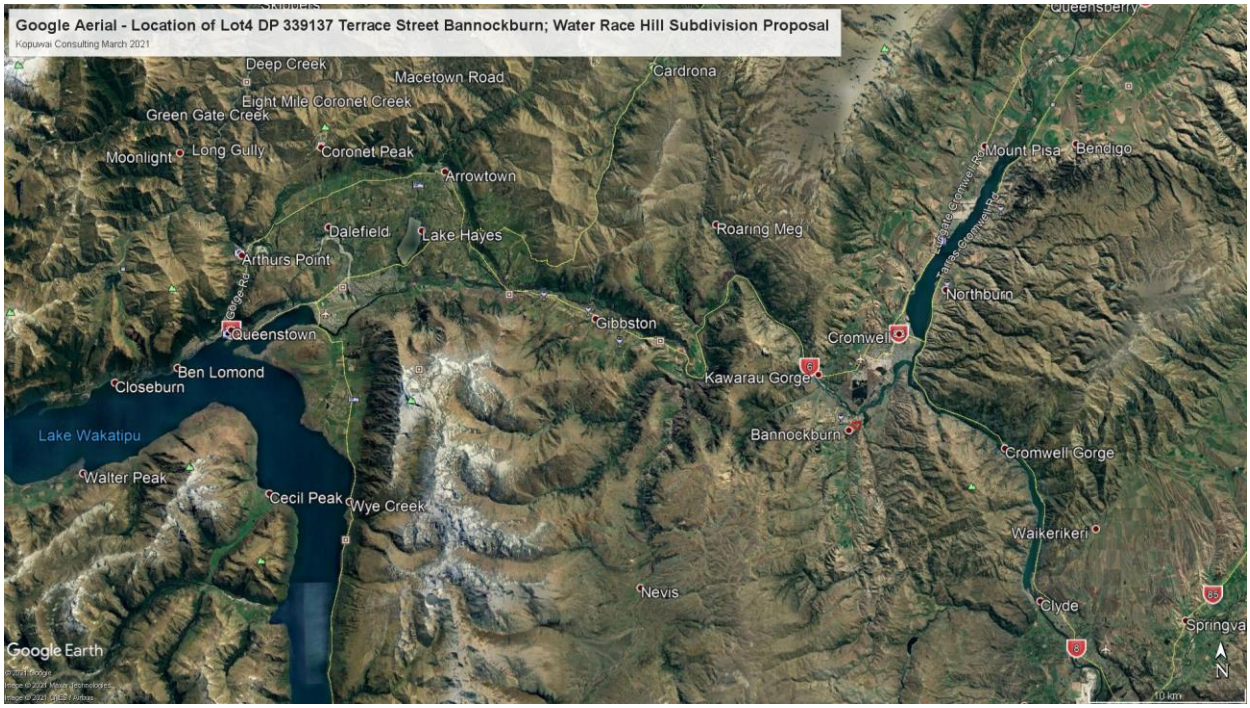


Figure 11 Google aerial – red circle locates Lot 4 DP339137 Terrace Street Bannockburn; Water Race Hill Subdivision proposal – Kopuwai Archaeology March 2021

Statutory Requirements

There are two main pieces of legislation in New Zealand that control work affecting archaeological sites. These are the *Heritage New Zealand Pouhere Taonga* Act 2014 (HNZPTA) and the *Resource* Management Act 1991 (RMA). This report provides an assessment of the proposal against both enactments.

Heritage New Zealand Pouhere Taonga Act 2014

Heritage New Zealand administers the HNZPTA. It contains a consent (authority) process for any work affecting archaeological sites, where an archaeological site is defined as:

Any place in New Zealand, including any building or structure (or part of a building or structure), that -

a. Was associated with human activity that occurred before 1900 or is the site of the wreck of any vessel where the wreck occurred before 1900; and

b. Provides or may provide, through investigation by archaeological methods, evidence relating to the history of New Zealand; and

c. Includes a site for which a declaration is made under section 43(1)

Any person who intends carrying out work that may modify or destroy an archaeological site, must first obtain an authority from Heritage New Zealand. The process applies to sites on land of all tenure including public, private and designated land. The HNZPTA contains penalties for unauthorised site damage or destruction.

The archaeological authority process applies to all archaeological sites, regardless of whether:

- The site is recorded in the NZ Archaeological Association Site Recording Scheme or included in the Heritage New Zealand List,
- The site only becomes known about as a result of ground disturbance, and/ or
- The activity is permitted under a district or regional plan, or a resource or building consent has been granted.

Heritage New Zealand also maintains the New Zealand Heritage List/ Rarangi Korero of Historic Places, Historic Areas, Wahi Tupuna, Wahi Tapu and Wahi Tapu Areas. The List can include archaeological sites. Its purpose is to inform members of the public about such places.

Archaeological sites are protected under Section 42 of the HNZPTA, and it is an offence to carry out work that may "modify or destroy, or cause to be modified or destroyed, the whole or any part of that site if that person knows, or ought reasonably to have suspected, that the site is an archaeological site", whether or not the site has been previously recorded. Each individual who knowingly damages or destroys an archaeological site without having the appropriate authority is liable, on conviction, to substantial fines (Section 87).

Any person wishing to carry out work on an archaeological site that may modify or destroy any part of the site, including scientific investigations, must first obtain an authority from Heritage New Zealand (Sections

44(a), (c)). The HNZPTA stipulates that an application must be sought even if the effects on the archaeological site will be no more than minor as per Section 44(b). A significant change from the Historic Places Act (1993) is that "an authority is not required to permit work on a building that is an archaeological site unless the work will result in the demolition of the whole of the building" (Section 42(3)).

Heritage New Zealand will process the authority application within five working days of its receipt to assess if the application is adequate or if further information is required (Section 47(1)(b)). If the application meets the requirements under Section 47(1)(b), it will be accepted and notice of the determination will be provided within 20 to 40 working days. Most applications will be determined within 20 working days, but additional time may be required in certain circumstances. If Heritage New Zealand requires its own assessment of the Maori values for the site, the determination will be made within 30 working days. If the application relates to a particularly complex site, the act permits up to 40 days for the determination to be made. Heritage New Zealand will notify the applicant and other affected parties (e.g., the land owner, local authorities, iwi, museums, etc.) of the outcome of the application.

Once an authority has been granted, modification of an archaeological site is only allowed following the expiration of the appeals period or after the Environment Court determines any appeals. Any directly affected party has the right to appeal the decision within 15 working days of receiving notice of the determination. Heritage New Zealand may impose conditions on the authority that must be adhered to by the authority holder (Section 52). Provision exists for a review of the conditions (see Section 53). The authority remains current for a period of up to 35 years, as specified in the authority. If no period is specified in the authority, it remains current for a period of five years from the commencement date.

The authority is tied to the land for which it applies, regardless of changes in the ownership of the land. Before any changes of ownership, the landowner must give notice to Heritage New Zealand and advise the succeeding landowner of the authority, its conditions, and terms of consent.

An additional role of Heritage New Zealand is maintaining the New Zealand Heritage list, which is a continuation of the Register of Historic Places, Historic Areas, and Wahi Tapu Areas. The list can include archaeological sites. The purpose of the list is to inform members of the public about such places and to assist with their protection under the RMA (1991).

Resource Management Act 1991

The RMA requires City, District and Regional Councils to manage the use, development, and protection of natural and physical resources in a way that provides for the wellbeing of today's communities while safeguarding the options of future generations. The protection of historic heritage from inappropriate subdivision, use, and development is identified as a matter of national importance (section 6f).

Historic heritage is defined as those natural and physical resources that contribute to an understanding and appreciation of New Zealand's history and cultures, derived from archaeological, architectural, cultural, historic, scientific, or technological qualities.

Historic heritage includes:

- historic sites, structures, places, and areas
- archaeological sites;
- sites of significance to Maori, including wahi tapu;
- surroundings associated with the natural and physical resources (RMA section 2).

These categories are not mutually exclusive, and some archaeological sites may include above ground structures or may also be places that are of significance to Maori.

Where resource consent is required for any activity the assessment of effects is required to address cultural and historic heritage matters (RMA 4th Schedule and the district plan assessment criteria).

RMA historic heritage is defined as those natural and physical resources that contribute to an understanding and appreciation of New Zealand's history and cultures, derived from archaeological, architectural, cultural, historic, scientific, or technological qualities.

Historic heritage includes:
- historic sites, structures, places, and areas
- archaeological sites.
- sites of significance to Maori, including wahi tapu.
- surroundings associated with the natural and physical resources (RMA section 2).

These categories are not mutually exclusive, and some archaeological sites may include above ground structures or may also be places that are of significance to Maori.
Where resource consent is required for any activity the assessment of effects is required to address cultural and historic heritage matters (RMA 4th Schedule and the district plan assessment criteria).

The Resource Management Act 1991 requires local authorities to develop and operate under a district plan.

District Plan provisions relevant to historic heritage

Table 1 Summary of CODC operative plan 2008 Heritage objectives & polices.

CODP Chapter	Objective/Policy
	14.3.4 Objective – Archaeological Sites *To recognise and provide appropriate protection for the values associated with the district's*

Heritage Buildings, Places, Sites, Objects and Trees Chapter	*archaeological sites.*
	14.4.6 Policy – Archaeological Sites *To provide for the conservation of values associated with the district's archaeological sites by:* *(a) Identifying such registered sites, on the planning maps.* *(b) Ensuring that works carried out within or near such sites recognise and provide for their values where appropriate.* *(c) Requiring an assessment of the values associated with any such sites as part of any subdivision or land use consent in circumstances where a significant adverse effect may result, and requiring protection where such values are considered to be significant.*
Subdivision Chapter	16.3.6 - Objective - Heritage Values *To ensure that subdivision does not facilitate development that may adversely affect heritage and cultural values including cultural values of importance to Kai Tahu ki Otago.*
	16.4.7 - Policy - Subdivision Design *To require that the design of subdivision, where relevant to the intended use, provides for the following matters:* *(h) Facilitates retention of the heritage values of a site or area.*

The Operative CODC District Plan (the **District Plan**) recognises that the district has a wealth of heritage items and precincts that are an important part of the area's amenity and character. Activities that affect properties within heritage precincts or heritage items are evaluated against the rules outlined in Section 11, heritage precincts, and Section 14, heritage buildings, places, sites, objects and trees.

The District Plan register includes heritage buildings, places, sites, objects and trees that are recognised as being significant to the heritage of the district, and their inclusion on Schedule 19.4 affords them protection while encouraging their continued use, adaptive reuse, and development. The rules relating to these heritage items are outlined in Section 14 of the District Plan. The register includes all Heritage New Zealand Category 1 and Category 2 listed sites, which have been evaluated according to criteria outlined in the HNZPTA. Listed items in the District Plan are discussed below in section containing the Heritage Impact Assessment.

Outlined below are the heritage features and values across the Trust's parcels Lot 4 DP339137 and Part Sec 103 and neighbouring land where heritage features on the Trust's land are related and connected as heritage systems. This assessment of surveyed heritage pre and post 1900 assesses the impacts of the Water race hill subdivision on the remaining heritage features and values and provides an assessment of effects with recommendations to inform the Resource Consent and archaeological authority.

Some of the historic elements on the site include:

- Water races.

- Sluice faces; Sluice gulches
- Sludge Channels.
- Tailings – stacked & revetted and
- Old hardwood post and wire fence lines.
- Coal pits prospects & underground measures
- Old flume site – Revell's Gully
- Dams/reservoirs
- Locations of past historic store & stables
- Ex public reserve and Bannockburn Commonage
- Artefact scatters

The features are of mining, farm steading and Bannockburn commonage and early town service origins. Past early survey plans record sites of past recreation reserve Sec 123(SO356) 1924 *Appendix Figure 25,* Ex Stables (SO3935) 1908 *Appendix Figure 27*.

Archaeological Association recorded sites on Arc Site

The heritage associated and connected with Lot 4 Water Race Hill & Part Sect 103 land includes 16 NZ Archaeological Association recorded sites. Asterisked sites 4* are directly related to Water Race Hill RC2 01 REV C 2023 subdivision and are all pre 1900 sites as defined by the HNZ Act.

These are sites associated with human activity that occurred before 1900 and provides or may provide, through investigation by archaeological methods, evidence relating to the history of New Zealand.

Table 2 of recorded archaeological sites associated with Lot 4 & Part Sec 103, with * sites specific to Water Race Hill Subdivision

	NZAA_ID	IMPERIAL	NAME	ShortDescr	SiteType	SiteFeature
1	F41/403	S133/844	NE Slaughteryard Hill	Sluicing area/coal pits	Mining - gold	Sluicing's/ coal pits
2	F41/366	S133/806	Patterson & Co Reservoir	Dam	Industrial	Dam
3	F41/369*	S133/809	Upper & Lower Twin Water Races- Water Race Hill Race – with a branch race to Pennyweights sluicing's, the upper branch race Revell's Gully & Slaughteryard Hill and branch to Lower Water Race Hill to Revell's Gorge sluicing's	Water races	Industrial	Water race
4	F41/372*	S133/812	Shepherd's Ck TL above Gorge Lot 4	Water race	Industrial	Water race

5	F41/301	S133/691	Slucings/sluice faces Ex TL Bannockburn Ck	Sluiced area/coal drives	Mining - gold & coal	Sluicing's/ sluicing face
6	F41/367	S133/807	Shepherd's Ck TR high	Water race	Industrial	Water race
7	F41/292	S133/667	Shepherd's Ck low wr & dam	Water race/dam	Industrial	water race/dam
8	F41/393	S133/834	NW Slaughteryard hill	Water race	Industrial	Water race
9	F41/399	S133/840	Slaughteryard Hill Reservoir	Mining dam	Industrial	Dam
10	F41/794		Slaughteryard Hill Antimony Smelter Chimney Flue	Remnants of schist-lined chimney flue & smelter of the Carrick Range Antimony Company constructed in the 1880s.	Industrial	Chimney
11	F41/385*	S133/825	Revell's Basin Sluicing's & water races	Ground sluicing/water races	Mining - gold	Sluicing's/ sluicing face/water races
12	F41/795*		Revell's Gorge	Revell's gorge is a broad sludge channel with several features such as short tail races, old sluicing's, and piles of tailings, with sluice faces on the N side. Water races on Slaughteryard Hill lead to these faces.	Mining - gold	Tailings, Water race - tail race, Mining workings, Sluicing's/ sluicing face
13	F41/368*	S133/808	Pennyweights Sluice Gully	Sluice gully	Mining - gold	Sluicing's/ sluicing face
14	F41/394	S133/835	Slaughteryard Hill hut & occupation site	Hut site	Historic - domestic	Hut floor/ site/water race
15	F41/365	S133/805	Shepherd's Ck TL Tailings	Tailings/drive	Mining - gold	Tailings/drive
16	F41/398	S133/839	Slaughteryard reservoir race	Water race	Industrial	Water race

The various effects of the Lot 4 Water Race Hill RC2 01 REV C 2023 subdivision proposal on the recorded and unrecorded lower twin race and early fencing are described and assessed within this assessment.

Unrecorded archaeological sites/features

New sites records are pending for:

- New site records for (Water Race Hill) farmstead/commonage fencing ex Section 40 SO_3081 June 1915 _Sect 40 (Water Race Hill) surveyed for Ellen Taylor married to Jack Taylor miner, carter & mail Contractor 1878 – 1937 source BHP.
- New site records for various colliery sites off Revell's Gully and Slaughteryard Hill & Shepherd's Creek as recorded on Bannockburn History project Map Sheet 6 #s 185, 189, 502, 186, 187– Paul Crump & various early mining plans SO3929 Coal Lease Sect 80 John Hodson 1910, SO3939 Coal Lease Sect 85 E J McCabe & G Crabbe 1912, SO3940 Coal Lease Sect 86 & 38 J Gordon H Russel R Robertson Ellen M Gibson 1912, SO3941 Coal Lease Sect 87 Ellen Mary Gibson 1912.
- New site record for Slaughteryard Hill lower twin races likely extensions off F41/812 to include lineal reservoirs servicing sluice workings and later collieries down into Bannockburn Inlet ex Revell's Gully Shepherd's Creek Bannockburn Creek.
- Site record update for F41/369 to include the linked lower water race (proposed for adaptive reuse an active path) on Water Race Hill as a branch of the upper water race from Patterson & Co reservoir F41/366

Table 3 of new unrecorded archaeological sites/features associated with Lot 4 & Part Sec 103

New Unrecorded Sites				
Location	Name	ShortDescr	Site Type	Site Feature
Water race Hill*	Historic fence	Hard wood post & wire	agriculture	Fence posts & wire
Various	Collieries	Coal mine – tunnels & processing	Mining	Tunnel, Shafts, Processing site remains
Slaughteryard Hill	Twin water races & lineal reservoir	Water races & lineal reservoir	Mining	Water races – enlarged water races

The collieries/coalmining sites are largely post 1900 and are managed under the RMA Act heritage provisions administered by CODC.

Being recorded on the Arch Site will provide an alert to CODC planning and any activity potentially affecting these sites and should trigger an assessment of effects to address cultural and historic heritage matters. Referenced in the Appendix 1 for Local Authority best practise in the management of post 1900 RMA Heritage is the Parliamentary Commissioner for the Environment Te Kaitiaki Taiao a Te Whare Paremata -Historic and Cultural Heritage Management Local Authority Good Practice Guide.

The Lot 4 Water Race Hill RC2 01 REV C 2023 subdivision proposal, while adjacent to Revell's Gully and Shepherd's Creek coal lease sites and potentially above some of the coal mine adits, no direct physical effect or connection to them apart from the upper Water Race Hill race F41/398 which by flume/pipeline serviced McLellan& Burrow Sluicing's and subsequent coal pits off the astern faces of Slaughteryard Hill across Revells gully F41/403 and via the Shepherd's Creek water race along the bottom boundary F41/372 that is likely to have serviced the various Collieries in and around Revell's Gully and Shepherd's Creek. There are also records of ventilation shafts from adits off Slaughteryard Hill. In relation to Water Race Hill no above ground surface evidence of ventilation shafts was observed.

Methodology - Archaeological Survey

The Archaeological Survey of Water Race Hill was carried out using both desk-top research methods and an on-site survey of the proposed parcels for subdivision and its immediate environs and features. The desk-top assessment involves consulting a wide range of archival sources to try to illuminate the historical development and chronology of the history and its associated heritage values. The assessment used the following sources to identify the origins and use of the water race:

- 19th century surveyors' maps.
- Land titles and land transfer surveys (LINZ).
- Aerial photographs 1949 SN533_F_39_31304 & 1974 SN3778_C_ 13 (retrolens) LINZ aerial CC12_0310 2014 - (LINZ).
- Photographic and documentary archives (on-line archive repositories - Archives NZ, Digital NZ, National Library of NZ, Papers Past; Ron Murray Historic Image Library Collection
- Local Bannockburn/Central Otago histories and similar publications.
    - Bannockburn Heritage Landscape Study by Janet Stephenson, Heather Bauchop & Peter Petchey.
    - Heart of the Desert by James Crombie Parcell.
    - The Bannockburn History Project by Paul Crump.
- NZAA ArchSite.
- Archaeological Assessment Reports.
    - Archaeological assessment for Lake Dunstan Trail – Clyde to Cromwell via Bannockburn on south side Lake Dunstan for Central Otago Queenstown Trail Network Trust 2018 by Matthew Sole Kopuwai Consulting 2018; and
    - Heritage Assessment Bannockburn Sluicing's Historic Reserve by Peter Petchey Southern Archaeology Ltd 2016.
    -

Three archaeological field surveys and three follow up site visits have been undertaken between 2016 and 2021 and resulting from the 2022 – 2023 subdivision redesign a desktop review has been made based on new resource consent application and plan RC2 01 REV C 2023 and this revised Heritage Impact Assessment prepared.

The use of spatial data (shapefiles from Landpro of various subdivision design revisions along with Rough & Milne Landscape design) & GPS survey waypoints and tracks; NZAA site records; landform data; archaeological features have been spatially mapped in Manifold 8 Geographic Information system.

This has allowed the Water Race Subdivision designs with geographic and existing and destroyed modified archaeological features to be displayed and mapped for identifying surface archaeological features and sharing across the project parties and clients.

The early mapping and sharing of spatial data have been key to informing the design needs for the subdivision and the sensitive and informed subdivision design around the remaining historic features.

Plans, spatial data and spreadsheet tables were prepared and updated associated with respective subdivision revisions, identifying the subdivision parcels and requiring protection measures for archaeological features within the respective parcels along with parcels with archaeological features requiring an archaeological authority to modify and or destroy.

This has worked with reciprocity in subdivision design and archaeological assessment and heritage preservation and management.

The spatial database has georeferenced current and early 1949 & 1974 aerials which allow visual assessment of the project land use and it's the wider heritage landscape change over time and visual reference to archaeological site and features and their change and condition over time.

It facilitates a wider landscape approach to heritage preservation and management informing future land use and sensitive lying down of new cultural layers. By way of informed sensitive design to preserve identified

significant heritage and adaptive reuse of suitable elements within informed consent for modification and or recorded destruction were deemed appropriate or unavoidable.

Following several subdivision design revisions through project party collaboration, with stakeholders in general agreement, Heritage NZ (HNZ) Otago Southland Area Manger Jane McKnight and regional HNZ archaeologist Nikole Wills were hosted on a guided site visit. This was with project archaeologist Matt Sole and trustee Doug Jones on the 20 Jan 2021 to gain an understanding of the refined subdivision proposal and a feel for the remaining heritage and landscape values and setting of the site and within Bannockburn and the wider Cromwell basin.

The 2022 – 2023 subdivision design RC2 01 REV C 2023 is archaeologically slightly lighter in footprint and effects so no further (HNZ) site visits have occurred. However due to staff changes within (HNZ) there would be merit in renewed consultation and an invitation to revisit the project site prior to engaging in the archaeological authority process, noting they are an affected party in this RC application and will receive this HIA.

Physical Environment or Setting

Description of natural landscape and the context of the affected area within it. *e.g. geology, topography, climate, vegetation, streetscape, curtilage, aspect and prevailing wind*

The area lies within a distinctive landscape featuring the Cairnmuirs to the east, the Old Woman Range to the south and the Carrick Range and Mt Difficulty to the west with the Pisa Range to the north basically encircling the site and Bannockburn.

The southern portion of Lot 4 sits on a gentle spur with Shepherd's Creek on the southeast side and Revell's Gorge and Revell's Basin incorporated and forming the northern boundary and with part sect 103 which is a peninsular featuring Slaughteryard Hill bounded by Bannockburn Inlet to the east previously Bannockburn Creek before inundation and likewise the Kawarau Arm to the north previously the Kawarau River and rapids. Bannockburn Road and Town form the west boundary for both.

The underlying strata is schist formed from mudstone and sandstone by heat and tectonic forces during the Jurassic period. Off the eastern flanks of Slaughteryard hill are some significant fossil deposits, aligned to the origin of Bannockburn's coal and shale that had their gestation with the large freshwater complex (called Lake Manuherikia) with its margins being peat rich swaps which created the coal and shale deposits.

The vegetation is a mix of indigenous and introduced woody shrub land in the gullies of Shepherd's and Revell's. The open undulating areas feature a lower stature sward mix of dryland indigenous and introduced species.

The climate is semi arid, created by a rain shadow of the Southern Alps and the high Ranges of the Old Man and Old Woman which results in hot dry summer and very cold harsh winters creating an environment which is tough on plants and humans. With high sunshine hours giving rise to high evapotranspiration the soils are predominately in moisture deficit.

Beyond the Water Race Hill subdivision, Lot 4 has the original town as its western streetscape providing clear connection to its past as a small rural community. The new subdivision is an extension of Terrace St, a small feeder road into Bannockburn.

Description of changes to/patterns of land use which may have affected cultural occupation.

Adopted from Bannockburn Heritage Landscape Study Stephenson et al.

Tangata whenua for the area include people associated with Te Runanga o Otakou, Kati Huirapa Runaka ki te Puketeraki, and Te Runaka o Moeraki. Of Kai Tahu, Kati Mamoe, Waitaha, and Rabuva'i descent, the iwi still retain strong connections to the land, and this is borne out by names and stories of the area. Physical traces (archaeological sites) in the study area and in the vicinity also tell of occupation of the area by Maori as far back as the moa-hunter period.

Central Otago not only provided access to the pounamu sources further west, but was also a seasonal source of resources such as moa, water fowl, and eels. Silcrete and porcellanite were quarried from Central Otago outcrops for making tools. One of the best-known moa hunter sites is in the Hawksburn Valley just east of the study area.

The Bannockburn area was settled by Europeans from the establishment of Kawarau Station in 1858. An interesting characteristic of the area is that families tend to 'stick around'—there are some families who have been established in the area for many generations and whose descendants still live in the community, and others with family links who have returned. The past twenty years have seen an influx of new people into the area, particularly since the early 1990s. The community therefore reflects a range of 'knowing' of the landscape and its history, from those who draw from long family or personal engagement, to those who have a particular interest in the area's heritage and Bannockburn have made a point of researching and collecting information, and to those who have spent a shorter time in the area (but are frequently no less passionate about it).

As well as being a place where people live, work, and commute from, Bannockburn is increasingly becoming a place where people visit. The presence of heritage features and increasingly its distinctive biodiversity, and in particular the DOC reserves, draws tourists. People also come to explore the settlement, enjoy the Bannockburn Inlet, camp at one of the two camping grounds (the Domain and the Cairnmuir camping grounds), and visit the growing number of wineries. Organised events such as the Bannockburn Gutbuster and the Carricktown Crusher (mountain-bike races) have also drawn many people to the area in recent years. Also, the establishment Mōkihi Reforestation Trust and their success in the vision to restore pockets of indigenous vegetation in and around Cromwell in particular the Stuart Ferry site has raised the awareness and significance of areas distinctive historic biodiversity to the local community. Within Lot 40 associated with Shepherds Creek and Revells Gully there are remnants of local dryland shrubland biodiversity that augment the lots other values.

Mention whether the nature of the vegetation or topography may have affected the survey and explain why. Also explain what impact this may have on the assessment.

Seasonal spring rainfall and subsequent vegetation growth and cover had significant effects on the visibility and legibility of remnant archaeological features especially with water race components and small sequences of sluice channels and small tailing sequences of the study area.

As this project has covered several year's seasonal vegetation variation has been contrasting with the earlier site visits in 2016 and 2017 having significantly less vegetation cover with a correspondingly much higher remnant archaeological survey discovery and interpretative value. In more recent visits, the archaeological feature legibility has been compromised by higher and denser vegetation cover.

Within the area that will become Lot 40, the combination of natural steep gully face topography and man-made steep sheer sluice faces compounded by high thick brier and dryland shrubland cover restricted and complicated survey completeness, There are likely undetected and therefore unrecorded archaeological features within Lot 40. The survey is confined to above ground archaeological features and sites with no below surface investigative test pitting.

While outside of the Water Race Hill subdivision the recorded Chinese occupation site and the schist retained bench with the Revell's Sluice basin hold clear evidence and potential for investigative archaeological excavation and research.

Historical Background

Locality Background (*adopted from Rough & Mine Concept Design Bannockburn Development phase 2 Draft 2020*)

Bannockburn has a rich history of occupation and the associated utilisation of the land's resources. The earliest evidence of Maori occupation in the area dates back to the moa-hunter period. The nearby Hawksburn Valley is one of the best-known moa hunter sites. "Tangata whenua for the area include people associated with Te Runanga o Otakou, Kati Huirapa Runaka ki te Puketeraki, and Te Runaka o Moeraki. Of Kai Tahu, Kati Mamoe, Waitaha, and Rabuva'i descent, the iwi still retains strong connections to the land, and this is borne out by names and stories of the area." (Stephenson, 2004)

One story is the ancient tale of the Bouakai (extinct NZ eagle), where an injured girl named Maia was defended from a Bouakai by her mother and brother. Local creeks in the area were named after this story and the Bannockburn area is known as 'Kofiua', the name of the mother.

Europeans began settling the area from 1858 onwards with the establishment of Kawarau Station. The Otago gold rush began in 1862 and saw a mass of gold-seekers venture into the hills in hope of riches. In Bannockburn alluvial areas were mined first (the river flats of Bannockburn and Shepherd's Creeks), and quartz and coal were eventually also mined.

Mining activities have left a huge mark on the landscape with countless features still present, including sludge channels, sluice faces, water races, evidence of previous dwellings and others. There are over 100 recorded archaeological sites in Bannockburn, 7 within the site boundaries. However numerous other archaeological features have been identified through the site surveys that have not been formally registered.

As mining reduced farm steading, orchards became common and for many years from the 1950's onwards, orchards with small and pastoral farming formed the 'backbone' of local life. Many historic orchards have been replaced with vineyards.

Water Race Hill & Slaughteryard Hill

Water Race Hill and the adjoining Slaughteryard Hill contain a significant and diverse array of recorded and un-recorded archaeological sites and features associated with early 1860's goldmining through to the 1930's. Overlapping the gold mining especially with the advent of dredging of the Kawarau and Bannockburn are the remnants of coalmining operations, one of the untold stories of Bannockburn. Along the eastern side of the Water Race Hill land adjoining Bannockburn Road, archaeological records show early lots supported a bakery, historic store, hotel orchard, and stables along with a small reserve area.

The remaining features of early goldmining are several water races, reservoirs, various sluicing's off the true left terraces of Shepherd's Creek, up either side of Revell's Gorge and its large, sluiced basin opening out up to what was and still is the main street of Bannockburn. Revell's Gorge was named after P Revell & Co miners who worked Doctors Flat below Domain Road and the Revell's Gully around the 1880's (The Bannockburn History Project, 2021). The various claims were mined by both European and Chinese miners.

There were half a dozen coal mining operations off the eastern lower slopes of Slaughteryard Hill, the mouth of Revell's Gully and up Shepherd's and Bannockburn Creeks. These involved extensive tunnelling with some ventilation shafts under Slaughteryard Hill from what is now Bannockburn Inlet ((John, 1976)).

Along the eastern side of the Bannockburn Nevis Road there were stables that are alleged to have been built in 1887 by James Lawrence when he shifted his bakery from Quartzville to Bannockburn (A*ppendix 1 Figure 39* (The Bannockburn History Project, 2021) Sheet 5 showing stable Location #110; SO3935 1908 Nevis St buildings; Image- Bannockburn view of historic store, hotel orchard, stables west end of workings (RW Murray Slide Collection 04)).

The Wagon and Chaff Shed further north is alleged to have been owned by James Lawrence between 1887 – 1906 (Location #520 The Bannockburn History Project; *Appendix 1 Figure 34* Image Bannockburn view of historic store, hotel orchard, stables west end of workings (RW Murray Slide Collection 04)).

Across from the Bannockburn Hotel (on the southern slopes of Slaughter Yard Hill) was the hotel orchard planted by John Richards (the proprietor of the Hotel in 1876), consisting of about 30 apple trees (variety unknown). A photographic record of this orchard is shown in *Appendix 1 figure 34* in which was taken about 1899. Image Bannockburn view of historic store, hotel orchard, stables west end of workings (RW Murray Slide Collection 04) *Appendix 1 Figure 39 Sheet 5 of 13* (Location #390) Orchard, The Bannockburn History Project.

A cemetery was once proposed on Slaughteryard Hill's northeastern face. It was shown on plan 'Town of Bannockburn' dated 28 May 1878 by A.R. MacKay, District Surveyor *Appendix 1 Figure 38 Sheet 6 of 13* (Location #402 BHP). The proposed cemetery was never used.

Off the west of the high point of Slaughteryard Hill are the remains of an early reservoir 3400sqm F41/399 that originally featured earth and schist battered walls. The reservoir was supplied by a water race with likely a strung canvas fluming or pipeline to traverse across Revell's Gorge from Patterson & Co Dam(destroyed) F41/366 supplied by the Carrick Race service the Upper Surface Hill Water race F41/369. The realignment of the Bannockburn Road approach as a part of the Clutha Power Project saw a portion of the NW faces of Slaughteryard Hill carved away destroying the parts of water race F41/393 and destroying the NW end of the reservoir. Spoil from this road works was dumped and remain in the middle of Revell's Basin Sluicing's.

The means of water conveyancing across Revell's gorge remains unclear however given the early period of these water races and aligned workings it is likely to be via a flumed canvas pipe strung by wire. Examples of this method are recorded for the Lauderburn water race fluming across Manuherekia River constructed in Nov 1866 and a sketch based on the descriptions of the Imperial Company flume to convey race water from Butchers Creek across the Clutha River to Butchers Point in 1865 is shown in John McCraws book Mountain water & River Gold 2000. (*Refer Appendix 1 fig 35 & 36*). As this was one of the earlier mining endeavours subsequent mining in Revell's Gorge has seen the water conveyancing material repurposed and structural evidence mined away. The intact water races either side of the gorge F41/369 & F41/398 are the only remaining evidence. The Slaughteryard Hill reservoir F41/399 serviced extensive sluicing off the eastern faces of Slaughteryard Hill F41/301 and back up into Revell's Basin.

Off the eastern face of Slaughteryard Hill is a terraced plot F41/394 with Chinese artefact scatters and surrounded by the eroded remains of earth ditch and bank fencing with garden areas. A schist stacked base remains with several likely building platforms. The site was serviced by a water race supplied from the Slaughteryard Hill reservoir with only faint evidence remaining. Evidence and records point to the occupants in the 1860's – 1880's being Chinese gold miners and then later European coal miners in the 1890's and early 1900's ref BHP Dwelling #182.This is a rich and significant site and while evidence of fossicking is clear there is substantial below and above ground archaeological material remaining.

Below this site are twin water races extensions of F41/812 leading into lineal reservoirs, basically deepened and slightly widened water races to store water for the days sluicing's below. The sluicing's and later coal pits have been destroyed and extensively modified by gravel, silica quarrying, construction of the now redundant Bannockburn Waste Treatment ponds.

Within Revell's Gorge, below the bluffs where the gully narrows, there was a schist revetted dam built by Joseph Berry c1875 – c1901 (BHP) for gold mining and later coalmining. Above the bluffs where the gully narrows terraced hand stacked walls of blasted rock remain on the true right bank, being the blasted rock from deepening the gully channel. This was to allow continued gold sluicing and sludge discharge from the extensive sluicing above in the basin head of Revell's Gully. Within Revell's Basin there remains evidence of sluice channels, some cut into bed rock and lined respectively with hand stacked tailings. There are also records of coal prospecting shafts.

Entering into Revell's Basin from the south are the northern remnant remains of Pennyweight Sluicing's (F41/368), which have been truncated by the earlier Terrance Road subdivision in the 2000's and modified by installation CODC storm water and waste treatment infrastructure down the centre of the sluicing's of what

would likely have been old sluice box channelling. The archaeologically recorded remains of the Patterson & Co dam – now destroyed (F41/366) and water race that supplied Pennyweight Sluicing's and Revell's Basin sluicing's (F41/369 &F41/398) along with an unrecorded Terrace St Dam (Location #175 BHP) and schist hut dwelling (Location #412 BHP) were destroyed at the same time.

Below Slaughteryard Hill, the Carrick Range Antimony Company established an Antimony Smelter (Location #352BHP) featuring a brick on stacked schist stone chimney (Location #353 BHP) with only the draft flume now remaining (F41/794) and the site of a clamp kiln. Opened 11 July 1882 with only nine tonnes of ore processed, the Antimony Smelter went into liquidation by March 1883 and allegedly the chimney bricks have been reused as part of Old Cromwell Town rebuilding.

The sluiced and mined faces have exposed Paleoecology (ecology of fossil plants animals and insects) via a stratigraphic sequence of vegetation that is recognised from macrofossil assemblages in Lower- Mid Miocene fluvial-lacustrine sediments of the Manuherikia Group, New Zealand. This is documented in Early Miocene flora of the Manuherikia Group, New Zealand. 10. Paleoecology and stratigraphy, Mike Pole 1993 Journal of the Royal Society of New Zealand, 23:4, 393-426.

Water Race Hill and Revell's Basin features post gold mining old totara hardwood fence post and wire lined paddocks, poplar shelter belts and benched platforms indicating farmstead use and possibly a town commonage. Reference survey plan SO_3081 June 1915 showing Sect 40 (Water Race Hill) surveyed for Ellen Taylor married to Jack Taylor miner, carter & mail Contractor 1878 – 1937 source BHP. Now the old sluicing's and gully provides community space and various foot and bike routes within and for access down to Bannockburn Inlet and recreation area.

Previous Archaeological Work

Description of previous archaeological work within affected area, including nature, extent, results and dates of work undertaken

The area was surveyed in Feb 1982 by Neville Ritchie archaeologist for the Clutha Valley Hydro Development project. Eight archaeological sites across Lot 4 Deposited Plan 339137 and Pt Sec 103 were recorded on New Zealand Archaeological Site recording database. These were referenced for the 2016 – 2017 archaeological surveys associated with the Trust's Bannockburn parcels.

The site records are referenced in this assessment and will be updated. They have provided some information to assess loss and degradation. This is detailed elsewhere in the assessment.

Brief discussion of other authorities granted in the project area, and the results of these authorities.

No HNZ authorities have been granted in the vicinity of the subdivision area.

State how many archaeological sites have been recorded in the NZAA Site Recording Scheme within a specified distance from the affected area.

Refer Table 2 of recorded archaeological sites associated with Lot 4 & Part Sec 103 which details the heritage associated and connected with Lot 4 Water Race Hill & Part Sect 103 land including 16 NZ archaeological Association recorded sites. Asterisked sites, five are directly related to Water Race Hill RC2 01 REV C 2023 subdivision and are all pre 1900 sites as defined by the HNZ. These are sites associated with human activity that occurred before 1900 and provides or may provide, through investigation by archaeological methods, evidence relating to the history of New Zealand.

For a map of archaeological site records on and associated with Lot 4 & Part Sec 103 refer to

Figure 9 Map of NZAA wider view recorded sites on and around Terrace St – Lot 4 DP339137 Water Race Hill & Pt Section 103 Slaughteryard Hill – March 2020

Brief description of the sites of direct relevance to the assessment. Make reference to the Site Record Forms which will be included in Appendix 1.

F41/369* S133/809 Upper Water Race Hill Race - to Revell's Gully & Slaughteryard Hill and Lower Water Race Hill branch supplied from Patterson & Co Reservoir serviced Pennyweights Sluicing's Gully via branches of the main race and went on to cross Revell's Gorge to supply Slaughteryard Reservoir of the NW of Slaughteryard Hill. Physical and desktop research indicates that from the upper water race off Water Race Hill, water was conveyed across Revell's Gorge via flumed canvas piping. Refer *Appendix 1 Figure 40 F41-369 S133-809 Upper Water race to Pennyweights, Revell's Sluicing's, & Slaughteryard Hill reservoir*.

F41/372* S133/812 Shepherd's Ck TL above Gorge Lot 4 bdy Water race. Refer Appendix 1 Figure 43 F41-372 S133-812 water race True Left above Shepherd's Ck running along bottom boundary of Lot 4 Water Race Hill with historic post & wire fence and remnant poplar trees. Off the water race are various small, sluiced gulches down into Shepherd's Creek Gorge. There is evidence of a small reservoir supplied by the water race. The water remnants previously went around and up into Revell's Gorge possibly suppling a dam recorded in (Crump, 2021) Location 356 Revell's Gorge Dam built by Joe Berry used for sluicing in lower Revell's Gorge. Refer photo of Harry Burrow's and Peter the Goat below the Revells Gorge dam recorded as the 'The Last Bannockburn Sluicer' *Appendix 1 Figure 31 Harry Burrows & Peter the goat.*

F41/385* S133/825 Revell's Basin Sluicing's & water races, featuring Ground Sluicing's/ sluicing face/water races. Refer *Appendix 1 Figure 47 F41-385 S133-825 Revell's Basin workings & races – track.* Earlier subdivision

and earth work along the south side has seen the original sluice faces of the terrace extensively modified. CODC waste services and storm water services have cut right cross the basin and have destroyed a section of the central schist lined boxed sluice/sludge channel discharging out into the Revell's Gorge.

A large spoil dump is present in Revell's Basin which has buried some of the Revell's sludge channel network, allegedly from the cutting down of the western face of Slaughteryard Hill to create new access into Bannockburn and new bridge approach to cross the raised Kawarau Arm as a result of the Lake Dunstan impoundment from Clyde Dam.

Within the sluiced Revell's Basin the remains of various branched and central schist lined sluice channels remain with adjacent workings, tailings and period artefact scatters of glass bottle ware. In the basin below Pennyweights Sluicing area is a benched area with revetted schist edging within a poplar, post and wire fencing remnant surround. This may have been an occupation site but as a result of council services installation it is now dissected and disturbed with interpretation compromised. The area is used for access via an informal ground trail off Terrace Street down and out to the Bannockburn Inlet and recreation area.

F41/368* S133/808 Pennyweights Sluice Gully Sluicings/sluicing face. Refer Appendix 1 *Figure 42 F41-368 S133-808 Pennyweights Gully Sluicing's supply by F41-369 S133-809 upper water race – Water Race Hill*
This sequence of ground sluicing's has been truncated by half as a result of an earlier Terrace Road subdivision, with only the lower half remaining. What remains has good legibility and evidence of numerous sluice face water races remaining around above the sluice faces perimeters. Iron ware artefacts remain. Unfortunately, the routing and installing of waste and storm water has destroyed the internal network of schist lined sluice boxes use to collect alluvial gold within the riffles of the channels within the sluicing's.

Research Results

The archaeological features identified during the several site surveys discussed above are recorded in the site plans included in the Appendix 1 - Plans of Kopuwai Archaeological Surveys.

See in particular *Appendix 1 Figure 2* which provides Spatial referenced plan of Water Race Hill subdivision RC2 01 REV C 2023 over 1974 Retrolens aerial SN with NZAA recorded site and surveyed archaeological features mapped that the subdivision has been designed within.

Description of new and existing sites located during the site survey, including extent, condition and any evidence of damage either recent or historic.

Both Water Race Hill and Slaughteryard Hill land have been archaeologically surveyed in 2017 with existing sites to be updated and new sites to be recorded. Water Race Hill archaeological sites and features have been assessed for effects from the proposed subdivision on remaining archaeological features in consultation with Doug Jones (Trustee), Walt Denley (Landpro). A spatial plan was prepared showing archaeological features; followed by a subdivision design as informed by recorded archaeological sites and features.
Table 2 above records the archaeological sites associated within Lot 4 & Part Sec 103 and the *denotes sites specific to Water Race Hill Subdivision. Extracted below in Table 4 are the recorded sites found on Water Race Hill.

Table 4 of recorded archaeological sites specific to Water Race Hill extracted from Table 2

F41/369*	S133/809	Upper & Lower Twin Water Races- Water Race Hill Race – with a branch race to Pennyweights sluicing's, the upper branch race Revell's Gully & Slaughteryard Hill and branch to Lower Water Race Hill to Revell's Gorge sluicing's	Water race	Industrial	Water race
F41/372*	S133/812	Shepherd's Ck TL above Gorge Lot 4	Water race	Industrial	Water race
F41/385*	S133/825	Revell's Basin Sluicing's & water races	Ground sluicing/water races	Mining - gold	Sluicing's/ sluicing face/water races
F41/368*	S133/808	Pennyweights Sluice Gully	Sluice gully	Mining - gold	Sluicing's/ sluicing face

New site records are pending for:

- New site records for (Water Race Hill) farmstead/commonage fencing ex Section 40 SO_3081 June 1915 _Sect 40 (Water Race Hill) surveyed for Ellen Taylor married to Jack Taylor miner, carter & mail Contractor 1878 – 1937 source BHP.
- New site records for various colliery sites off Revell's Gully and Slaughteryard Hill & Shepherd's Creek (*potentially under Water Race Hill – no above ground surface of evidence of ventilation shafts observed*)as recorded on Bannockburn History project *Appendix 1 Figure 38* Map Sheet 6 of 13 #s 185, 189, 502, 186, 187– Paul Crump & various early mining plans SO3929 Coal Lease Sect 80 John Hodson 1910, SO3939 Coal Lease Sect 85 E J McCabe & G Crabbe 1912, SO3940 Coal Lease Sect 86 & 38 J Gordon H Russel R Robertson Ellen M Gibson 1912, SO3941 Coal Lease Sect 87 Ellen Mary Gibson 1912. Refer *Appendix 1 figure 29*.
- New site record for Slaughteryard Hill lower twin races likely extensions off F41/812 to include lineal reservoirs servicing sluice workings and later collieries down into Bannockburn Inlet ex Revell's Gully Shepherd's Creek Bannockburn Creek.
- Site record update for F41/369 Upper of the Twin Water Races to include the linked lower water race (proposed for adaptive reuse an active path) on Water Race Hill as a branch of the upper water from Patterson & Co reservoir F41/366.

Table 5 of new unrecorded sites associated with Lot 4 & Part Sec 103 and * sites are specific to Water Race Hill Subdivision

New Unrecorded Sites				
Location	Name	ShortDescr	Site Type	Site Feature
Water race Hill*	Historic fence	Hard wood post & wire	agriculture	Fence posts & wire
Various	Collieries	Coal mine – tunnels & processing	Mining	Tunnel, Shafts, Processing site remains
Slaughteryard Hill	Twin water races & lineal reservoir	Water races & lineal reservoir	Mining	Water races – enlarged water races

The collieries/coalmining sites are largely post 1900 and are managed under the RMA Act heritage provisions administered by CODC.

Being recorded on the Arch Site will provide an alert to CODC planning and any activity potentially affecting these sites and should trigger an assessment of effects to address cultural and historic heritage matters.

The Lot 4 Water Race Hill RC2 01 REV C 2023 subdivision proposal while adjacent to Revell's Gully and Shepherd's Creek coal lease sites and potentially above some of the coal mine dives has no direct physical effect or connection to them apart from the upper Water Race Hill race F41/398 which by flume/pipeline serviced McLellan& Burrow Sluicing's and subsequent coal pits off the eastern faces of Slaughteryard Hill across Revells gully F41/403 and Shepherd's Creek water race along the bottom boundary F41/372 that is likely to have serviced the various Collieries in and around Revell's Gully and Shepherd's Creek. There are records of ventilation shafts off Slaughteryard Hill. In relation to Water Race Hill no above ground surface of evidence of ventilation shafts was observed.

Description of land modification

Land modification of the Water Race Hill site has been limited to some water race reuse for wild flood irrigation when it was occasionally grazed by Doug Jones's sheep. The more recent Terrace Road subdivision saw the

disconnection to water and destruction of the Patterson & Co Reservoir F41/366 and partial destruction of the Upper Water Race Hill race F41/369 connecting back to Patterson & Co Reservoir.

A section of Pennyweights Sluicing's F41/368 was destroyed with a previous Terrace Rd subdivision which also resulted with CODC storm water and waste service being installed down the centre of the remaining section of Pennyweights Sluicing's. The installation of these stormwater and wastewater systems is very likely to have destroyed the boxed sluice channel for capturing by riffles the alluvial gold being sluiced out of the terrace sluice faces with water via Upper Water Race Hill race F41/369 supplied from Patterson & Co Reservoir F41/366.

All recorded sites were relocated.

State that the new sites found during the site survey have been entered into the NZAA Site Recording Scheme and give their site numbers.

New sites as recorded above, and site updates are pending.

Discuss any issues that the site survey and research may have raised; how comprehensive was the survey, how high is the likelihood of further unrecorded sites, explanation for the absence of sites, plus any further limitations of the data presented.

Within the area that will become Lot 40, the combination of natural steep gully face topography and man-made steep sheer sluice faces restricted and complicated survey completeness, compounded by high thick briar and woody weed cover. There are likely undetected and therefore unrecorded archaeological features within Lot 40.

The survey is confined to above ground archaeological features and sites with no below surface investigative test pitting.

While the visual survey is above ground, some partially exposed surface artefacts have been observed in Revell's Basin and in Pennyweights Sluicing's. Early archaeological survey informing the subdivision design and adopting avoidance of archaeological sites and features for as much as possible has reduced the probability of intercepting below surface archaeological scatters and features associated with the subdivision that could be disturbed and intercepted by accidental discovery during subdivision works on the site. Given the complex and sustained use associated with goldmining sequences; occupation; farm steading and Bannockburn commonage land use are pre-1900's, subdivision ground disturbing works should be monitored by an archaeologist and recorded according to best practice. All recovered material should be appropriately recorded and analysed. A full report on any archaeological material found should be prepared and submitted to the Heritage New Zealand within one year of commencement].

While outside of the Water Race Hill subdivision, the recorded Chinese occupation site F41/394 and the schist retained bench with the Revell's Sluice basin hold clear evidence and potential for investigative archaeological excavation and research.

Discussion on the context of the project area; how does it fit in within the wider geographical, historical, archaeological and research themes of the region, what is the potential to contribute further information to these fields.

As the archaeological assessment informed by the earlier Clutha Power project archaeological site records with updated archaeological survey have revealed; the Water Race Hill subdivision site contains a surprisingly intact sequence of remnant water races servicing an associated array of alluvial mining sluicing's largely surrounding the subdivision. The site also features the remains of early farm steading paddock hardwood post and wire fencing with connections to early Bannockburn Commonage grazing.

The associated Part Sec 103 and the remainder of Lot 4 DP 339137 holdings of the Trust's are integrally connected to the Water Race Hill features with extensions of the water race network and alluvial mining along with other archaeological features of significance and potential research. These being the F41/399 Slaughteryard Reservoir remains and F41/394 the Chinese occupation site and within Revell's Basin along the Bannockburn Road frontage are the past historic sites of Bannockburn's main street store and saddlery and dwelling sites and the past recreation reserve documented features of early Bannockburn town history.

Collectively as a heritage landscape with early town remnants and commonage; alluvial goldmining with sequenced evidence from very early water storage and water race conveyancing servicing respective gold workings involving ground and terrace sluicing's with aligned mining occupation sites evidence, (Chinese and European) overlaid with farm steading. Followed with Bannockburn's untold stories of a rather intensive sequence of coal mining adjacent and very probably underneath the Jones Searell Family Trust land parcels.

The proximity and relative intactness of this tapestry of overlapping historic land use contributes significantly to the existing history of Bannockburn that is a defining and distinguishing point of difference that the Bannockburn community recognises and values as it is by the wider region and visitors.

Front footing the archaeological survey and landscape study to inform the subdivision survey and design has been instrumental in securing the best fit for this new cultural layer of residential development with its sensitive and considered integration into the remaining heritage and landscape values. A best practice multi disciplinary collaborative approach with the results to show for it.

Constraints and Limitations

Describe not only the nature of the limitations but also how they may impact on the effectiveness of the assessment.

Seasonal spring rainfall and subsequent vegetation growth and cover had significant effects on the visibility and legibility of remnant archaeological features especially with water race components and small sequences of sluice channels and small tailing sequences of the study area.

As this project has covered several year's seasonal vegetation variation has been contrasting with the earlier site visits in 2016 and 2017 having significantly less vegetation cover with a correspondingly much higher remnant archaeological survey discovery and interpretative value.

In more recent visits, higher and denser vegetation have compromised archaeological feature legibility.

Within the area that will become Lot 40, the combination of natural steep gully face topography and man-made steep sheer sluice faces compounded by high thick brier and woody weed cover restricted and complicated survey completeness. There are likely undetected and therefore unrecorded archaeological features within Lot 40.

The survey confined to above ground archaeological features and sites with no below surface investigative test pitting.

Outside the Water Race Hill subdivision, the recorded Chinese occupation site and the schist retained bench within the Revell's Sluice basin hold clear evidence and potential for investigative archaeological excavation and research.

Constraints/limitations relating to methodology could include the implications of not having undertaken/completed a site survey, or any pertinent limitations with the sources/techniques utilised (including test-pitting).

While as noted above there were physical constraints with the completeness of the archaeological survey concerning the steep gullies, the actual footprint for the subdivision residential lots and the roading and driveways is complete. Any physical track earth works associated with Lot 40 (noting that none are proposed) would require further archaeological survey to confirm the absence of archaeological fabric that could be modified and or destroyed accidently.

The desktop work has not involved sequential detailed title and historic land ownership. Current research is pepper potted to specific parcels and references.

Constraints/limitations relating lack of information provided to the archaeologist by the client (e.g. developments plan not finalised therefore survey undertaken based on draft plans only; mining areas known but not the location of associated works such as road construction)

The the Trust's and associated project parties have provided the appropriate material to both survey and compile an appropriate assessment. Outstanding is the management of subdivision spoil/waste from roading, and the respective services. Aligned is the need for a management plan to support the archaeological authority in terms of marking remaining archaeological features to avoid subdivision construction damage.

Constraints/limitations relating to previous archaeological work undertaken could examine any limitations of past surveys or excavations.

Earlier survey and site recording appeared incomplete in terms of the two water races traversing Water Race Hill and had not resolved the water supply to Slaughteryard Hill reservoir. There also appears sparse records for the colleries and coal measure sites but perhaps this can be explained by them mainly being a post 1900's activity.

Disclaimer on Maori cultural values (i.e. an acknowledgement of Maori cultural values if present, but not an assessment of these values as this is the responsibility of the appropriate iwi group to provide). Include whether the iwi was involved in the survey or assessment if appropriate.

While Tangata Whenua traversed and occupied sites in the Bannockburn and Hawksburn, no recorded sites are present on the two land parcels (the absence of recorded sites doesn't mean that Tangata Whenua archaeological evidence is absent) and historic research associated with this project has not come across any specific Tangata Whenua references, apart from those referenced in the Bannockburn Heritage Landscape Study. The project area is near the Kawarau Statutory Acknowledgement area recognised as an early trail route. Below are relevant references from the Ngāi Tahu Atlas web site.

> "The Kawarau River was a traditional travel route that provided direct access between Whakatipu Waimāori (Lake Wakatipu) and Mata-au (the Clutha River). A natural rock bridge known as Pōtiki-whata-rumaki-nao once existed on the Kawarau, allowing people to cross the river. During the 1879 Smith Nairn Royal Commission of Inquiry into the Ngāi Tahu land claims, Ngāi Tahu kaumātua recorded Kawarau as a kāinga mahinga kai (food-gathering place) where weka, kākāpō, kea, and tuna (eel) were gathered." (The Ngāi Tahu Cultural Mapping Project, 2021)
>
> "In 1856 I was often brought in contact with the Māoris, who lived in a village on the banks of the Waitaki River. One among them was a fair English scholar. He told me that a mighty lake called Whakatipu existed near the Greenstone River, the Māoris using the ravine of that stream as part of their ancient track to the West Coast. To establish the locality of the Whakatipu lake, he further stated that its overflow was called Kawarau River. Where a natural rocky bridge existed, as at present, near Te Wai-o-Korokio (Roaring Meg) where, after floating their 'mokis' down from the lake, they drew them inshore, and carried them past this natural bridge, then relaunched them. The way he pronounced the word Whakatipu was 'Fakatipu,' thus making the letters 'wh' sound as our 'f.'" (The Ngāi Tahu Cultural Mapping Project, 2021)
>
> "Te Pōhutu is the Māori name for the Carrick Range in Central Otago. During the 1879 Smith-Nairn Royal Commission of Inquiry into the Ngāi Tahu land claims, Ngāi Tahu kaumātua recorded Te Pōhutu as a kāinga mahinga kai (food-gathering place) where weka were gathered." (The Ngāi Tahu Cultural Mapping Project, 2021)

Disclaimer on Maori cultural values.

While no specific evidence Maori cultural values presence has been recorded or noted, the site is extensive and well modified. There may have been values present in the past, but this is not an assessment of those values as this is the responsibility of the appropriate iwi group to provide.

To the report writer's knowledge, no current consultation with Ngā Tahu has taken place. A copy of this assessment will be provided to Aukaha for their assessment.

Archaeological Assessment

Survey & Assessment progression

Plans, spatial data and spreadsheet tables were prepared identifying the subdivision parcels requiring protection measures for archaeological features within the respective parcels along with parcels with archaeological features requiring an archaeological authority to modify and or destroy. These were supported by the 8 April 2019 memo detailing the requirements and treatments to preserve significant archaeological sites and features to be incorporated into the subdivision which was attached to the 8 April 2019 CODC Application for Subdivision Consent.

During the site visit Rev E was under review (*Note the Lot numbers reference are now revised to reconcile with RC2 01 REV C 2023 subdivision plan*), we walked by way of a circuit outwardly from Lot 20 (RC2 01 REV C 2023) following the lower water race a branch of the upper water race (F41/369) of Water Race Hill which services gulch sluicing's on the true right of Revell's Gully below Lot 30 in Lot 40. The lower water race then merges parallel below the upper water race (F41/369) in Lot 30 above Lot 40 (RC2 01 REV C 2023). The upper water race servicing via either an impressive wooden aqueduct or pipe syphon or most probable a high canvas piped flume across Revell's Gorge to the Slaughteryard Hill reservoir (F41/399) via water race (F41/398). The reservoir serviced the sluicing's (F41/403) below in the adjoining eastern neighbour's (Lot 2 Deposited Plan 304454). Running along above Shepherd's Creek on the true left (below Lots 20 – 15 and within Lot 40 (RC2 01 REV C 2023) is a water race (F41/372) that serviced gold mining sluicing's and later coal mining off into Shepherd's Creek and out to the junction with Revell's Gully and Bannockburn Inlet. These water races were supplied from the Carrick Race from a reservoir F41/366 known as Patterson & Co Dam (destroyed) as marked on Ridlands 1890 map and SO14103 Plan of Town of Bannockburn June 1910 Refer *Appendix 1 Figures 37 & 26.*

After viewing Revell's Gorge beyond the old hardwood totara post fence line of what was previously the boundary Section 40 (Appendix 1 Refer figure 28 SO3081 1915 Sect 40 surveyed for Ellen Taylor) we followed the fence line down and across to the truncated remnants of Pennyweights Gully (at Lots 9 - 7 RC2 01 REV C 2023) and then back to Terrace Road noting the remnants of shallow water race branches off the upper water race (F41/369) with turnouts to sluice Pennyweights workings.

A report was produced and circulated for discussion 18 03 2020 and has now been incorporated into an earlier archaeological assessment version and into this 2023 archaeological assessment.

A revised second resource consent application has been prepared by Town Planning Group (NZ) Limited by Craig Barr. Application for Resource Consent to the Central Otago District Council: D. J. Jones and N. R. Searell Family Trusts, *Subdivision and land use resource consent, 88 Terrace Street, Bannockburn* 27 June 2023. This has been reviewed and where relevant adopted revisions to subdivision redesign to inform this revised HIA.

Further work has resulted in additional dialogue and discussion with Landpro confirming design methodology for roading, driveway treatments, reinstatement of a section of the upper water within Lot 30 previously scheduled for destruction and adaptive reuse treatments for the lower of the twin water races for this RC2 01 REV C 2023.

Refer Appendix 1 Figures 17, Landpro draft RC2 01 REV C 2023 preliminary engineering layout for proposed subdivision of Lot 4 DP339137 Terrace St Bannockburn 29.08.2023.

These have been accepted by the archaeologist pending a management plan for on the ground subdivision construction management to avoid accidental damage to archaeological sites and features designed for integration into the subdivision.

The Landscape Assessment Report for proposed subdivision Water Race Hill RC2 01 REV C by Rough Milne Mitchell Landscape Architects Limited (Architects, 2023) has been reviewed in relation to affects on the HIA. The use of landscape design control mitigation plantings is a new element to the revised resource consent. The key revision to reinstate the upper of the two main races within the footprint of the Lot 30 is now subject to design control visual screening either side the water race invert to provide visual screening of built form on lots

5, 10-14 from viewpoints east of the site. This physically retains the upper twin water race but will be visually obscure and functionally disconnect it, in terms of legibility and connectivity to the wider heritage values. Mitigation planting will consist of 40% *Kunzea serotina*, 40% *Leptospermum scoparium*, and 20% *Coprosma propinqua* planted at 3m centres with a temporary irrigation system installed and operated for the first three years from the date of planting. To manage effects from the visual screen planting on the upper water race where proposed, plantings will avoid the water race invert with a setback. Refer *Appendix 1 Figure 15 RMM Proposed subdivision Landscape Plan.*

Almost all of the lower water race is to be adaptively repurposed (as already proposed) into a schist metalled narrow foot path within the remnant water race structure, with appropriate residential drive crossing treatments which allow combined residential driveway use and allow active access and egress along the pedestrian footpath on the adapted downslope water race berm.

With RC2 01 REV C 2023 the upper water race southern extent outside of the portions preserved in Lots 30 and 40 are being subjected to two roadways, and potential residential building platform earthworks and likely lot dissection, reducing meaningful legibility and therefore functional interpretation as a water race. This latest revision will see more of the upper race remnants remaining within Lot 30 and 40 leading to the flume pipe abutment for crossing Revell's Gorge and retaining the majority of the lower race by adaptively repurposing it as a metal footpath to meaningfully preserve and maintain it as a key part of the wider heritage landscape and gold mining fabric component.

Associated with the effects on the main water races, within the residential lots there is the loss of the other identified minor shallow cryptic water distributing components supplying a various array of sluicing's protected outside of the residential lots that is acknowledged. The protecting of the respective Pennyweight Sluice faces and others around the wider perimeter that the subdivision was designed around to preserve.

The partial removal of a section of the early farmstead fencing was accepted subject to storing and reusing the old fence posts and material on maintaining the fence lines being retained especially along the Shepherd's Creek Lot 4 boundary. In practice, if any fence posts are not reused immediately and need to be retained, the fence posts could be stockpiled within Lot 40, and could be utilised by a local volunteer group (such as the Otago Goldfields Heritage Trust) if the posts along the Shepherd's Creek Lot 4 boundary need to be replaced.

Archaeological Values

Assessment for Water Race Hill

The criteria for assessing archaeological value is condition, rarity/uniqueness, contextual value, information potential, amenity value and cultural associations)

Site	Value	Assessment
Water Race Hill subdivision within Lot 4 off Terrace Road bounded by Shepherd's Creek on the Southeast and Revell's Gorge to North	Condition	The Water Race Hill subdivision site is surprisingly intact apart from the partial damage to Pennyweights Sluice Gully from CODC services and the earlier Terrace Road subdivision. Depending on spring vegetation growth the remaining features of sluicing's, tailings, sludge channels, water races and farmstead/commonage fencing are all largely visible and legible for interpretation
	Rarity/ Uniqueness	Apart from the old flume site and early hardwood post and wire fence all the other features are locally, regionally and nationally common. A flume system of this scale is uncommon. The rarity and significance are with the heritage landscape of combined and associated sequencing of gold mining, antimony processing, farm steading/ Bannockburn commonage, contribution to early Bannockburn town scape by way of store

Site	Value	Assessment
		and stables, Chinese occupation, garden and later coalmining.
	Contextual Value	Has very high contextual value in its array and association with gold mining, antimony processing; early town settlement, Chinese, farm steading/Bannockburn commonage and coalmining.
	Information Potential	The subdivision with sensitive and considered design is preserving local heritage for appreciation and education of our past for future generations. The Chinese occupation site while out of the Water Race Hill subdivision has high potential for research investigation with such high and varied presence of surface artefacts and structural evidence.
	Amenity Value	The subdivision with sensitive and considered design is preserving local heritage for appreciation and education of our past for future generations
	Cultural Associations	While no specific evidence links the site to Tangata whenua there are various cultural associations via the Kawarau, Hawksburn and the Nevis. There is a high sense of identity for the Bannockburn community with its association and high level of preservation for its past gold mining and pastoral farming. The place is held in high regard for its combined landscape and heritage values making a defining point of difference. While outside of the subdivision site the Chinese occupation site will have Chinese cultural association. The place is held in high public esteem for its collective values with Bannockburn distinctive heritage landscapes a key distinguishing and defining attribute.
	Criteria for inclusion on NZ Heritage List	A, C, E, F, I, K The collective components of this heritage landscape reflect representative aspects of NZ history; Has the potential to provide knowledge of NZ history; the public and community have esteem for the place with potential for public education and has features from early settlement and industry. The place forms and contributes to a wider historic and cultural area.

Describe the assessment of each archaeological value for each site to be affected (i.e. give an explanation for the value descriptions given drawing on evidence discussed previously in this report and placing it within the context of current archaeological knowledge.

As noted, the majority of remaining archaeological values are being preserved by sensitive and considered design of the subdivision as represented by subdivision plan RC2 01 REV C 2023.

Below is a description and explanation on archaeological features identified for modification and portions for destruction.

Assessment for selected water race destruction & adaptive reuse

Site	Value	Assessment

Site	Value	Assessment
Branch water races and upper water race hill races (Retain Lot 30 & 40 portions, destroy modify remaining) & (adaptive reuse) of lower twin water race hill races and the section of Shepherd's Creek water race along the Lot 4 boundary.	Condition	All water races – larger main and small shallow branch distribution race have a good level of intactness and completeness.
	Rarity/ Uniqueness	Water races are a common site type in this area/environment and apart from the linkage to the flume pipe crossing and some sections of schist revetment they have little structural contribution.
	Contextual Value	The water races have contextual value as an element of early water conveyancing especially in the wider heritage system and landscape connectivity.
	Information Potential	There is little potential for information to be recovered by archaeological means. Cross section profiles could be taken but more recent irrigation use may confuse interpretation.
	Amenity Value	Negligible for the smaller shallow distribution water race without interpretive materials and with the residential subdivision interpretation will be needed for the adaptively repurposed main water race and the associated heritage.
	Cultural Associations	Early European & Chinese servicing goldmining and coal mining & Chinese gardening.

Of the two main water races NZAA site F41/369 both are now to be retained for the most part. The key part of the upper twin race (140m in length) leading NE into Revells Gully is in Lot 30 proposed as Recreation Reserve is now to be preserved subject to landscape mitigation screen planting which while physically retaining the upper twin water race will obscure it from functional legibility and connectivity to the wider heritage values, where previously it was subject to destruction in REV I 2021 by way of increased residential lot density and resulting roading , driveways and carparking dissection of the water race left little meaningful structure to be preserved. Refer 8 & *Appendix 1 Figure 7 RC2 01 REV C 2023 over SN 1974 – Water Race Hill – Historic fences – retain (green) – remove & reuse (red).* 9

The Landscape design controls recommended as part of Landscape Assessment Report for proposed subdivision Water Race Hill RC2 01 REV C by Rough Milne Mitchell Landscape Architects Limited (Architects, 2023), affecting heritage involve mitigation planting proposed within Lot 30 to provide visual screening of built form on lots 5, 10-14 from viewpoints east of the site. Mitigation planting will consist of 40% *Kunzea serotina*, 40% *Leptospermum scoparium*, and 20% *Coprosma propinqua* planted at 3m centres with a temporary irrigation system installed and operated for the first three years from the date of planting. To manage effects from the visual screen planting on the upper water race where proposed, plantings will avoid the water race invert. Refer *Appendix 1 Figure 15 RMM proposed subdivision landscape design control planting plan*

The sections of the upper race within Lots 30 & 40 will be retained while the portions within road reserve will be destroyed and less legible portions traversing residential Lots 2, 4, & 6 may be modified subject to building platform location and earthworks. So, the upper water race marked on the plans as blue -→→→ will be retained and portions marked in the plans as →→→ will be proposed for modification and or destruction. The upper race out of the two branches has higher significance due to likely earlier provenance and connection via a flumed pipe to supply the Slaughteryard Reservoir F41/399 and service the NE Slaughteryard Hill gold workings and later coalmining and the Slaughteryard Hill Chinese occupation site with associated garden areas.

The linked lower branch off NZAA site F41/369 will be preserved along the upslope berm and invert, with the downslope bund flattened and surfaced for use as a subdivision pedestrian path with five shared roadway/driveway crossing treatments as specified in Landpro RC2 01 REV C 2023 *Appendix 1 Figure 19 Landpro driveway impacts plan on lower twin water race and Figures 17 & 18 And Appendix 1 Figure 3 RC2 01 REV C 2023 over SN 1974 – Water Race Hill – Water races – preserve - adapt – destroy*.

It has been quite a design challenge given the needs of heritage obligations, subdivision roading, services, and driveways combined with CODC subdivision design requirements and steepness and topography of the subdivision site. The Landpro Surveyor needs to be acknowledged for his commitment and dedication in traversing the combined needs of respective parties in the subdivision. The reinstatement of preservation for latter extent of the upper twin water race in Lot 30 and adaptive reuse design for the lower water race is a good win-win all around with the heritage water race being sensitively retained with a portion being repurposed as a pedestrian path.

A proportion of the small shallow branch distribution water races servicing the Pennyweights Slicing's are being recommended for destruction where they encroached into residential subdivision parcels. They have low legibility and their earth construction with weathering retain little physical presence for meaning preservation among the proposed residential properties.

The integrity of some of the southeast faces of the subdivision into Shepherd's Creek has also been compromised with more recent repurposing for wild flood irrigation.

The water races proposed for disturbance and destruction are marked on the plans in red -→→→

The lower water race (F41/372) along the bottom of the subdivision boundary along the true left of Shepherd's Creek servicing sluicing's along the creek and around to Revell's Gully is proposed for adaptive reuse as an informal bare ground walking trail in the old race formation within Lot 40 the 4.44 ha freehold informal walking, amenity and natural area. It is proposed for an archaeological authority to adaptively reuse the Shepherd's Creek water race as an informal walking trail within Lot 40. No modification would be required to demarcate the trail, other than some pegging/trail marking, and some bramble vegetation clearance. The exact route that the trail will take is yet to be determined, in lieu of an additional site visit to identify a logical and achievable route. This bare ground walking trail will form part of a loop around the Water Race Hill subdivision and will enhance engagement and appreciation of the heritage and landscape values.

Assessment for partial hardwood post and fence line

Site	Value	Assessment
Partial removal of hardwood post and wire fence line	Condition	Fair – most hardwood post remain, various sections of wire down and broken on the Revell's Gully boundary. The Shepherd's Creek boundary is being retained within Lot 40 and reclaimed fencing material from the Revell's Gully boundary will be used to upgrade and maintain the fence lines identified for preservation.
	Rarity/ Uniqueness	These elements especially associated with early town commonage land are very rare due to age, urban sprawl and replacement with modern fencing
	Contextual Value	Has very high contextual value in its association with gold mining, early town settlement, Chinese, farm

Site	Value	Assessment
		steading/Bannockburn commonage and coalmining.
	Information Potential	Incorporating the historic fence line into some of the subdivision boundaries with considered design is preserving local heritage for appreciation and education of our past for future generations.
	Amenity Value	It provides a functional boundary with clear connection to past historic use of the land.
	Cultural Associations	There is a high sense of identity for Bannockburn with its association and high level of preservation for its past gold mining and pastoral farming. The place is held in high regard for its combined landscape and heritage values making a defining point of difference.

The hardwood post and wire fences appear associated with what was previously Sect 40 (Water Race Hill) surveyed for Ellen Taylor in June 1915, married to Jack Taylor local miner, carter & mail contractor, now incorporated in to Lot 4. These hardwood fences in this timber sparse region replaced the earlier fencing method of intensive and time-consuming construction of earth ditch and bank systems of fencing. Hardwood totara was the old local source of timber and the likely reason for its sparse and isolated presence now.

The fence is representative of early fencing and is now rare especially is this setting. With the subdivision design it can be preserved for the majority of the old boundary of sect 40 with reclaimed material from the fence section identified for removal due to incompatibility with the residence parcels and loss of meaningful contribution to the site's heritage landscape. The sections of fence line for removal and reuse of posts with residual capacity are marked ~~XXXX~~ and the fence line for protection and preservation are marked ~~XXXX~~ along the Shepherd's Creek and partway up the Revels Gorge boundary. Refer Figure 7 & *Appendix 1 Figure 7 RC2 01 REV C 2023 over SN 1974 – Water Race Hill – Historic fences – retain – remove & reuse.*

HNZ site visit

Heritage NZ (HNZ) Otago Southland Area Manger Jane McKnight and regional HNZ archaeologist Nikole Wills at their request have had a guided site visit with project archaeologist Matt Sole and trustee Doug Jones on the 20 Jan 2021 to gain an understanding of the refined subdivision proposal and a feel for the remaining heritage and landscape values and setting of the site within Bannockburn and the wider Cromwell basin.

Quoting Nikole Wills, *E-mail Thursday, 4 February 2021 10:16 am; To: Matthew Sole; Subject: Bannockburn subdivision site visit. "Heritage New Zealand Pouhere Taonga was happy to see that many of the archaeological features and the archaeological landscape will be protected through the design of the subdivision. We are pleased to see that many of the tailings and water race sections are to be protected in situ. The approach taken in managing archaeology in this subdivision from the design stage is greatly appreciated and will ultimately result in the preservation of much of an important mining landscape for generations to come."* Note both Nikole Wills & Jane McKnight have resigned from HNZ.

Heritage Impact Assessment

Description of proposed works including size of area affected, nature of and reason for works and depth of excavations.

There are over 100 recorded archaeological sites in Bannockburn, and the applicant has employed local archaeologist Matthew Sole, Kopuwai Consulting Limited to undertake a historic feature inventory of all the historic elements that are present on the site and compile an archaeological assessment of effects of the subdivision proposal to inform both an HNZ archaeological authority application and Resource Consent on conditions for managing the subdivision effects by avoiding, minimising and mitigation where damage or destruction of pre and post 1900 archaeological features and sites is unable to be avoided.

Seven recorded archaeological sites were identified over Lot 4 and Part Sec 103 with five associated with the Water Race Hill subdivision Resource Consent as documented in Table 2 of recorded archaeological sites associated with Lot 4 & Part Sec 103, with * sites specific to Water Race Hill Subdivision. The applicant wishes to retain links to the past, by protecting key archaeological features and landforms and either sympathetically incorporate them into the development as proposed or to avoid disturbance by setting certain Lots away from these identified areas within the Water Race Hill subdivision.

These elements have heavily influenced the design of the subdivision, with many of the historic features being retained and featured by the subdivision design shows the identified historic features concerning the proposed subdivision. The applicant intends to use these historic elements to feature the history of the site and give a distinct character to the proposed subdivision that will enhance and showcase the rich history present with Bannockburn.

Operative CODC District Plan consideration

The Operative CODC District Plan ("District Plan") recognises that the district has a wealth of heritage items and precincts that are an important part of the area's amenity and character. Activities that affect properties within heritage precincts or heritage items are evaluated against the rules outlined in Section 11, heritage precincts, and Section 14, heritage buildings, places, sites, objects and trees.

The District Plan register includes heritage buildings, places, sites, objects and trees that are recognised as being significant to the heritage of the district, and their inclusion on Schedule 19.4 affords them protection while encouraging their continued use, adaptive reuse, and development. The rules relating to these heritage items are outlined in Section 14 of the District Plan. The register includes all Heritage New Zealand Category 1 and Category 2 listed sites, which have been evaluated according to criteria outlined in the Heritage New Zealand Pouhere Taonga Act (2014).

The District Plan makes some efforts to identify historical sites, but the list in the plan is not exhaustive. Listed in CODC Schedule 19 Part A, Heritage Buildings, Place, sites and objects within Bannockburn Township are: -

- #26 Map 7&44 - Bannockburn Sluice Workings Part Section 166 Block I Cromwell SD 5612 II
- #28 Map 7 - Bannockburn Presbyterian Church, Hall Road, Bannockburn Sections 8-10 Block V Town of Bannockburn 2385 II
- #28A Map 7 - Ray Cottage, Domain Road, Bannockburn Section 46, Block I, Bannockburn Survey District 7594 II
- #29 Map 8 - Post Office, Bannockburn Section 79 Block I Cromwell SD
- #30 Map 8 - Store, Bannockburn Part Sections 1 & 2 Block III Town of Bannockburn
- #31 Map 8A - Bridge Tower and Abutments, Bannockburn Legal Road

Lot 4 is identified on CODP Map 8 as being entirely located within the Residential Resource Area 4 (ReRA4). Under the District Plan Chapter 16.4.7 - Policy - Subdivision Design requires that the design of subdivision, where relevant to the intended use, provides for the following matters:

(g) Facilitates retention of the heritage values of a site or area.

Heritage features and values

Outlined below are the heritage features and values across the Trust's parcels Lot 4 DP339137 and Part Sec 103 and neighbouring land where heritage features on the Trust's parcels are related and connected as heritage systems. This assessment of surveyed heritage pre and post 1900 assesses the impacts of the Water Race Hill subdivision on the remaining heritage features and values and provides an assessment of effects with recommendations to inform the Resource Consent and archaeological authority.

Some of the historic elements on the Water Race Hill site include:

- Water races.
- Sluice faces; Sluice gulches.
- Sludge Channels.
- Tailings – stacked & revetted.
- Old hardwood post and wire fence lines - Ex Farm steading/commonage grazing.
- Coal pits prospects & underground measures
- Old flume/pipeline site – Revell's Gully.
- Artefacts insitu and scatters

Beyond the Water Race Hill subdivision on the wider Lot 4 and Part Sec 103 include the above plus

- Dams/reservoirs.
- Locations of past historic store & stables.
- Ex public reserve.
- Bannockburn Commonage.
- Chinese occupation site with garden areas.

The features are of mining, farm steading and Bannockburn commonage and early town service origins. Past early survey plans record sites of past recreation reserve 1924 (SO35) Ex Stables (SO3935) 1908.

Informed by previous archaeological site records and the initial archaeological survey, front footing the preservation of identified above ground remnant archaeological features involving various gold working sequences; sluice gulches; stacked tailings, sluice channels; main supply water races and branch distribution races; dams; likely farmstead fencing and stabling the subdivision design has worked to avoid and preserve all of the gold working sequences; sluice gulches; stacked tailings, sluice channels; along with preserving some of the old hardwood post and wire fencing and retaining most of two of the three main races, with the upper of the twin water races being proposed for destruction to accommodate subdivision roading and residential lots.

Key heritage features affected by the proposal.

The key heritage features potentially affected by the proposed Water Race Hill subdivision are:

- heritage water races
- historic fences, and
- heritage landscape character.

Each of these features are discussed in the following sections.

Heritage Water Races

Refer to *Appendix 1 figure 3 for details of water races proposed to be retained, removed or repurposed.*

A key revision is to now retain the upper portion of the two twin races F41/369 within Lot 30 (subject to landscape design control mitigation planting either side of the water race invert, to provide visual screening of built form on lots 5, 10-14 from viewpoints east of the site) to the previously proposed destruction of the upper water race. Adaptively repurpose (as already proposed) all of the lower water race into a schist metalled narrow foot path within the remnant water race structure, with appropriate residential drive crossing treatments which allow combined residential driveway use and allow active access and egress along the pedestrian footpath on the adapted downslope water race berm.

With RC2 01 REV C 2023 the upper race portions within road reserve will be destroyed and less legible portions traversing residential Lots 2, 4, & 6 may be modified subject to building platform location and earthworks This portion is losing meaningful legibility and therefore functional interpretation as a water race.

With this revision the key portion of the upper race within Lots 30 and 40 leading to the flume pipe abutment for crossing Revell's Gorge now remains with the lower race being adaptively repurposed as a metal footpath to meaningfully preserve and maintain it as a key part of the wider heritage landscape and gold mining fabric component.

The loss of the other identified minor water components servicing various other minor sluicing's was acknowledged, as was the protecting of the respective Pennyweight Sluice faces and others around the wider perimeter that the subdivision was designed around to preserve. The new road reserve includes sections of twin historic water races; the upper race F41/369 will have southern extents destroyed and disturbed with the lower race a branch of F41/369 will be preserved by adaptive reuse as an active path with respective treatments for roadway and driveway crossings to integrate this new cultural layer of residential development, while enhancing and celebrating the historic features of this unique site.

Apart from the destruction of the southern 40 percent of the upper race F41/369 the majority of the water race proposed for destruction are minor shallow earth bunded invert water races that have low visual appearance, with low structural presence and therefore little meaningful contribution to the wider historic mining system and its interpretation.

Of a total distance of 1704 m of water race:

- 526 m (31%) of 1704 is proposed for destruction.
- 433 m (25%) of 1704 is proposed for retention and preservation.
- 745 m (44%) of 1704 m is proposed for adaptive reuse.
- 1178 m (69%) of 1704 is combined for preservation and adaptive reuse.

Specific effects for affected water races are detailed in Table 9 Revised Table of subdivision effects on archaeological features by proposed subdivision (RC2 01 REV C 2023) by parcel with archaeological comments & recommendations..

Heritage Fences

Refer to *Appendix 1 Figure 7 for details of fences within the subdivision that are proposed to be removed or retained*.

The heritage sections of fence line identified and assessed for removal have been damaged with old tree windfall, lack of maintenance due to retirement from stocking and indiscriminate public access cutting through sections of fence line. Coincidently these more degraded sections are sited between and through proposed parcel lot design. As such they have little residual capacity to contribute as meaningful lot boundary fences. Any posts with salvageable life are being recommended for ongoing repair and maintenance for the heritage fence line identified for retention along the Lot 4 Shepherd's Creek boundary. In practice, if any fence posts are not reused immediately and need to be retained, the fence posts could be stockpiled within Lot 40, and could be utilised by a local volunteer group (such as the Goldfields Heritage Trust) if the posts along the Shepherd's Creek Lot 4 boundary need to be replaced.

The partial removal of a section of the early farmstead fencing boarding Lots 9, 8, 11, 12, 13, & 14 and through Lot 20 was accepted subject to storing and reusing the salvageable old fence posts and material on maintaining the fence lines being retained especially along the Shepherd's Creek Lot 4 boundary in parcel 40.

Of the total length of remaining fencing of 853 m:

- 320 m (37.5%) of fence line will be removed and post salvaged where possible; and
- 533 m (62.5%) of fence line will be retained.

Specific effects for affected fences are detailed Table 9 Revised Table of subdivision effects on archaeological features by proposed subdivision (RC2 01 REV C 2023) by parcel with archaeological comments & recommendations.& Appendix 1 Figure 12 RC2 01 REV C 2023 over SN 1974 – Water Race Hill – Historic fences – retain (green) – remove & reuse (red).

Summary of proposed effects on archaeological features within each new lot to be created by the subdivision including archaeological comment and recommendations.

Refer to *Table* 9 Revised Table of subdivision effects on archaeological features by proposed subdivision (RC2 01 REV C 2023) by parcel with archaeological comments & recommendations..

Heritage Landscape

Criteria for evaluation effects on heritage landscape.

Evaluating Heritage Landscapes (adapted from : Design Manual for Roads and Bridges, Volume 11 Environmental Assessment, Section 3 Environmental, Topics Part 2 Ha 08/07 Cultural Heritage – Scotland)

Individual historic assets, including archaeological remains and historic buildings contribute to historic landscape character, and the key assets should be identified together with an analysis of their contribution to the character of the unit. The value of individual historical or archaeological elements is not necessarily the determinant of the value of the historic landscape character unit to which they contribute. The presence of a scheduled monument (archaeologically 'high value'), for instance, does not necessarily confer great value to the historic landscape character unit in which it is found; and conversely, revetted schist wall ruins ('low value', say, in historic building terms) may be crucial in a 'high value' historic landscape.

Relevant factors to take into account may include:

- local character, local distinctiveness (including local residents' perceptions);
- time-depth: rarity or special interest/typicality (as judged by local, regional and national standards);
- legibility (complexity of the elements/parcels/ components and the completeness or articulation of the historic landscape, association of features, either of the same period or not);
- fragility/robustness (history of change, sensitivity to change, capacity to absorb change);
- cultural associations (including historical events, personages, literary or artistic connections, views);
- research potential (anticipation of further evidence).

Table 6 Evaluating Historic Landscape Character Units

Very High	• World Heritage Sites inscribed for their historic landscape qualities. • Historic landscapes of international value, whether designated or not. • Extremely well preserved historic landscapes with exceptional coherence, time-depth, or other critical factor(s).
High	• Designated historic landscapes of outstanding interest. • Undesignated landscapes of outstanding interest. • Undesignated landscapes of high quality and importance, and of demonstrable national value. • Well preserved historic landscapes, exhibiting considerable coherence, time-depth or other critical factor(s).

Medium	• Designated special historic landscapes. • Undesignated historic landscapes that would justify special historic landscape designation, landscapes of regional value. • Averagely well-preserved historic landscapes with reasonable coherence, time-depth or other critical factor(s).
Low	• Robust undesignated historic landscapes. • Historic landscapes with importance to local interest groups. • Historic landscapes whose value is limited by poor preservation and/or poor survival of contextual associations.
Negligible	• Landscapes with little or no significant historical interest.

(SOURCE : DESIGN MANUAL FOR ROADS AND BRIDGES, VOLUME 11 ENVIRONMENTAL ASSESSMENT, SECTION 3 ENVIRONMENTAL, TOPICS PART 2 HA 08/07 CULTURAL HERITAGE - SCOTLAND)

In developing or adopting methodologies for assessing the role of an asset's setting the archaeologist should bear in mind the principles summarised below:

- an asset's setting is its **relevant** surroundings;
- settings have **physical factors** which can be changed by a scheme, but it is the effect these changes have on the perception of the asset that is assessed;
- **context** is an aspect of setting where a relevant aspect of knowledge, belief or relationships may not be visible (or audible) at the site;
- settings are **experienced by people** as contributing to the understanding or appreciation of assets;
- **professional judgement** is required, using criteria measured against the scheme's Cultural Heritage Design Objectives.

Impacts caused by the project on many similar, possibly minor, historic elements may be cumulative, but for historic landscape character units such impacts may best be assessed as the totality of their impact on the historic landscape character unit. The assessment of such multiple impacts is not simply a matter of aggregating scores; it requires professional judgement to assess how these changes actually affect the character of the historic landscape unit.

Magnitude of an impact

The assessment should judge the magnitude of an impact bearing in mind the extremes that could occur, not just the range of changes that would occur on the scheme under consideration. The largest would be a total change to the historic character; the least would be no change to the historic character. The changes should be ranked in relation to these extremes. The scale of the magnitude of impact is as follows:

- Major;
- Moderate;
- Minor;
- Negligible;
- No change.

The factors to take into account in assessing the magnitude of the impact on historic landscape character include:

- how changes to archaeological remains and historic buildings would change the character of the historic landscape;

- changes affecting historic spatial patterns;
- changes of characteristic historic landscape elements;
- changes to vegetation;
- changes in vibration/visual intrusion/noise (including the nature of sounds);
- changes to landuse.

The important principle is the magnitude of the impact on the historic landscape character unit. If an historic landscape unit has been characterised as – say – a late 20th century transport and industrial corridor, then the addition of a new transport element may have little or no impact on its historic character, despite a large land-take and possibly considerable negative impacts on other cultural heritage assets. There could be little or no historic landscape character change. Conversely, a new dual carriageway, which may have no significant impacts on archaeological remains or historic buildings, built across an otherwise coherent and relatively untouched pre-enclosure landscape unit may change it into urban edge-land, a considerable alteration.

Table 7 Magnitude of Impact: Summary of Factors in the Assessment of Magnitude of Change

Factors in the Assessment of Magnitude of Change	
Major	Change to most or all key historic landscape elements, parcels or components; extreme visual effects; gross change of noise or change to sound quality; fundamental changes to use or access; resulting in total change to historic landscape character unit.
Moderate	Changes to many key historic landscape elements, parcels or components, visual change to many key aspects of the historic landscape, noticeable differences in noise or sound quality, considerable changes to use or access; resulting in moderate changes to historic landscape character.
Minor	Changes to few key historic landscape elements, parcels or components, slight visual changes to few key aspects of historic landscape, limited changes to noise levels or sound quality; slight changes to use or access: resulting in limited changes to historic landscape character.
Negligible	Very minor changes to key historic landscape elements, parcels or components, virtually unchanged visual effects, very slight changes in noise levels or sound quality; very slight changes to use or access; resulting in a very small change to historic landscape character.
No change	No change to elements, parcels or components; no visual or audible changes; no changes arising from in amenity or community factors.

Assessing Significance of Effects

The significance of the effect - that is, the extent to which the change to the historic landscape character matters – is the result of the value of the historic landscape character unit combined with the magnitude of the impact on it (incorporating the agreed mitigation). A large negative impact on a valuable historic landscape character unit would matter more than a large negative impact on a commonplace character unit. For instance, a new road scheme might totally change a late 20th century industrial landscape (historic landscape value: negligible) into a 21st century transport and communications landscape (value also negligible), so despite the high magnitude of impact (major change), when combined with the low value it would result in a slight or neutral significance of effect.

The judgement of the significance of effect should use the following scale:

- Very Large;

- Large;
- Moderate;
- Slight;
- Neutral.

Table 8 Significance of Effects Matrix

VALUE						
	Very High	Neutral	Slight	Moderate/ Large	Large or Very Large	Very Large
	High	Neutral	Slight	Moderate/ Slight	Moderate/ Large	Large/Very Large
	Medium	Neutral	Neutral/ Slight	Slight	Moderate	Moderate/ Large
	Low	Neutral	Neutral/ Slight	Neutral/ Slight	Slight	Slight/ Moderate
	Negligible	Neutral	Neutral	Neutral/ Slight	Neutral/ Slight	Slight
		No change	**Negligible**	**Minor**	**Moderate**	**Major**
		MAGNITUDE OF IMPACT				

Heritage Landscape Character values

Using the heritage landscape assessment of effects criteria applied over the Lot 4 encompassing the heritage features linked and associated with and into adjacent land parcels this area ranks medium for heritage Landscape Character under Table 6 Evaluating Historic Landscape Character Units

The site qualifies as being an undesignated historic landscape that would justify special historic landscape designation, a landscape of regional value; with averagely well-preserved historic landscapes with reasonable coherence, time-depth, and rich and diverse array of historic industries. The heritage landscape has high context to the main street, nearby heritage landscapes (private & public) along the historic Kawarau River terrace sequences, in particular the Landmark Bannockburn Sluicing's Historic Reserve. The prominent landforms of Slaughteryard Hill and Water Race Hill off Terrace Road between Shepherd's and Revell's Gorges have their own significant contribution to the wider landscape and past cultural history.

The setting from a wide view is experienced and appreciated by locals and the wider community and while some disturbance and modification has occurred in portions, the whole is an appreciated asset.

Magnitude of impact on the Heritage Landscape

The water race hill subdivision proposal will have moderate effect on the heritage landscape through its visual intrusion on what is at present an open and legible landscape with the past endeavours, particularly of alluvial goldmining and farm steading clear and present on the current landscape.

Coalmining and Antimony mining and past commercial main street activity are obscure and negligible without guidance and interpretation. The spatial patterns and features of water races, reservoirs, sluicing's, tailings and sludge channels can be seen in visual context as whole complex and industrial system. These features are largely intact and untouched since the gold miners, early settlers and later coalminers moved on.

Using Table 7**Error! Reference source not found.** in the Assessment of Magnitude of Change the Heritage Landscape the site sits between Minor to Moderate magnitude of impact.

While the number of physical elements changed are few and moderate in scale of physical impact, the visual change and intrusion of the residential subdivision is noticeable to many aspects of the heritage landscape resulting in moderate changes to the historic landscape character.

Effects on heritage landscape character

In summary, using Table 6 Evaluating Historic Landscape Character Units, the heritage landscape is assessed with medium value and using Table 7 Magnitude of Impact, magnitude of impact was assessed as minor to moderate. Applying the significance effects matrix at Table 8, the overall effect of the proposed subdivision on heritage features is assessed as being slight to moderate impact.

Assess the potential effects of the proposed work on the archaeological site/s, including effects on the physical remains of the site/s as well as the effects on the relevant archaeological values discussed in the previous chapter.

Loss of legibility and need for interpretation panels.
The assessment of significance in archaeological terms has been described above under the archaeological values section. The assessment of effects in RMA heritage in terms of magnitude of effects is challenging when a new multi-dimensional layer/s in terms of residential subdivision is introduced into the heritage landscape. Because while as individual historic features and heritage system components can be retained and protected their legibility, context and interpretation becomes diluted and less coherent.

The apportioning of effect from the subdivision proposal is problematic. This is because while in percentage terms the destruction and loss can appear medium to low in terms of physical amount of the component element affected; the interpretation and appreciation of the wider heritage system and its contribution becomes more challenging across a heritage landscape and heritage system when such large new physically and visually disruptive new element is introduced. The compounding and unrecorded aggregate of minor of previous heritage destruction is cumulative. Prior to this subdivision documented archaeological sites destroyed are the remains of the Patterson & Co dam (F41/366) and the upper sections Pennyweight Sluicing's F41/368, the southern sluice faces of Revell's Basin sluicing's (F41/365) along with an unrecorded Terrace St Dam (Location #175 BHP) and schist hut dwelling (Location #412 BHP) have been destroyed and modified.

So, while the losses to heritage water race components are deemed low in physical lineal terms and in archaeological contribution, what remains now needs meaningful interpretation to explain the dislocated remains and their function within what was a larger more complete coherent heritage system and landscape.

The heritage fencing affects physically are similar, being deemed low, however they also now need meaningful interpretation and on-going preservation as so little this heritage fencing feature remains.

For mitigation from the loss to elements of the water races and fencing, good interpretation will be essential to meaningfully interpret what is being retained and preserved. Good understanding will engender appreciation and stewardship going forward and enhance the recreational trail experience especially for key values contained in Lots 30, 40, 51 & 50.

Below surface features/fabric and above ground remnants - need for archaeological authority

It is likely given its sequences of gold mining, farm steading and Bannockburn commonage use, that the Water Race Hill land will have subsurface features such as artefact scatters and possible foundation remnants from miner camps/huts, and or stabling structures, remaining in-situ. These may be intercepted and or disturbed during subdivision earth works development, roading and services installation, along with subsequent residential development for the new dwellings and or with trenching and excavation associated with telecoms, water, power and waste services.

Given the complex sequences of mining use, farmsteading and Bannockburn commonage use and later twentieth century property clearance below surface features may have been damaged and or disturbed. This is certainly the case with the likely destruction lined sluiced box channelling system down through the remaining section of Pennyweights by the installation of stormwater and waste services by CODC without any assessment or archaeological authority. With the new subdivision waste and stormwater services connecting into the CODC services in Pennyweights, this trenching should be monitored for possible remnant sluice box channelling and accidental discovery.

It is the combination of above ground remnants that need to be adaptively reused and or modified and or destroyed plus the below surface earth works which trigger and require an archaeological authority application with supporting assessment to inform and guide recommendations for the archaeological authority for earth works monitoring and possible investigation (if archaeological feature/s and or artefacts are disturbed).

Table 9 summarises by revised subdivision plan (RC2 01 REV C 2023) effects on archaeological features within each lot, with revised archaeological protection notation, protection detail, specific archaeological comment and recommendation.

Table 9 Revised Table of subdivision effects on archaeological features by proposed subdivision (RC2 01 REV C 2023) by parcel with archaeological comments & recommendations.

Proposed Lot #	Archaeological protection notation RC2 01 REV C	Revised protection	Archaeological Comment	Archaeological Recommendation
1	retain & protect (blue)shallow sluicing's water race & sluice face (yellow)	Lot 50 incorporates and protect west facing terrace sluice face off Lot 1 & pedestal mining claim boundary marker 2. Apply for authority to modify/destroy water race (red) & retain(blue) water race.	The (red) water race is a shallow small hollow depression on gently sloping ground with turnouts to the sluice faces - minor - discrete - low legibility. Sluiced terrace faces on the west boundary of Lot 1 - high presence and legibility and pedestal claim marker has historic value as a past mining claim boundary marker incorporated into Lot 50	Apply for authority to modify/destroy (red) water race. Retain (blue) water race along edge of western sluice face. Western sluice face incorporated with pedestal claim boundary marker 2 into Lot 50 parcel.
2	No above ground features identified for formal protection (Part of Lot 2 was previously part of upper Pennyweights sluiced workings now destroyed)	Apply for archaeological authority to destroy water race portions marked (red) on plan traversing road reserve and lots 2, 6, 4,100 & 101. (F41/369 Upper water race)	Remnants of recorded water race ex Patterson's Dam (Upper Water Race Hill Race F41/3690 medium earth bund race with some schist face elements, traversing portions of road reserve and Lots 2, 4, 6, 100 & 101 are being heavily dissected by road crossings, car parking and driveways and residential parcels. Highly fragmented & loss of connectivity and therefore legibility for meaningful interpretation. .	Apply for archaeological authority to destroy portions marked (red) on plan traversing lot 2. Mitigation required for offsetting destruction. Implementing adaptive reuse of remaining components for Surface Hill water races and Shepherds Creek Water Race for public footpath and walking trails with interpretative historical panel is commensurate. New lot owners may opt to work around and retain elements of water race within their land parcel

Proposed Lot #	Archaeological protection notation RC2 01 REV C	Revised protection	Archaeological Comment	Archaeological Recommendation
3	No above ground features identified for formal protection (Part of Lot 3 was previously part of upper Pennyweights sluiced workings now destroyed)			
4	No above ground features identified for formal protection	Apply for archaeological authority to destroy portions marked (red) on plan traversing road reserve and lots 2, 6, 4,100 & 101. (F41/369 Upper water race)	Remnants of recorded water race ex Patterson's Dam (Upper Water Race Hill Race F41/3690 medium earth bund race with some schist face elements, traversing portions of road reserve and Lots 2, 4, 6, 100 & 101 are being heavily dissected by road crossings, car parking and driveways and residential parcels. Highly fragmented & loss of connectivity and therefore legibility for meaningful interpretation. Apply for archaeological authority to destroy portions marked (red) on plan traversing road reserve and lots 3, 8, 100 & 102. Mitigation required for offsetting destruction.	Apply for archaeological authority to destroy portions marked (red) on plan traversing lot, 4. Mitigation required for offsetting destruction. Apply for archaeological authority and implementing adaptive reuse of remaining components for Surface Hill water races and Shepherds Creek Water Race for public footpath and walking trails with interpretative historical panel is commensurate. New lot owners may opt to work around and retain elements of water race within their land parcel
5	No above ground features identified for formal protection			
6	No above ground features identified for formal protection	Apply for archaeological authority to destroy portions marked (red) on plan traversing road reserve and lots 2, 6, 4,100 & 101. (F41/369 Upper water race)	Remnants of recorded water race ex Patterson's Dam (Upper Water Race Hill Race F41/3690 medium earth bund race with some schist face elements, traversing portions of road reserve and Lots 2, 4, 6, 100 & 101 are being heavily dissected by road crossings, car parking and driveways and residential parcels. Highly fragmented & loss of	Apply for archaeological authority to destroy portions marked (red) on plan traversing 6. Mitigation required for offsetting destruction. Apply for archaeological authority and implementing adaptive reuse of remaining components for Surface Hill water races and Shepherds Creek Water Race for public footpath and walking trails with interpretative historical panel is commensurate. New lot owners may opt to work around and retain elements of water race within

Proposed Lot #	Archaeological protection notation RC2 01 REV C	Revised protection	Archaeological Comment	Archaeological Recommendation
			connectivity and therefore legibility for meaningful interpretation. Apply for archaeological authority to destroy portions marked (red) on plan traversing road reserve and lots 3, 8, 100 & 102. Mitigation required for offsetting destruction.	their land parcel.
7	No above ground features identified for formal protection			
8		Apply for archaeological authority to remove section of hardwood post & wire fence line & repurpose hardwood posts	Hardwood post and wire fence along shared private parcel boundaries will be lost to public interpretation and meaningful preservation (Lots 9, 8, 12, 11, 101, & 20). Seek archaeological authority to remove hardwood posts and be reused supplementing the existing historic fence along Shepherds Creek within Lot 40	Seek archaeological authority to remove hardwood posts (Lots 8) and be reused supplementing the existing historic fence along Shepherds Creek within Lot 40 and adaptive reuse of water race (recorded historic site F41/372 Shepherds Ck water race) as public walking track. Potential for post reuse in delineating viewing area
9	retain & protect (blue) shallow sluicing's water race bordering Pennyweight sluicing F41/368 Lot 51 (excepting branch (red)) in Lot 9 bordering Lot 8	Apply for authority to modify/destroy (red) branch water race Lot 9 (supplied from F41/369 Upper water race)	Small sluiced gulch with discharge out into Revell's Gorge. Sluiced by (red) small shallow water race from south that branches west beside gulch. Minor - discrete - low legibility. Apply for authority to modify/destroy.	Sluice gulch incorporated into Lot 51. Apply for authority to modify/destroy (red) branch water race.
		Apply for archaeological authority to remove section of hardwood post & wire fence line & repurpose hardwood posts	Hardwood post and wire fence along shared private parcel boundaries will be lost to public interpretation and meaningful preservation (Lots 9, 8, 12, 11, 101, & 20). Seek archaeological authority to remove hardwood posts and be reused supplementing the existing historic fence	Seek archaeological authority to remove hardwood posts (Lots 9,) and be reused supplementing the existing historic fence along Shepherds Creek within Lot 40 and adaptive reuse of water race (recorded historic site F41/372 Shepherds Ck water race) as public walking track. Potential for post reuse in delineating viewing area

Proposed Lot #	Archaeological protection notation RC2 01 REV C	Revised protection	Archaeological Comment	Archaeological Recommendation
			along Shepherds Creek within Lot 40	
10	No above ground features identified for formal protection			
11		Apply for archaeological authority to remove section of hardwood post & wire fence line & repurpose hardwood posts	Hardwood post and wire fence along shared private parcel boundaries will be lost to public interpretation and meaningful preservation (Lots 9, 8, 12, 11, 101, & 20). Seek archaeological authority to remove hardwood posts and be reused supplementing the existing historic fence along Shepherds Creek within Lot 40	Seek archaeological authority to remove hardwood posts (Lots 11,) and be reused supplementing the existing historic fence along Shepherds Creek within Lot 40 and adaptive reuse of water race (recorded historic site F41/372 Shepherds Ck water race) as public walking track.
12		Apply for archaeological authority to remove section of hardwood post & wire fence line & repurpose hardwood posts	Hardwood post and wire fence along shared private parcel boundaries will be lost to public interpretation and meaningful preservation (Lots 9, 8, 12, 11, 101, & 20). Seek archaeological authority to remove hardwood posts and be reused supplementing the existing historic fence along Shepherds Creek within Lot 40	Seek archaeological authority to remove hardwood posts (Lots 12) and be reused supplementing the existing historic fence along Shepherds Creek within Lot 40 and adaptive reuse of water race (recorded historic site F41/372 Shepherds Ck water race) as public walking track.
13	No above ground features identified for formal protection			
14	parcel bdy offset 1.5m off water race (F41/369 Upper water race);		Parcel bdy of Lot 14 offset 1.5m off water race and water race incorporated into Lot 40.	
15	No above ground features identified for formal protection			
16, 17, 18 & 19		Apply for authority to modify/destroy (red) sections of branch water race that traverses Lots	Shallow cryptic branch water races off the (linked to Lower Water Race Hill Race) F41/369) have been	Apply for archaeological authority to modify/destroy water race branches traversing Lots 16, 17, 18 & 19. No ongoing protection volunteered

Proposed Lot #	Archaeological protection notation RC2 01 REV C	Revised protection	Archaeological Comment	Archaeological Recommendation
		16, 17, 18, & 19. And Lot 20 below	modified with new wild flood water races and now have very low legibility and interpretative value and contribute little historic value.	although new lot owners may elect to retain portions and integrate as part of the site development
20		Apply for archaeological authority to remove section of hardwood post & wire fence line & repurpose hardwood posts. Apply for authority to modify/destroy (red) sections of branch water race that traverses Lots 20 & Lots 16, 17, 18 & 19 above.	Hardwood post and wire fence along shared private parcel boundaries will be lost to public interpretation and meaningful preservation (Lots 9, 8, 12, 11, 101, & 20). Seek archaeological authority to remove hardwood posts and be reused supplementing the existing historic fence along Shepherds Creek within Lot 40 Shallow cryptic branch water races off the (linked to Lower Water Race Hill Race F41/369) have been modified with new wild flood water races and now have very low legibility and interpretative value and contribute little historic value	Seek archaeological authority to remove hardwood posts (Lots 9, 8, 12, 11, 101, & 20) and be reused supplementing the existing historic fence along Shepherds Creek within Lot 40and adaptive reuse of water race (recorded historic site F41/372 Shepherds Ck water race) as public walking track. Apply for archaeological authority to modify/destroy water race branches traversing Lot 20. No ongoing protection volunteered although new lot owners may elect to retain portions and integrate as part of the site development
30 (Reserve)		Apply for archaeological authority to modify/disturb portions marked (blue) on plan traversing lots 30. (F41/369 Upper water race)	Remnants of recorded water race ex Patterson's Dam (Upper Water Race Hill Race F41/369) medium earth bund race with some schist face elements, traversing portions of road reserve and Lots 30 & 40 are being dissected by 2 track crossings, and disturbed by landscape mitigation planting above and below the water race invert. The track will dissect the water race and the landscape design control mitigation planting will while retaining the physical structure will screen and fragment visibility. Resulting in a loss	Apply for archaeological authority to disturb upper water race 150 m within Lot 30 associated with track crossing and landscape design control mitigation planting proposed within Lot 30 to provide visual screening of built form on lots 5, 10-14. Planting to avoid the water race invert.

Proposed Lot #	Archaeological protection notation RC2 01 REV C	Revised protection	Archaeological Comment	Archaeological Recommendation
		Apply for archaeological authority for adaptive reuse 267m of lower water race as footpath and destruction of 3 sections for roadway/driveways and 2 sections for pathways & single track crossings totalling 10m (F41/369 linked lower water race)	of connectivity and therefore legibility for meaningful interpretation as twin water races. Remnants of recorded water race ex Patterson's Dam (linked Lower Water Race Hill Race) F41/369) medium earth bund race with some schist face elements, traversing portions of road reserve Lots 30,100 & 101 have for preservation by adaptive reuse of the downslope bund into path with 3 road/driveway crossing and 2 for pathways & single-track crossings totally 10m leaving 267m for reuse as path.	Apply for archaeological authority for adaptive reuse 267m of lower water race as footpath and destruction of 2 sections for pathways/track crossings totalling 10m out of total 342m
40 (balance Lot North & East boarders)	Within Lot 40 preserve lower remnants sluicing's Penny weights & others; water race remnants; hand revetted stacked wall sections; hardwood post and wire fence line remnants x 2; hand stacked tailings;	Apply for an archaeological authority to adaptively reuse the water race F41/372 as public walking track within Lot 40.	A recorded historic race F41/372 along Shepherds Creek servicing various working down Shepherds creek and around into Revell's Gully. It's proposed in the application for an archaeological authority to adaptively reuse the water race as a public walking track within Lot 40. This provides through adaptive reuse some protection and ongoing management along with some heritage appreciation of the water race and associated gold mining and coal mining. Adopting and implementing this provides some mitigation for the modification and destruction of minor water races and the relocation of the hardwood fence posts along the water race. Shallow cryptic branch	Apply for an archaeological authority to adaptively reuse the water race as public walking track within Lot 40.

Proposed Lot #	Archaeological protection notation RC2 01 REV C	Revised protection	Archaeological Comment	Archaeological Recommendation
		Apply for archaeological authority to destroy portions marked (red) on plan	water races off the (linked to Lower Water Race Hill Race) F41/369) have very low legibility and interpretative value and contribute little historic value. Apply for archaeological authority to modify/destroy water race branches traversing Lots 16, 17, 18, 19 &20	Apply for archaeological authority to destroy portions marked (red) on plan. New lot owners may opt to work around and retain elements of water race within their land parcel
50 (balance lot)		Lot 50 incorporates and protect west facing terrace sluice face off Lot 1 & pedestal mining claim boundary marker 2. Include archaeological protection rule in Lot 50 to protect these features. (F41/385 Revell's Gully Sluicing's)	Sluiced terrace faces on the west boundary of Lot 1 - high presence and legibility and pedestal claim marker has historic value as a past mining claim boundary marker	Western sluice face off Lot 1 with pedestal claim boundary marker 2 incorporated into Lot 50 parcel bdy Include archaeological protection rule in Lot 50 to protect these features & F41/385 Revell's Basin working & wrs.
51	retain & protect (blue) shallow sluicing's water race bordering Pennyweight sluicing & the sluicing's F41/368 (excepting branch (red) in Lot 9)	Apply for authority to modify/destroy (red) branch water race Lot 9 (supplied from F41/369 Upper water race)	Small sluiced gulch with discharge out into Revell's Gorge. Sluiced by (red) small shallow water race from south that branches west beside gulch. Minor - discrete - low legibility. Apply for authority to modify/destroy	Sluice gulch incorporated into Lot 51 & bottom into Lot 40. Apply for authority to modify/destroy (red) branch water race in Lot 9.
100 (road)		Apply for archaeological authority to destroy portions marked (red) on plan traversing road reserve lots 100 & 101. (F41/369 Upper water race) Apply for archaeological authority for adaptive	Remnants of recorded water race ex Patterson's Dam (Upper Water Race Hill Race F41/369 medium earth bund race with some schist face elements, traversing portions of road reserve and Lots 6, 2, 4,100 & 101 are being heavily dissected by road crossings, car parking and driveways and residential parcels. Highly fragmented & loss of connectivity and therefore legibility for meaningful interpretation. Mitigation required for offsetting destruction. Remnants of recorded water race ex Patterson's	Apply for archaeological authority to destroy portions marked (red) on plan traversing road reserve,100 & 101. Mitigation required for offsetting destruction. Apply for archaeological authority and implementing adaptive reuse of remaining components for Surface Hill water races and Shepherds Creek Water Race for public footpath and walking trails with interpretative historical panel is commensurate. Apply for archaeological authority for adaptive reuse 267m of lower water race as

Proposed Lot #	Archaeological protection notation RC2 01 REV C	Revised protection	Archaeological Comment	Archaeological Recommendation
		reuse 267m of lower water race as footpath and destruction of 3 sections for road way/driveways and 2 for pathways & single track crossings totalling 50m (F41/369 linked lower water race)	Dam (linked Lower Water Race Hill Race) F41/369) medium earth bund race with some schist face elements, traversing portions of road reserve Lots 30,100 & 101 have for preservation by adaptive reuse of the downslope bund into path with 3 road/driveway crossing and 2 for pathways & single track crossings totally 50m leaving 267m for reuse as path.	footpath and destruction of 5 sections for roadway/driveways/pathways/track crossings totalling 50m out of total 342m
101 (road)		Apply for archaeological authority to destroy portions marked (red) on plan traversing road reserve lots 100 & 101. (F41/369 Upper water race)	Remnants of recorded water race ex Patterson's Dam (Upper Water Race Hill Race F41/3690 medium earth bund race with some schist face elements, traversing portions of road reserve and Lots 3, 8, 100 & 101 are being heavily dissected by road crossings, car parking and driveways and residential parcels. Highly fragmented & loss of connectivity and therefore legibility for meaningful interpretation. Mitigation required for offsetting destruction.	Apply for archaeological authority to destroy portions marked (red) on plan traversing road reserve and lots 3, 8, 100 & 101. Mitigation required for offsetting destruction. Apply for archaeological authority and implementing adaptive reuse of remaining components for Surface Hill water races and Shepherds Creek Water Race for public footpath and walking trails. Recommend as mitigation for water race destruction an interpretative historical panel be installed off the carpark end in parcel 40 to explain the past history of the site and locality.
		Apply for archaeological authority to remove section of hardwood post & wire fence line & repurpose hardwood posts	Hardwood post and wire fence along shared private parcel boundaries will be lost to public interpretation and meaningful preservation (Lots 9, 8, 12, 11, 101, & 20). Seek archaeological authority to remove hardwood posts and be reused supplementing the existing historic fence along Shepherds Creek within Lot 40	Seek archaeological authority to remove hardwood posts (Lots 9, 8, 12, 11, 101, 30 & 20) and be reused supplementing the existing historic fence along Shepherds Creek within Lot 40 and adaptive reuse of water race (recorded historic site F41/372 Shepherds Ck water race) as public walking track.

Heritage Landscape

As discussed, it is the sum of all the heritage elements and their associations, connectively into industrial and commercial heritage systems that combine to make this a locally appreciated and valued heritage landscape and subset on the much wider Bannockburn heritage landscape.

In summary using Table 8 Significance of Effects Matrix we have a heritage landscape assessed with medium value and with magnitude of impact assessed as minor to moderate with matrix effect of a slight to moderate impact.

Discussion

As indicated earlier all these minor effects continue to accumulate. They are not documented or reassessed for their compounding effects. We have currently no complete or up to date heritage inventory nor is there any existing heritage register with a significance or priority ranking to inform decision making. Currently the Otago Goldfields Trust Heritage Review on current results is locating four new previously unrecorded sites to every existing current recorded site. Its funding is now used up and further reviews have halted with much outstanding heritage survey work still to be done.

The reductionist approach, apportioning of effect from the subdivision proposal to just individual elements is problematic. This is because while in percentage terms the destruction and loss can appear medium to small in terms of physical amount of the component element affected; in terms of contribution to interpretation and appreciation across the wider heritage system, it can be more detrimental across a heritage landscape and heritage system especially when such new large, physically and visually disruptive element is introduced into it.

Management plan

A management plan will be prepared for the subdivision construction phase so that all the considered design and planning for the heritage and landscape values are not lost by construction earthworks, roading, and subdivision services installation.

This will involve contractor archaeological briefings; archaeological feature marking and physical barrier fencing; along with archaeological site monitoring and investigation for accidental discovery.

This will support the archaeological authority and inform the archaeological authority consent conditions.

Consider whether the likelihood for future damage to the site/s will increase/ decrease due to the proposed work.

There has been a high level of design and significant investment in identifying remaining heritage values and incorporating them into the Water Race Hill subdivision and respecting the wider Trust's property potential. These heritage values with the significant landscape attributes have been considered and sensitively designed into the subdivision. Setting this up, as a very desirable and sought after place to live work and play.

To protect and capitalise the identified heritage valves for preservation and integration into the subdivision a heritage management plan must be integrated into the subdivision especially for lots 30 and 40 where with this revised subdivision plan, the bulk of the heritage sites and values remain. The heritage management plan must manage construction and residential development phases so the heritage values within and adjoining come through the construction phase and remain to distinguish this subdivision and are not accidentally or inadvertently damaged or destroyed.

State if there are any other options available to the client. This may involve consideration made as to alternate proposals, amendments to designs to avoid/minimise impact on site/s. Have these been discussed with the relevant parties? Can any sites or features be avoided? If not explain why

This project is an example of best practise for identifying heritage and landscape values initially and then with informed considered design between Landpro survey and subdivision planning; Rough & Milne Landscape architects; Kopuwai Archaeology; Saunders & Co and Town Planning RMA advice and project coordination, in collaboration with clients DJ Jones and NR Searell Family Trusts.

There is a high degree of recognition from all parties that the Water Race Hill has and is something unique and different which has endeared all to focus and make the most out of the combined attributes and challenges of this site and project.

This has been a collaborative effort and journey to this point, and I professionally feel this is a well-considered and thought-out design.

Consider whether any preliminary investigation would be warranted (e.g. geo-physical survey, exploratory investigation)

Based on desk top research and above ground archaeological survey, acknowledging some limitations, there is no obvious evidence pointing to a specific site, to warrant any site preliminary investigation within the subdivision footprint. This said, as indicated within the report there is potential for below surface accidental discovery of possible hut foundations, cess pits and artefacts scatters.

With the proposed destruction and modification of some parts of the upper water race (F41/369), this presents an opportunity to record some cross-sectional cuts through a couple of section to assess and record dimensions and sediment layers from use as a water race. It needs to be noted more recent use was for irrigation purposes.

As noted above there may be an opportunity with the connection of this proposed subdivisions waste and stormwater services into the CODC system in Pennyweights Gully, to understand what gold recovery structure was in Pennyweights, through monitoring of trenching.

Further Considerations

Site Management

To protect and capitalise the identified heritage values for preservation and integration into the subdivision a heritage management plan must be integrated into the subdivision construction and residential development phases, so the values come through the construction phase and remain to distinguish this subdivision and are not accidentally or inadvertently damaged or destroyed.

In terms of the subdivision and heritage stewardship the installation of a heritage panel detailing and interpreting what remains and how to care for it will help empower community care and stewardship into the future. Outside of the residential and roading components of the subdivision but within Lot 30 and 40 there is a significant array of identified remnants. As a local reserve these need to be managed and preserved. Any earth disturbance needs to be informed by the archaeological plans within this assessment. Spatial data is available. Reference is drawn to the principles and practices of the NZ ICOMOS Charter where proposals involve remediation, replication or removal of structures or archaeological sites. Refer *Appendix 1 ICOMOS New Zealand Charter for the Conservation of Places of Cultural Heritage Value Revised 2010 83*

Analysis, Collections Management and Report Writing

During the monitoring of the subdivision construction if archaeological material is revealed/discovered it will be assessed and photographed in situ and carefully removed bagged and labelled for further diagnostic analysis in terms of best archaeological practise. These along with post construction survey and photographs will be used to update NZAA site records and be complied into a final report as part of the condition of the archaeological authority when issued.

Recommendations

Recommendations regarding water races

1. Retention of 140m within Lot 30, destruction of 98m within proposed road reserve Lots 100 & 101 and potential modification of 78m within residential lots 2,4 & 6 of the upper twin water race: with the new subdivision design the upper water race will have 140m retained within potential recreation reserve Lot 30 *(subject to design control landscape mitigation screen planting) which preserves the water race invert but will obscure its legibility and connectivity to the wider heritage landscape features)* and have 98m destroyed by 3 subdivision road and a track crossings and 78m subject to potential modification within residential lots 2 4 & 6. The destruction and modification is over the less legible portions but retains key remains within Lot 30 though now obscured by landscape mitigation screen planting that compromises the legibility and connectivity to the more meaningful portion of the twin races that served Revells Gully and significantly with the upper race by long gone likely impressive flume/piped crossing over Revells Gully to Slaughter Yard hill reservoir F41/399 & McLellan& Burrows workings and coal pits F41/403 east off Slaughter Yard Hill. Within Lots 30 & 40 it remains physically functional for preservation and interpretation as a water race to the flume pipe abutment off Revells Gully. So, the upper water race marked on Figure 7 as blue →→→ will be preserved and red -→→→ will be proposed for modification and destruction.

2. Adaptive reuse of the lower twin water race: The lower water race (a branch linked to the upper water race) will be adaptively repurposed as a metalled footpath and emergency stormwater in order to meaningfully preserve and maintain it as a key part of the wider heritage landscape and gold mining fabric component. The water race will be preserved along the upslope berm and invert, with the downslope bund flattened and surfaced for use as a subdivision pedestrian path with five shared roadway/driveway crossing treatments as specified in Figure 7 & Refer to *Appendix 1 figure 3 for details of water races proposed to be retained, removed or repurposed.*

3. Informal use of the Shepherd's Creek water race (F41/372) as a marked trail (no ground modification required):
   It is proposed for an archaeological authority to adaptively reuse the Shepherd's Creek water race (F41/372) as an informal walking trail within Lot 40.

   No modification would be required to the trail, other than some pegging/trail marking, and some bramble vegetation clearance. The exact route that the trail will take is yet to be determined, in lieu of an additional site visit to identify a logical and achievable route.

   The proposed Shepherd's Creek water race walking trail will provide, through adaptive reuse, some protection and ongoing management along with some heritage appreciation of the water race and associated gold mining and coal mining. Adopting and implementing this provides some mitigation for the modification and destruction of minor water races and the relocation of the hardwood fence posts along the water race.

4. Apply for an archaeological authority for the recommended destruction/modification of water races:
   An archaeological authority under Section 44 of the Heritage New Zealand Pouhere Taonga Act (2014) should be obtained from Heritage New Zealand prior to ground disturbing works. Refer Table 9 for a list of archaeological features by subdivision lot number with recommendations against specific lots.

Recommendations regarding fencing

5. Removal and relocation of certain hardwood fences: the partial removal of a section of the early farmstead fencing is recommended, subject to storing and reusing these old fence posts when maintaining those fence lines that are being retained especially along the Shepherd's Creek Lot 4

boundary. Refer Figure 7 & Refer to *Appendix 1 Figure 7 for details of fences within the subdivision that are proposed to be removed or retained*.

6.

In practice, if any fence posts are not reused immediately and need to be retained, the fence posts could be stockpiled within Lot 40, and could be utilised by a local volunteer group (such as the Otago Goldfields Heritage Trust) if the posts along the Shepherd's Creek Lot 4 boundary need to be replaced; and

7. Apply for an archaeological authority for the recommended destruction/modification of fencing: An archaeological authority under Section 44 of the Heritage New Zealand Pouhere Taonga Act (2014) should be obtained from Heritage New Zealand prior to ground disturbing works. Refer Table 9 for a list of archaeological features by subdivision lot number with recommendations against specific lots.

Recommendations regarding management of works

8. General care and effort to preserve heritage or archaeological sites: As a first principle, every practical effort should be made to avoid damage to any heritage or archaeological site, whether known, or discovered during any redevelopment of the site. Care will need to be taken during the redevelopment of the property to avoid accidental damage to pre-1900 structures, both above and below ground, as a result of machine operation and site access.

9. Archaeological monitoring:
    a. all ground disturbing works should be monitored by an archaeologist, when works are deemed likely to affect an archaeological site. Ground disturbing works include, but are not limited to, vegetation clearance, removal of debris and levelling off the ground within the roading, installation of subdivision services – power water telecoms, waste stormwater, landscaping building footprints, contouring/scraping, and excavation.
    b. Any archaeological features or recovered material should be appropriately recorded and analysed.
    c. Care will need to be taken during the new residential subdivision development of the property to avoid accidental damage to pre-1900 structures, both above and below ground, as a result of machine operation and site access.
    d. If at any stage during the redevelopment pre-European material is discovered, local iwi should be consulted in the first instance. If pre-European material does exist in the area to be developed, damage to this should be minimised.
    e. A full report on any archaeological material that is found should be prepared and submitted to Heritage New Zealand within one year of commencement.

10. Monitoring of works in the Pennyweights Gully: with this new subdivision wastewater and stormwater connecting into the CODC services in Pennyweights, this trenching should be monitored for possible remnant sluice box channelling and accidental discovery.

11. Preparation of an Archaeological/Heritage Management Plan:
    a. The required archaeological authority must be exercised in accordance with an Archaeological/Heritage Management Plan ("Management Plan" commissioned, or prepared with archaeological advice, by the Authority Holder, in order to protect and capitalise the identified heritage values for preservation and integration into the subdivision.
    b. The Management Plan must be integrated into the subdivision construction and residential development phases, so the values come through the construction phase and remain to distinguish this subdivision and are not accidentally or inadvertently damaged or destroyed.

c. The Management Plan shall provide operational guidelines and procedures for day-to-day activities that may affect archaeological sites during works.
d. The Management Plan shall include, but is not limited to, the following:
    i. on-site briefing by approved archaeologist for contractors about the archaeological work required,
    ii. the role, responsibility and level of authority of the approved archaeologist
    iii. areas and works where the approved archaeologist must be present,
    iv. requirements for stand down periods to enable archaeological work.
    v. procedures for any archaeological investigation or recording of archaeological information.
    vi. timeframes for archaeological work
    vii. mechanisms for dispute resolution, and
    viii. emergency contact details for approved archaeologist, Heritage New Zealand Pouhere Taonga Archaeologist and Tangata Whenua.
e. The Management Plan must be submitted to the Heritage New Zealand Pouhere Taonga Archaeologist for approval prior to the commencement of any earthworks. No earthworks shall commence until Heritage New Zealand Pouhere Taonga has given its written approval of the Plan.

Recommendations regarding ongoing site management

12. Establishing a heritage panel for long term site management: In terms of the subdivision and heritage stewardship the installation of a heritage interpretation panel detailing and interpreting what remains and how to care for it will help empower community care and stewardship into the future. Outside of the residential and roading components of the subdivision but within Lot 40, 30 & 51 there is a significant array of identified remnants. As land parcels 40 & 51 have recorded and unrecorded archaeological sites and feature and 30 as proposed recreation reserve with recorded archaeological water races, they are protected under the HNZ Act 2014 and need to be managed so their features and values are preserved. Any earth disturbance needs to be informed by the archaeological plans within this assessment. Spatial data is available. Reference is drawn to the principles and practices of the NZ ICOMOS Charter where proposals involve remediation, replication or removal of structures or archaeological sites. Refer appendices – supporting materials.

Conclusions

This project is an example of best practise for identifying heritage and landscape values first up and then with informed considered design between Landpro survey and subdivision planning; Rough & Milne Landscape architects; Kopuwai Archaeology and Sauders & Co, Town Planning Group, RMA advice and project coordination, in collaboration with clients Jones Searell Family Trust.

This most recent proposal has been positive and seen the latter extent of the upper twin water race F41/369 retained in proposed recreation reserve Lot 30 (now subject to landscape mitigation screen planting which while physically retaining the upper twin water race will obscure it from functional legibility and connectivity to the wider heritage values), where previously it was subject to destruction and the other heritage landscape features previously largely preserved in Lot 200 now contained in Lot 40 with the remnants Pennyweights sluiced working F41/368 within Lot 51 and the remaining Revells basin mining features and historic Bannockburn town street dwellings and stables sites in Lot 50 outside of the current subdivision proposal

A key change with this 20-lot subdivision is the majority of the heritage values are now confined within three largely peripheral, non-residential lots being Lots 30, 40, 50 and 51 which largely avoids dissection and truncation, retaining more intact heritage features and heritage landscapes for better preservation, legibility, appreciation and consistency of management into the future.

There has been a high level of design and significant investment in identifying remaining heritage values and incorporating them into the Water Race Hill subdivision and respecting the wider Jones Searell Family Trust property potential. These heritage values with the significant landscape attributes have been considered and sensitively designed into the subdivision.

The sites archaeological pre-1900's features involve various gold working sequences; sluice gulches; stacked tailings, sluice channels; main supply water races and branch distribution races; dams; likely farmstead, town commonage fencing and stabling. Informed by the historic heritage assessment the proposed subdivision design has worked to avoid and preserve all of the gold working sequences; sluice gulches; stacked tailings and sluice channels.

Integrating the proposed subdivision design has involved the proposed loss of some 37% of historic fencing and the proposed retaining of most of two of the three main races, with only the southern portion of the upper of the twin water races being proposed for destruction to accommodate subdivision roading and residential lots and the lower twin race being proposed for adaptive reuse as subdivision footpath.

Using the Significance of Effects Matrix, the site qualifies as being an undesignated historic landscape that would justify special historic landscape designation, a landscape of regional value; with averagely well-preserved historic landscape with reasonable coherence, time-depth, and rich and diverse array of historic industries. The heritage landscape has high context to the main street, nearby heritage landscapes, (private & public) along the historic Kawarau River terrace sequences, in particular the Landmark Bannockburn Sluicing's Historic Reserve. The prominent landforms of Slaughteryard Hill and Water Race Hill off Terrace Road between Shepherd's and Revell's Gorges have their own significant contribution to the wider landscape and past cultural history.

The setting from a wide view is experienced and appreciated by locals and the wider community and while some disturbance and modification has occurred in portions, the whole is an appreciated asset.

The assessment of significance in archaeological terms has been described above under the archaeological values section and in summary the collective of components of this heritage landscape reflects representative aspects of NZ history. Having potential to provide knowledge of NZ history, for the public and community to have esteem for the place with potential for public education on these remaining cultural features from early settlement and industry. The place forms and contributes to a wider historic and cultural area.

The assessment of effects in RMA heritage in terms of magnitude of effects is challenging when a new multi-dimensional layer/s in terms of residential subdivision is introduced into the heritage landscape. While sections of individual historic features and heritage system components can be retained and protected, their legibility, context and interpretation can become diluted and incoherent.

So, with the individually effected heritage elements of water races and fences, the losses to heritage water race and fence components can be deemed minor in physical lineal terms and in archaeological contribution, what remains of the water race and fence features post subdivision now need meaningful interpretation to explain the dislocated remains and their function in the wider heritage system and landscape.

In terms of the subdivision mitigation for minor effects on identified elements and matrix assessed effect of a slight to moderate impact on heritage landscape it is key to foster heritage understanding of the heritage landscape and its elements. This is to promote stewardship via the installation of a heritage panel detailing and interpreting what remains of their association to the wider heritage landscape and its system features and how to care for it will help empower community care and stewardship into the future.

Management

To protect and capitalise the identified heritage valves for preservation and integration into the subdivision a heritage management plan as recommended above must be integrated into the subdivision construction and residential development phases so the values come through the construction phase and remain to distinguish this subdivision and are not accidentally or inadvertently damaged or destroyed.

The high degree of recognition from all parties that the Water Race Hill has and is something unique and different by way of its combined values of heritage, topography and setting between Bannockburn settlement and Bannockburn Inlet, and Shepherd's Creek. This has endeared all to focus and make the most out of the combined attributes and challenges of this site and project.

This has been a collaborative effort and journey to this point, and I professionally feel this is a well-considered and thought-out design recognising and working with the respective community heritage, landscape and amenity values of Water Race Hill.

References

- NZ Archaeological Association site records data.
- Archaeology, M. S.-K. (2018). Archaeological assessment for Lake Dunstan Trail – Clyde to Cromwell via Bannockburn on south side Lake Dunstan for Central Otago Queenstown Trail Network Trust 2018.
- Crump, P. (2021). The Bannockburn History Project. http://oldbannockburn.nz.
- John, P. (1976). Coal Mining in Bannockburn.
- Land Information New Zealand. (2021). data.linz.govt.nz - rural aerial photos.
- Local Government Geospatial Alliance (LGGA). (n.d.). Retrolens Historic Image Resource. Retrieved March 2021, from Sourced from http://retrolens.nz and licensed by LINZ CC-BY 3.0: https://retrolens.co.nz
- ltd, C. S. (n.d.). Quickmap - parcel & survey data & plans. (http://www.quickmap.co.nz).
- Murray, R. (n.d.). Ron Murray Historical Collection - Historic Images Bannockburn.
- Pole, M. (1993). Early Miocene flora of the Manuherikia Group, New Zealand.
- Stephenson, J. B. (2004). Bannockburn Heritage Landscape Study (2004). Department of Conservation.
- The Ngāi Tahu Cultural Mapping Project. (2021). Ngāi Tahu Atlas. Retrieved March 25, 2021, from Kā Huru Manu, The Ngāi Tahu Cultural Mapping Project:
- Aerial image of Lot 4 DP 339137. [Source: http://info.codc.govt.nz/maps].
- McCraw, J. (2000). Mountain water & River Gold. Square One Press.
- Parliamentary Commissioner for the Environment (1996)- Historic and Cultural Heritage Management Local Authority Good Practice Guide
- Design Manual for Roads and Bridges, Volume 11 Environmental Assessment, Section 3 Environmental, Topics Part 2 Ha 08/07 Cultural Heritage – Scotland
- Barr, C (2023) Town Planning Group (NZ) Limited. Application for Resource Consent to the Central Otago District Council: D. J. Jones and N. R. Searell Family Trusts, *Subdivision and land use resource consent, 88 Terrace Street, Bannockburn* 27 June 2023
- Milne, T (2023) Rough Milne Mitchell Landscape Architects Limited. Landscape Assessment Report for proposed subdivision Water Race Hill, RC2 01 REV C

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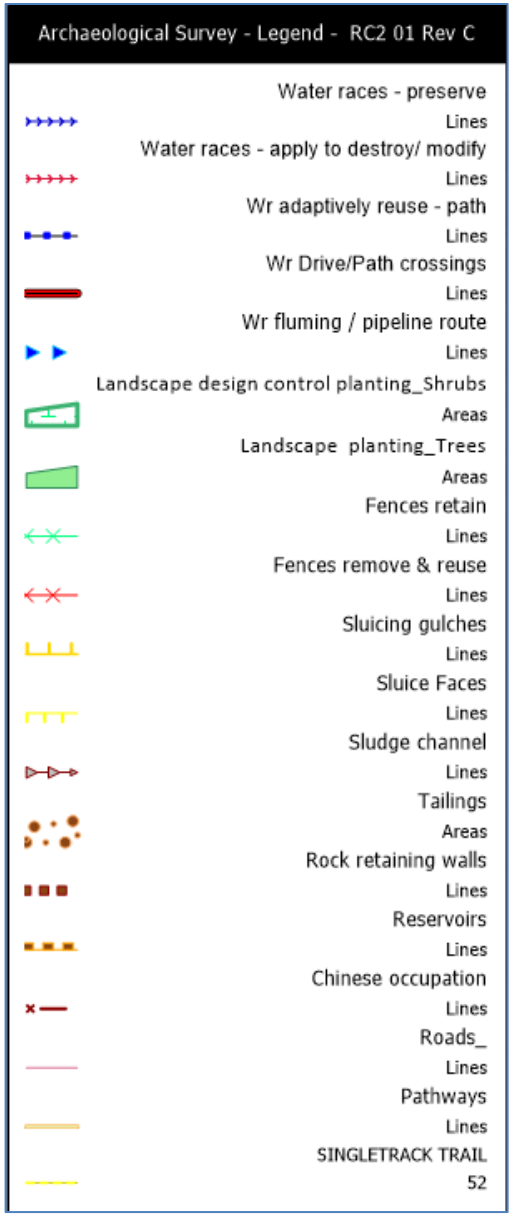


Figure 1 Plan legend

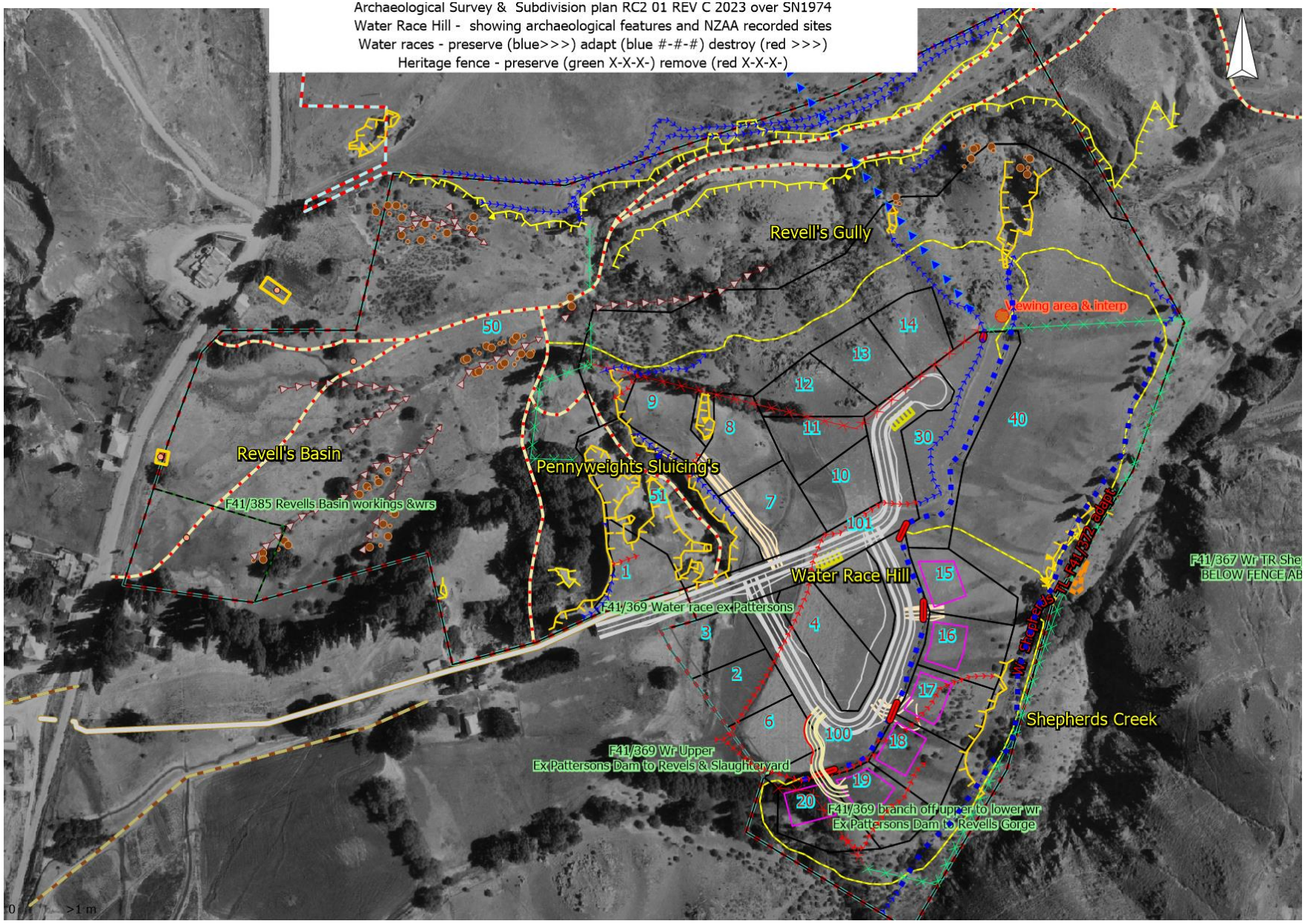


Figure 2 Spatial referenced plan of Water Race Hill subdivision RC2 01 REV C 2023 over 1974 Retrolens aerial SN 1974 with NZAA recorded site and surveyed archaeological features mapped that the subdivision has been designed within.

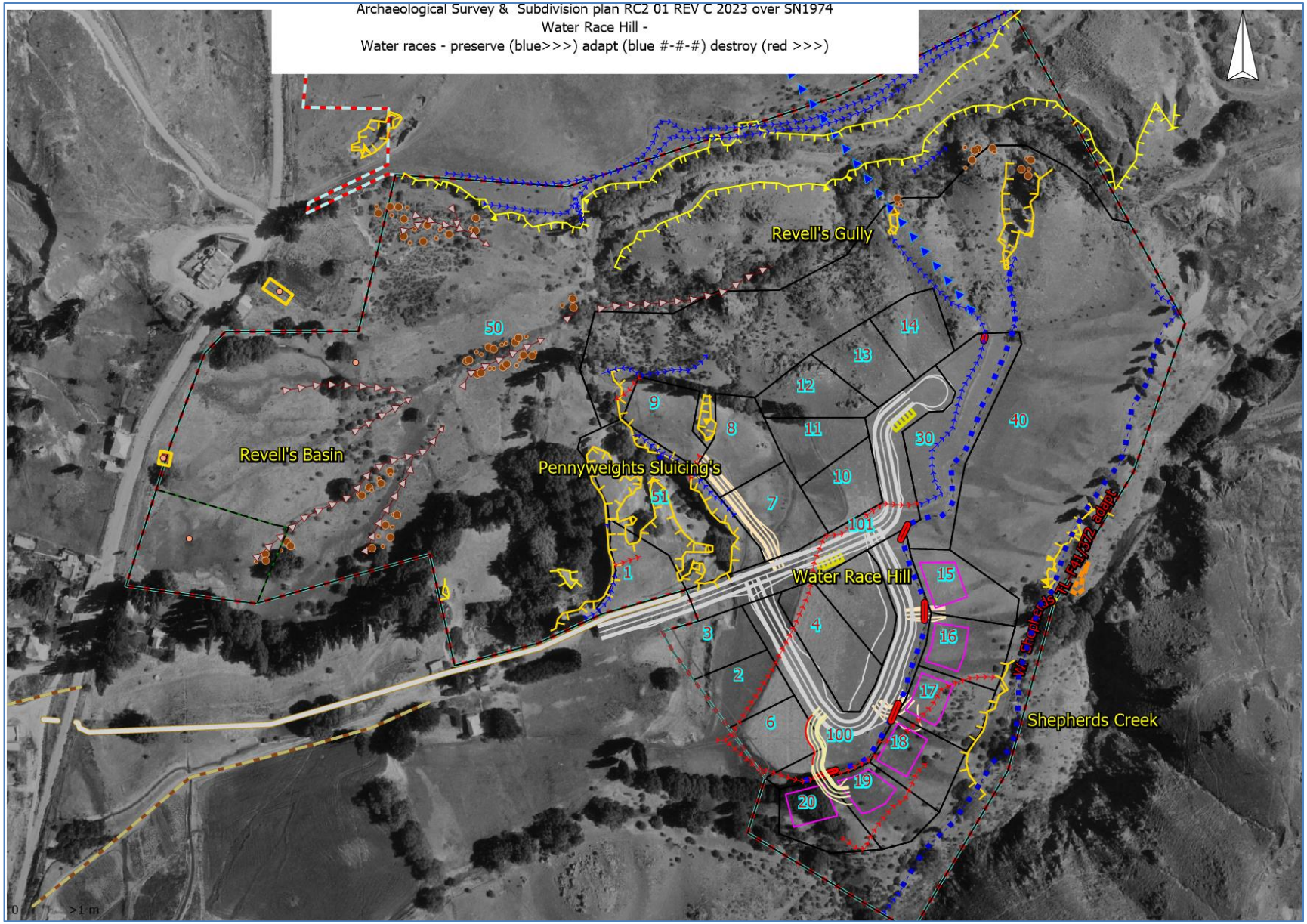


Figure 3 RC2 01 REV C 2023 over SN 1974 – Water Race Hill – Water races – preserve (blue >>>) - adapt (blue ■- ■- ■) – destroy (red >>>).

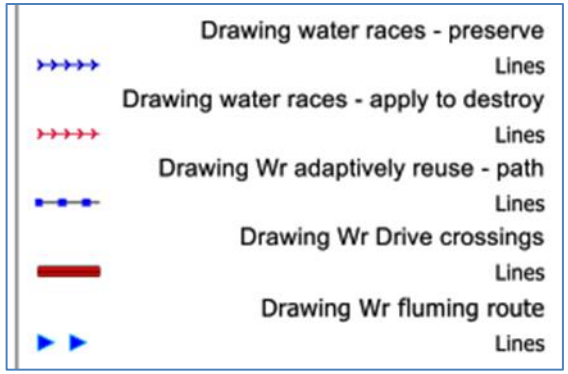


Figure 4 Legend for water races



Figure 5 Legend for Landscape design control plantings – shrubland areas & trees

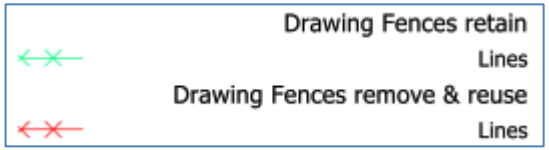


Figure 6 Legend for Lot 4 boundary fence line

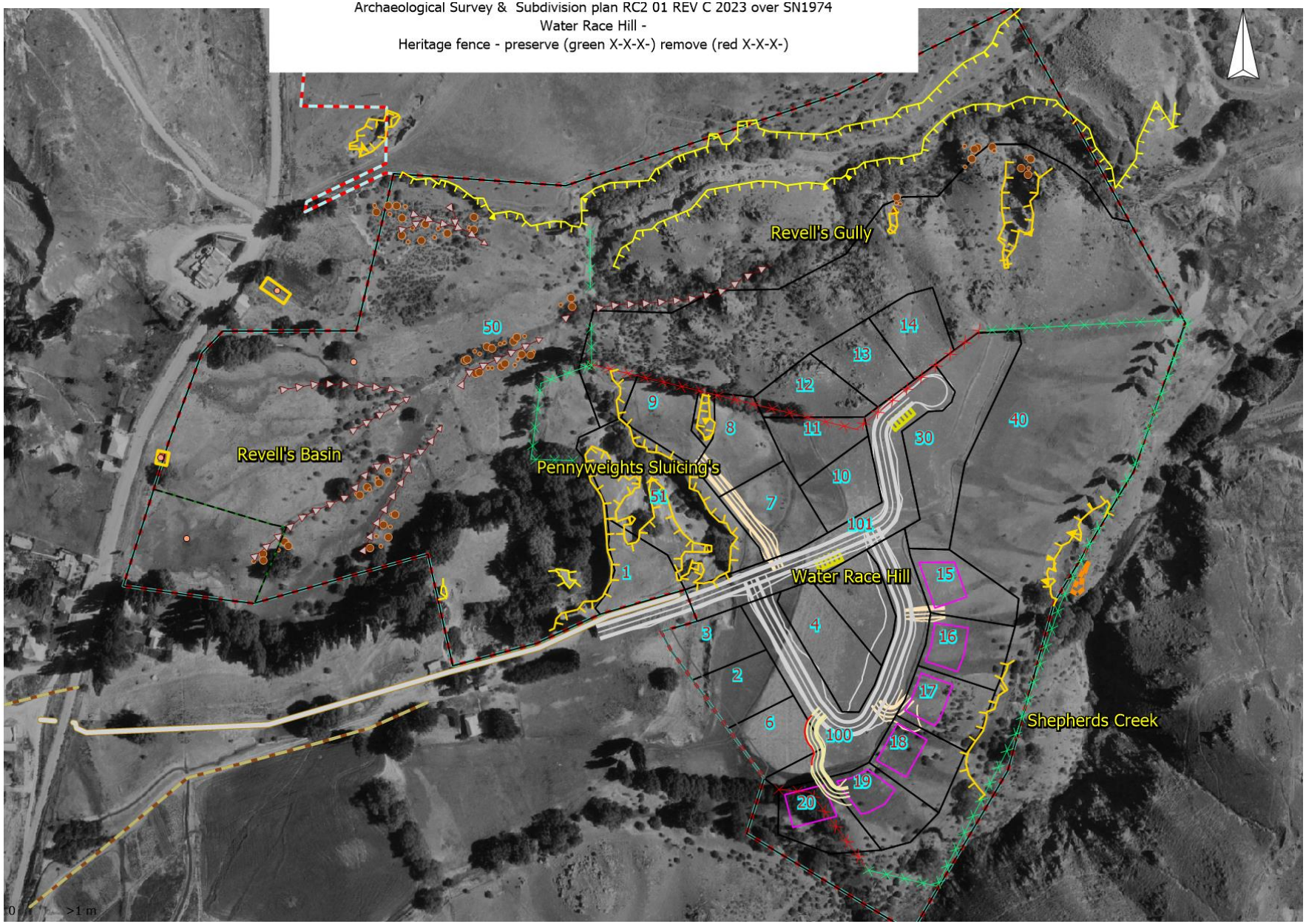


Figure 7 RC2 01 REV C 2023 over SN 1974 – Water Race Hill – Historic fences – retain (green) – remove & reuse (red).

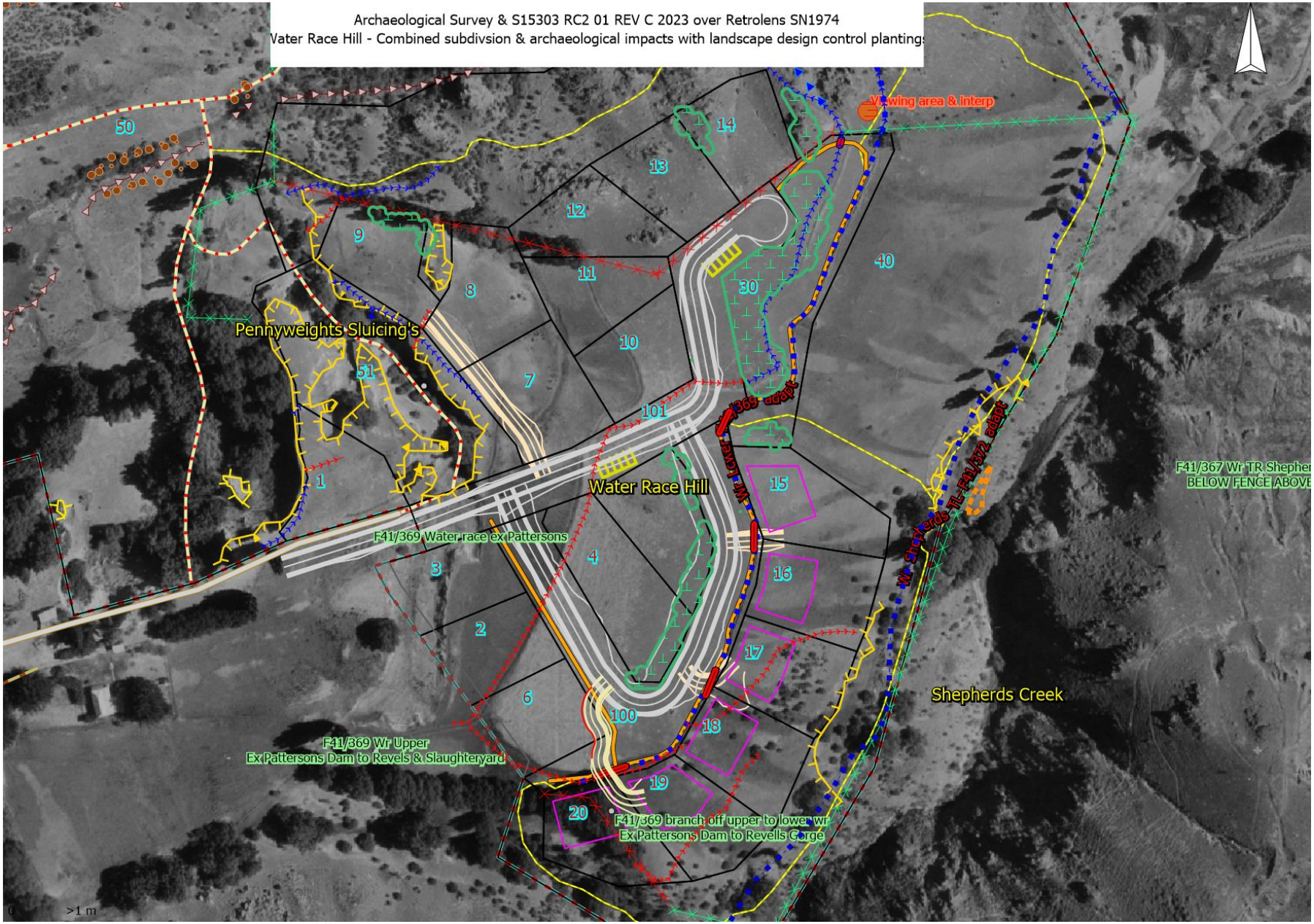


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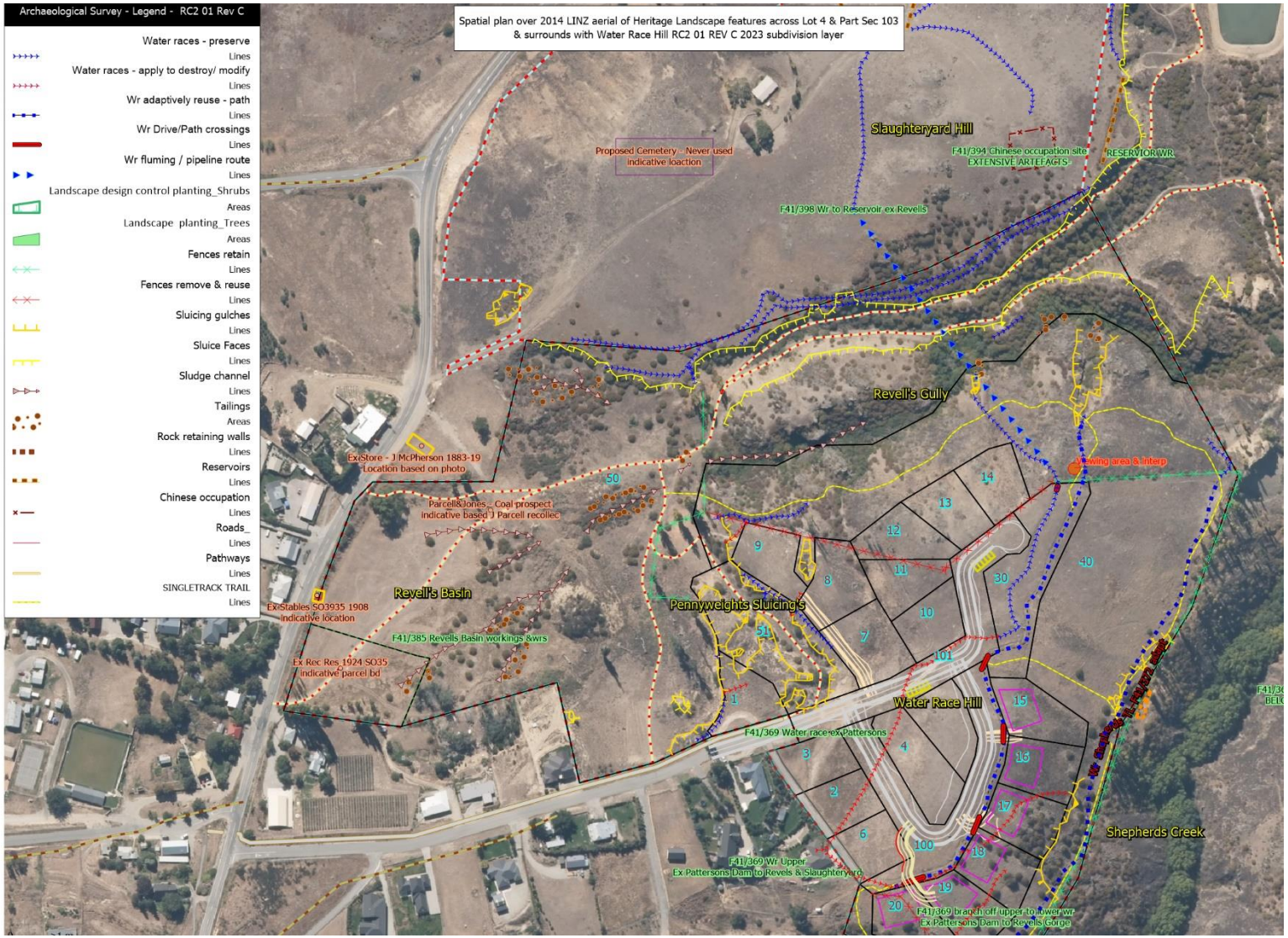


Figure 9 Spatial plan over 2014 LINZ aerial of Heritage Landscape features across Lot 4 & Part Sec 103 & surrounds with Water Race Hill RC2 01 REV C 2023 subdivision layer

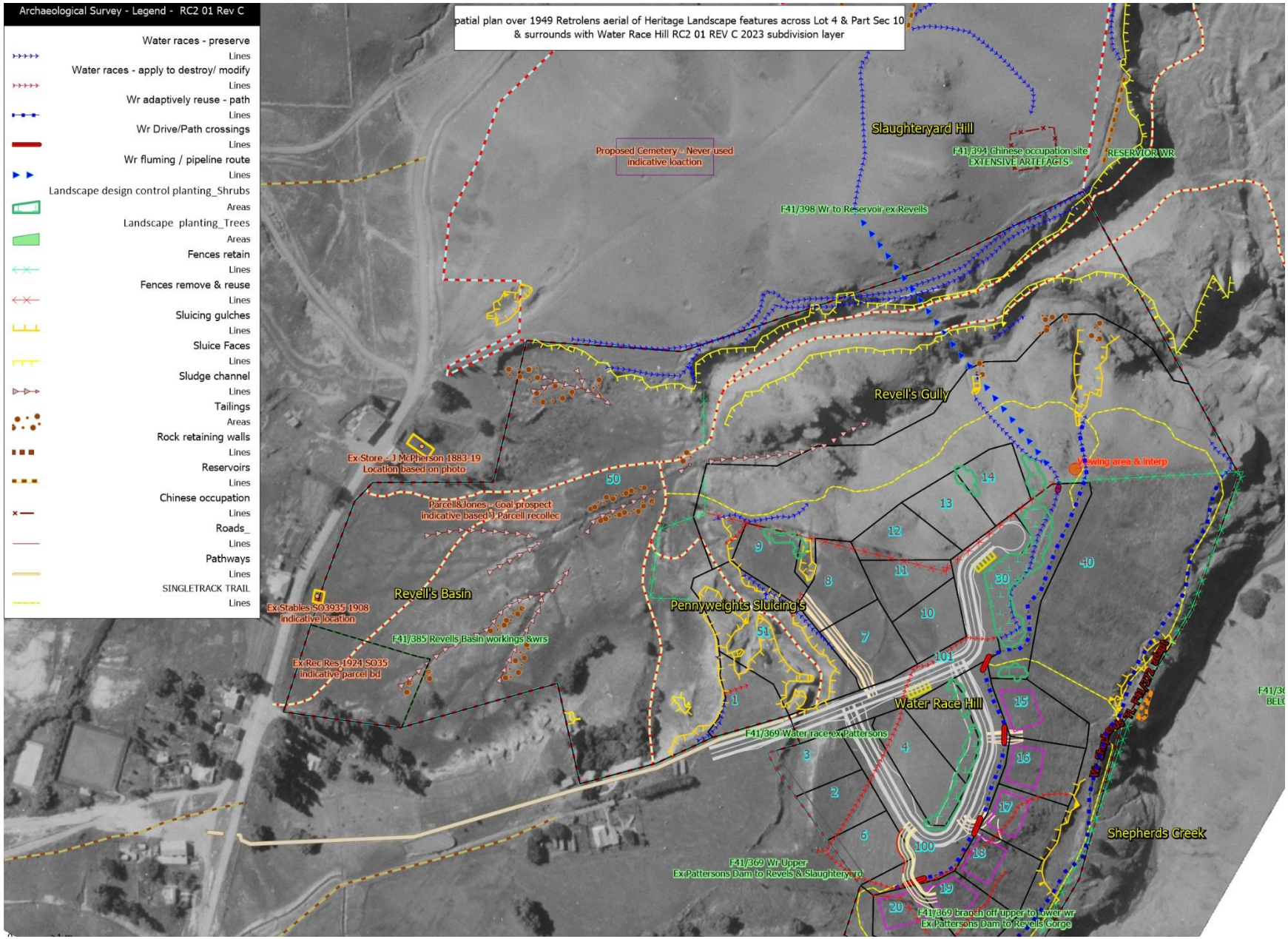


Figure 10 Spatial plan over 1949 Retrolens aerial of Heritage Landscape features over Lot 4 & Part Sec 103 & surrounds with Water Race Hill RC2 01 REV C 2023 subdivision layer

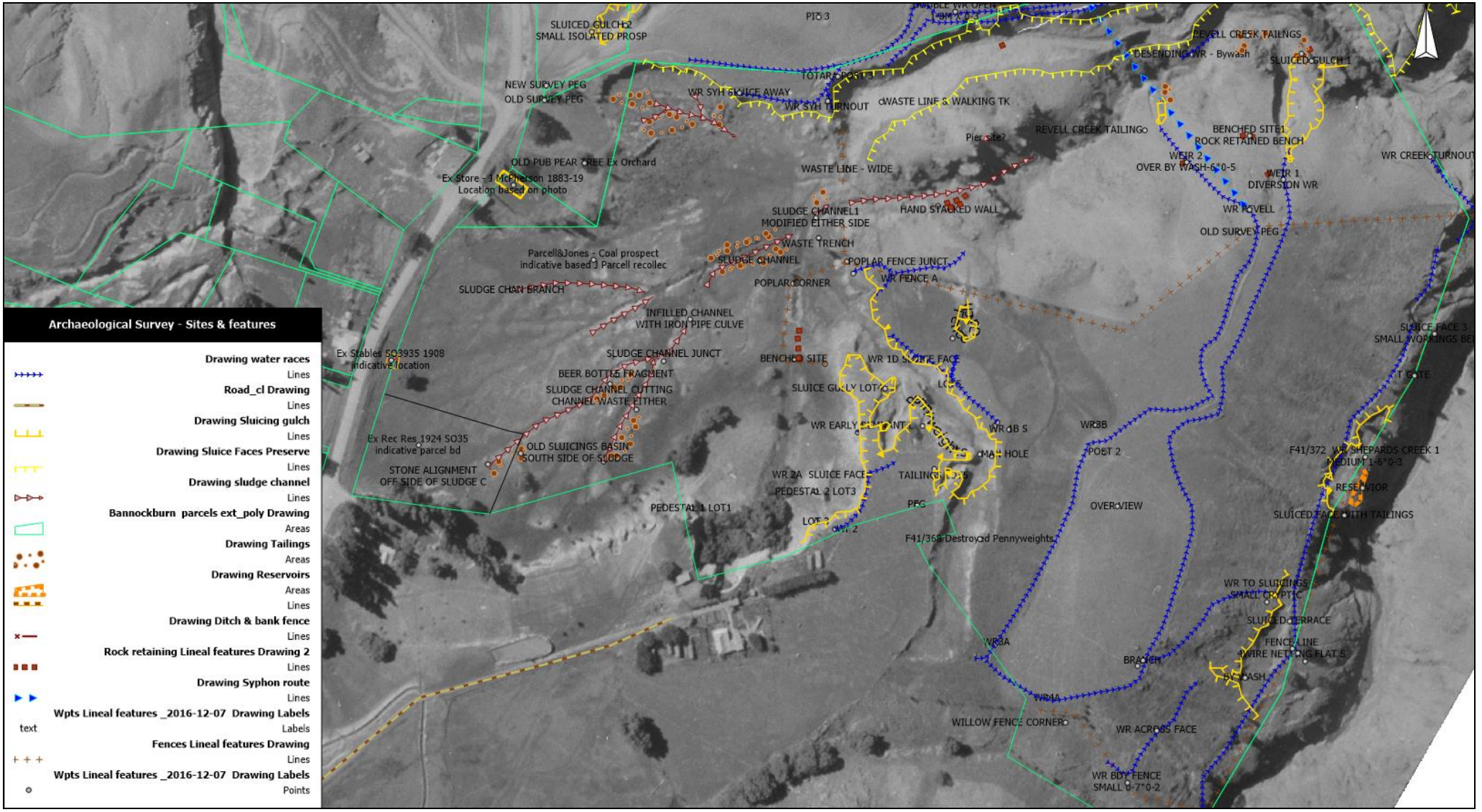


Figure 11 Map - Archaeological survey features & sites - Lot 4 over 1949 aerial – Kopuwai Consulting Aug 2017

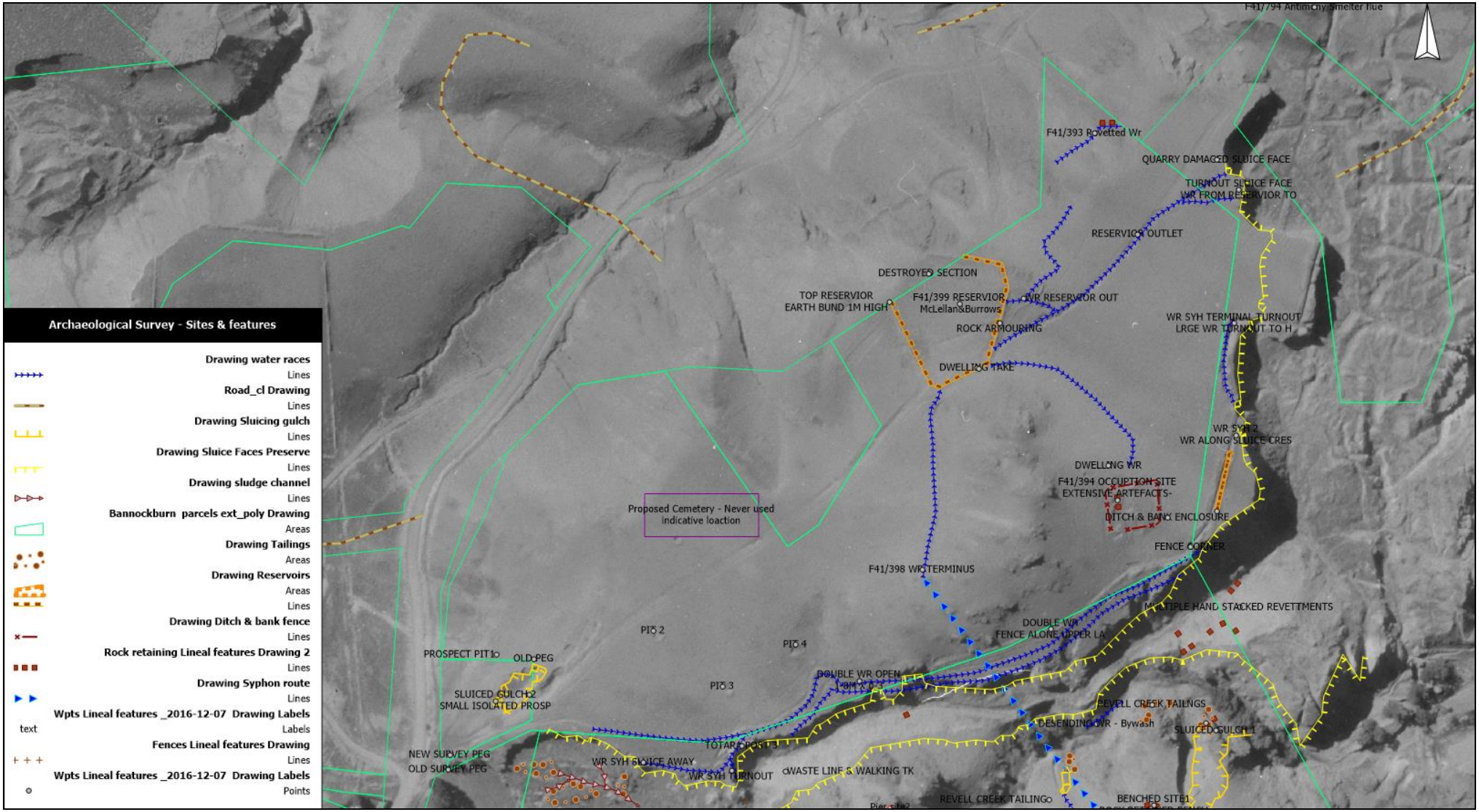


Figure 12 Map - Archaeological survey features sites - Slaughteryard Hill Pt Section 103- over 1949 aerial – Kopuwai Consulting Aug 2017

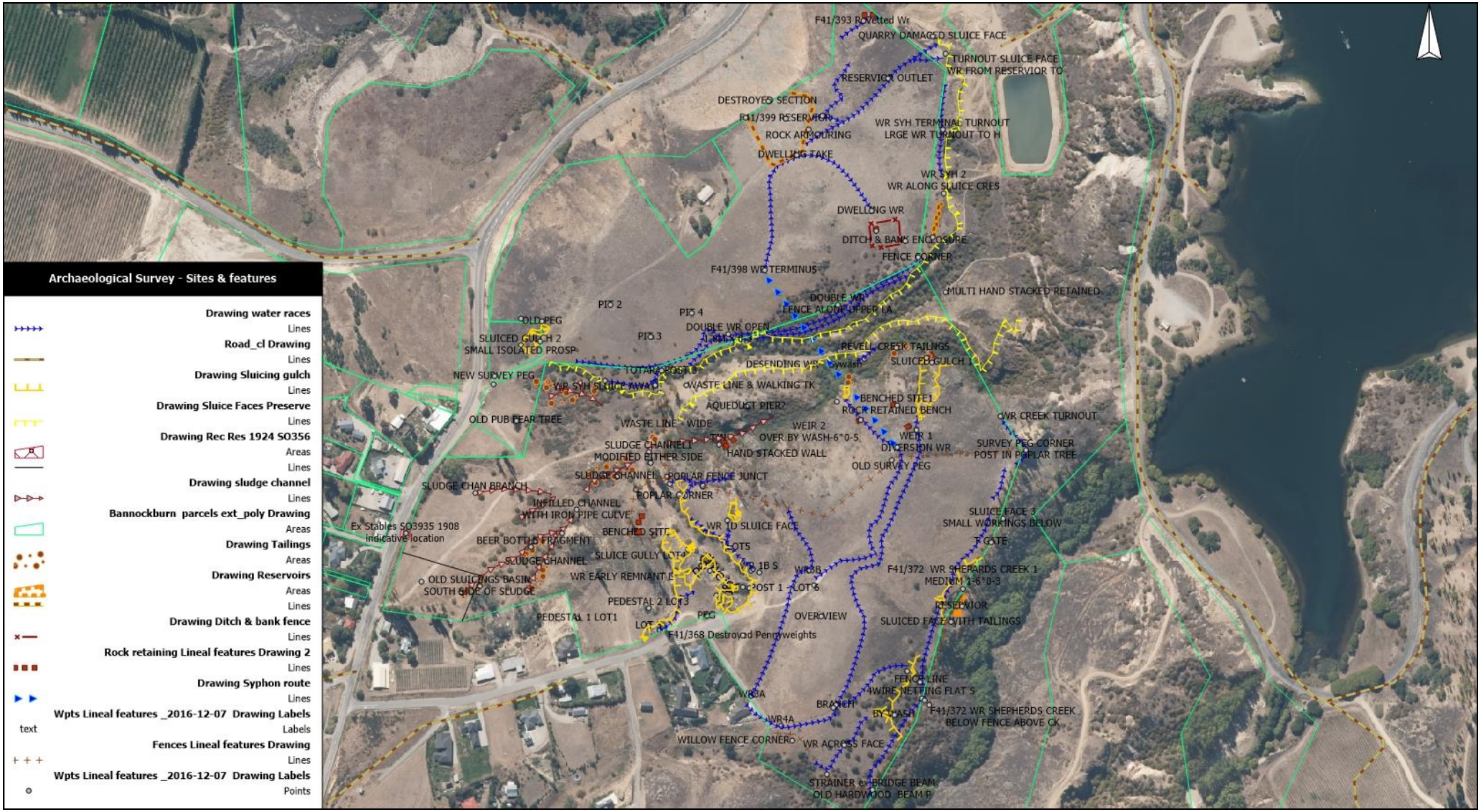


Figure 13 Map - Archaeological survey features sites –Water Race Hill Lot 4 & Slaughteryard Hill Pt Section 103- over LINZ 2014 aerial – Kopuwai Consulting Aug 2017

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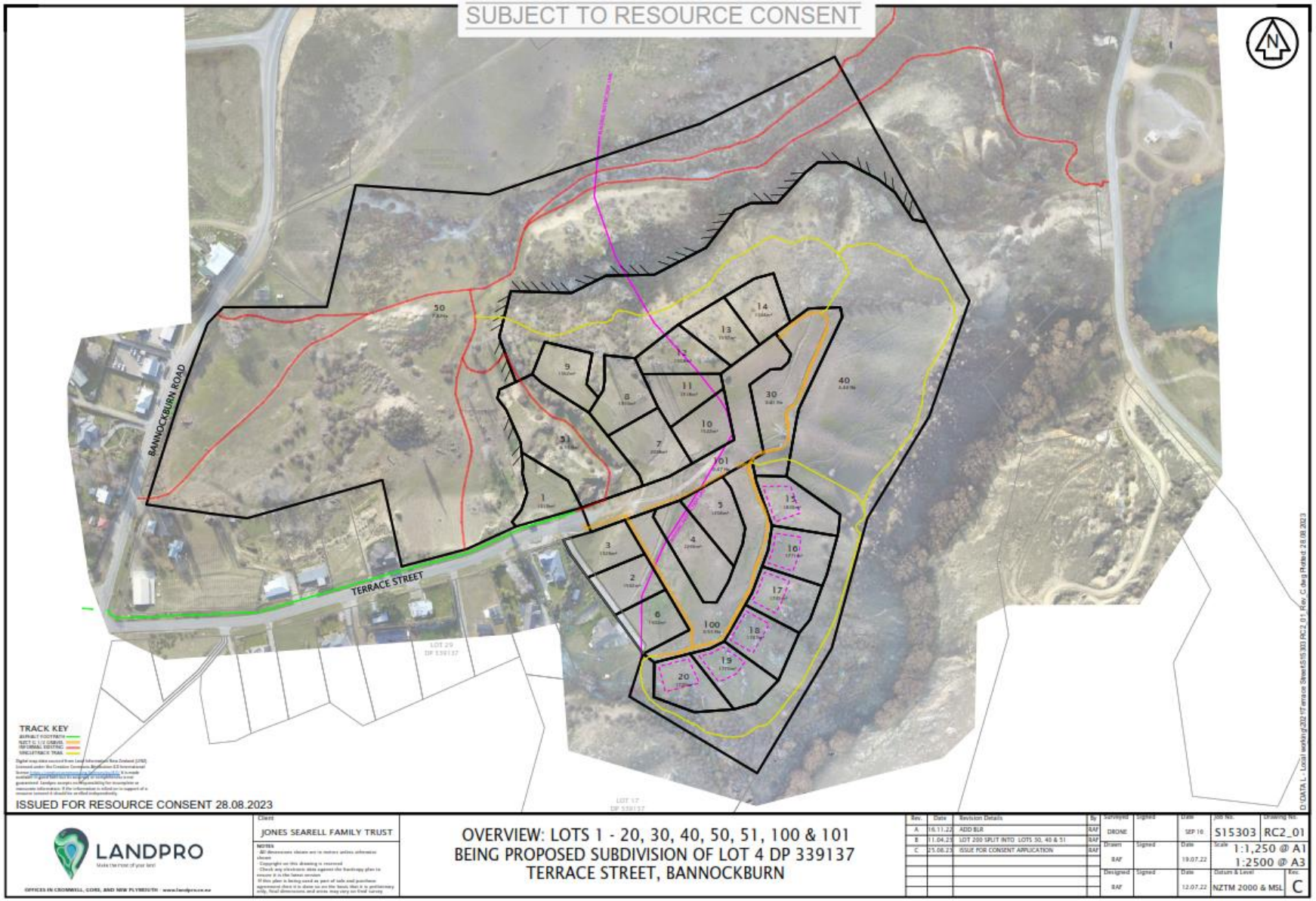


Figure 14 Landpro – RC2 01 REV C PROPOSED SUBDIVISION OF LOT 4 DP 339137 11 04 2023 TERRACE STREET, BANNOCKBURN

Proposed Subdivision Landscape Plan



Legend

- Rezoning Site
- Overall Property Boundary
- Building Line Restriction
- Residential Lot
- Building Platform
- Road Reserve
- Private Reserve
- Balance Lot
- Easement
- Road
- Proposed Paths
- Car Parking
- Proposed Mitigation Planting
- Street Trees Type 1
- Street Trees Type 2

Scale: 1:2,500 @ A3

RMM | Proposed Subdivision | Terrace Street, Bannockburn | 11

Figure 15 RMM proposed subdivision landscape design control planting plan

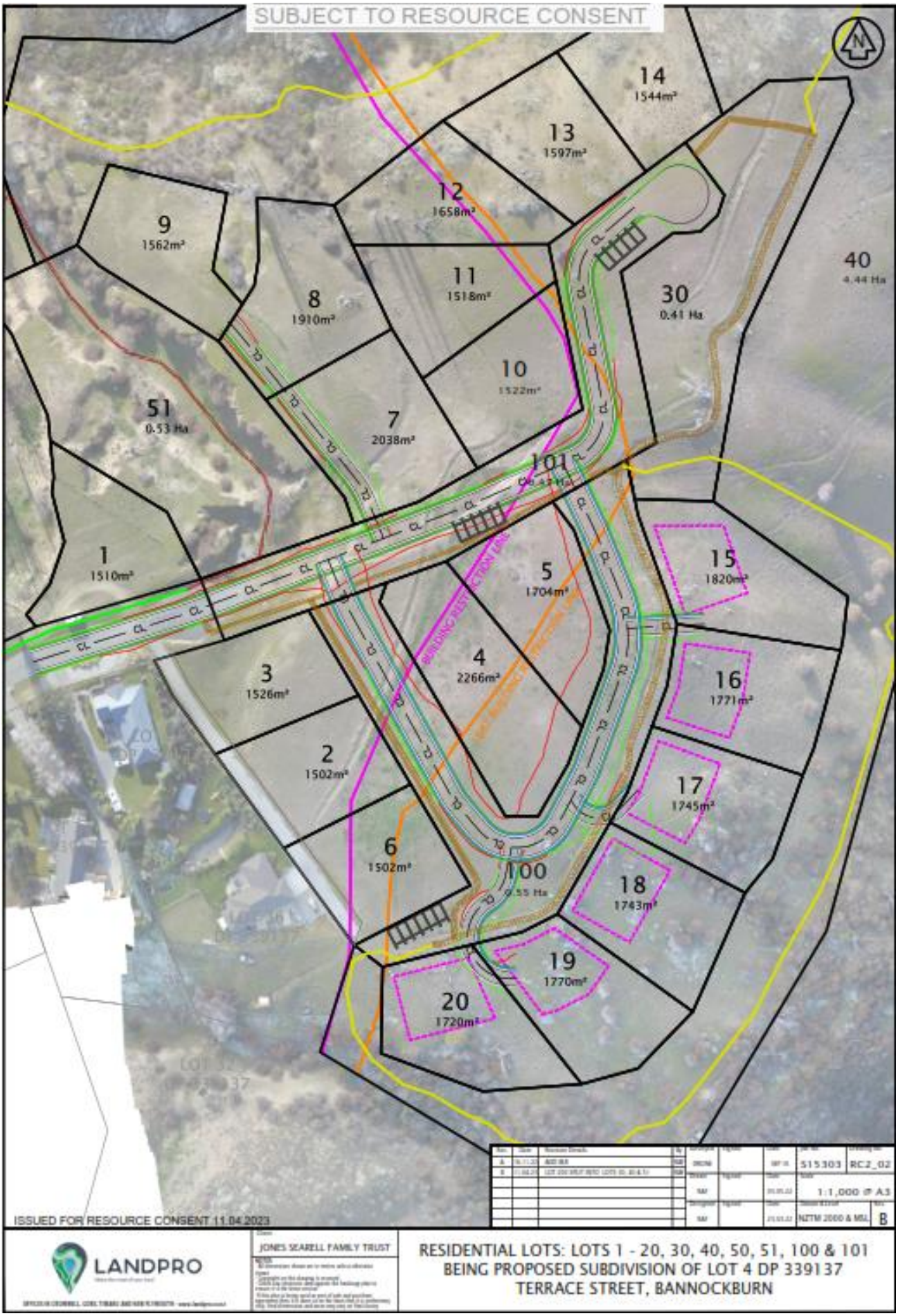


Figure 16 Landpro RC2 01 REV B Residential Lots 1-20, 30, 40, 50 , 51, 100 & 101 PROPOSED SUBDIVISION OF LOT 4 DP 33913711 04 2023 TERRACE STREET, BANNOCKBURN

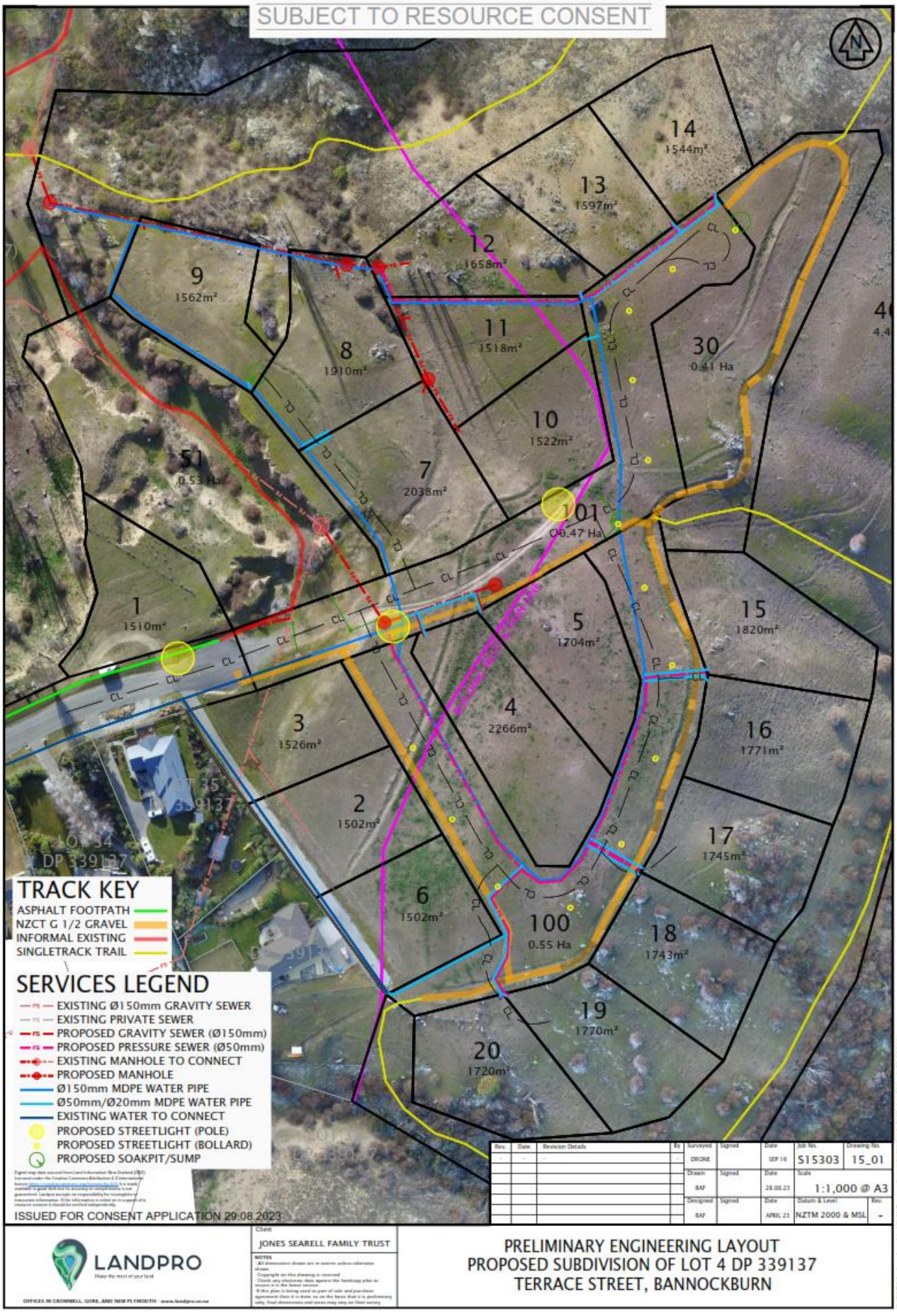


Figure 17 Landpro Preliminary engineering layout for consent application

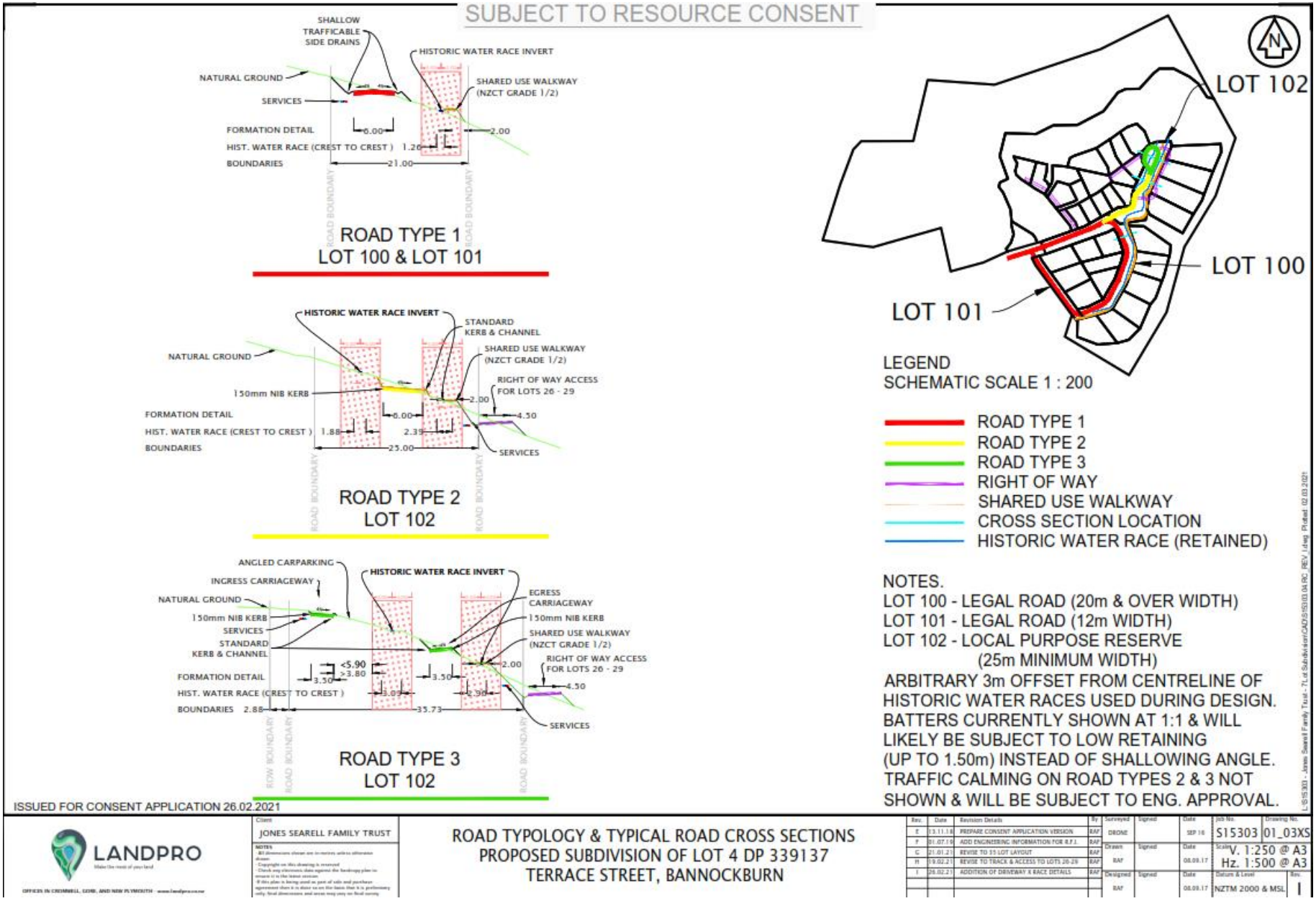


Figure 18 Landpro ROAD TYPOLOGY & TYPICAL ROAD CROSS SECTIONS PROPOSED SUBDIVISION OF LOT 4 DP 339137

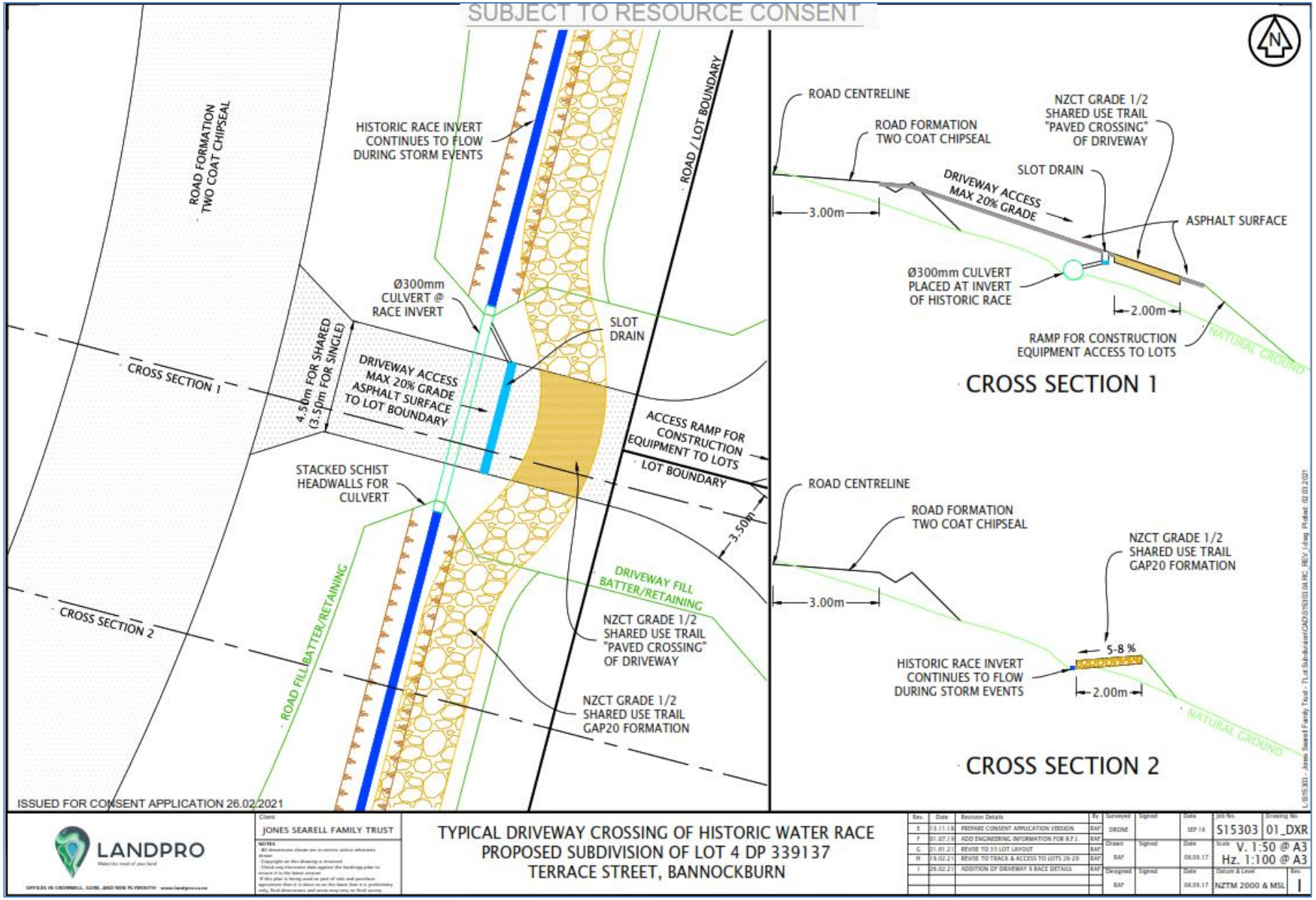


Figure 19 Landpro TYPICAL DRIVEWAY CROSSING TREATMENT OF HISTORIC WATER RACE 26 02 21 PROPOSED SUBDIVISION OF LOT 4 DP 339137

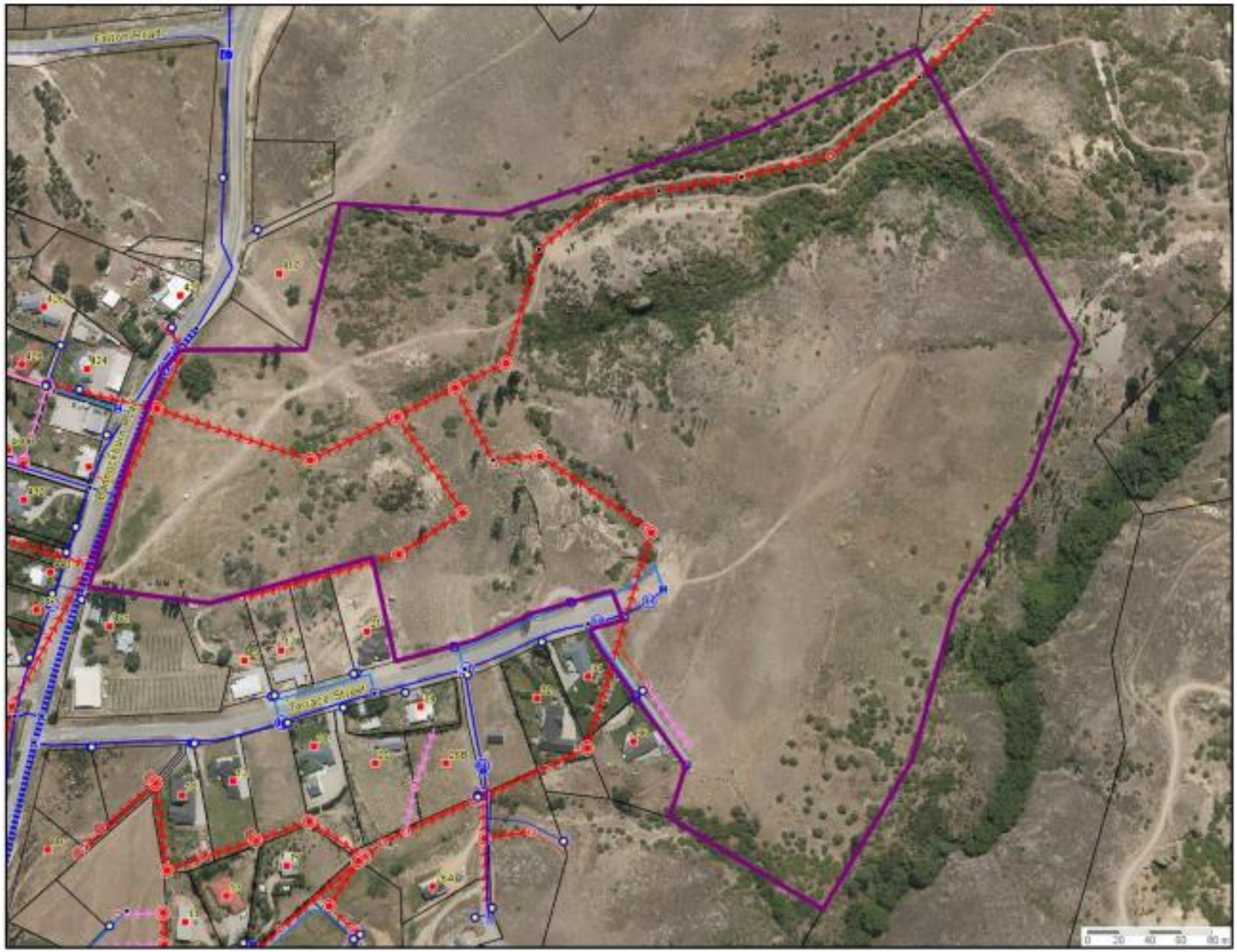


Figure 20 Aerial image of Lot 4 DP 339137 (purple outline). Sewer lines (red & pink) and water mains (blue) also shown. [Source: http://info.codc.govt.nz/maps].

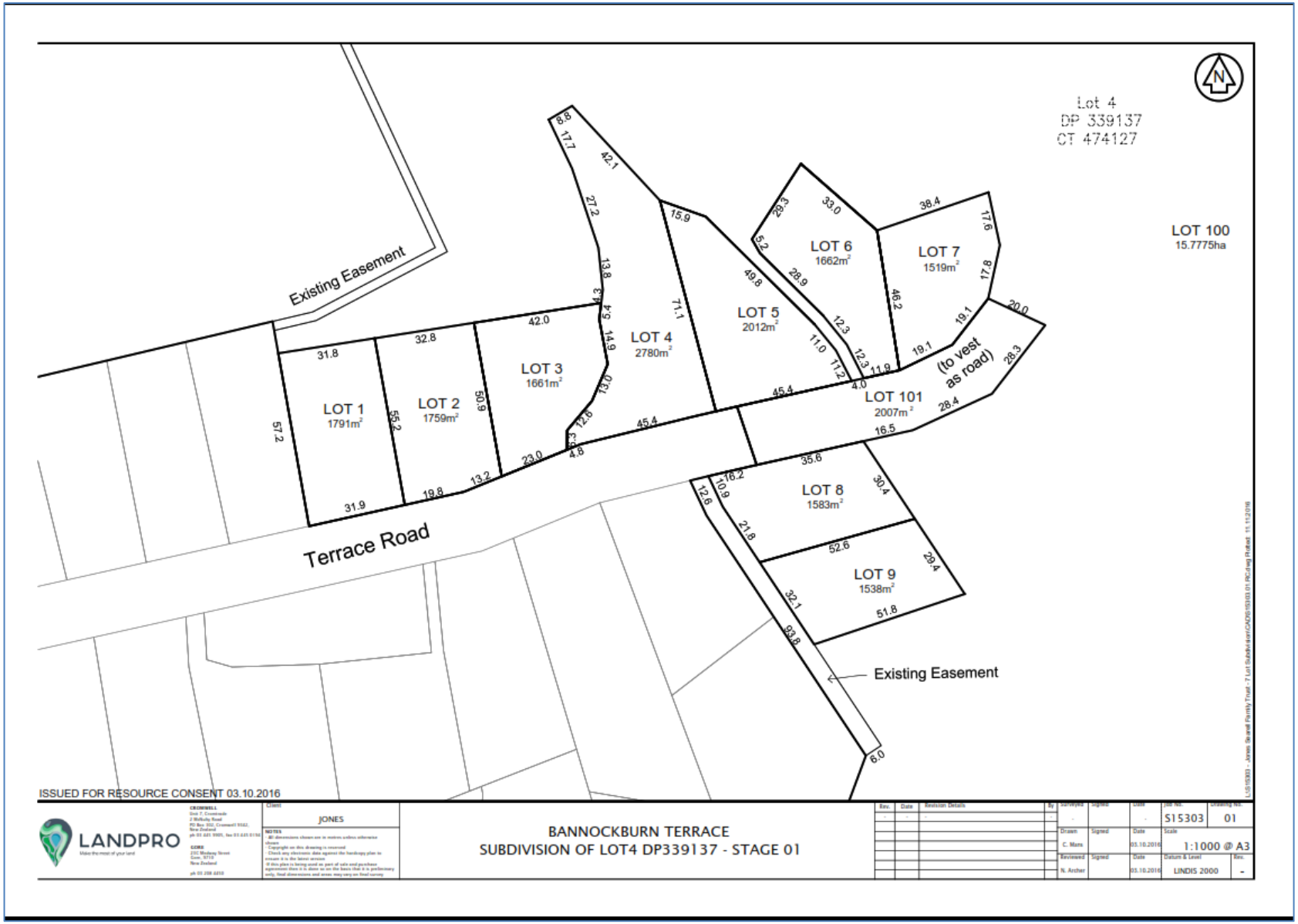


Figure 21 2016 Stage 1 S15303.01 RC 9 lot subdivision Lot 4 DP339137 – Initial Kopuwai survey project area

Plan of Recorded Archaeological sites

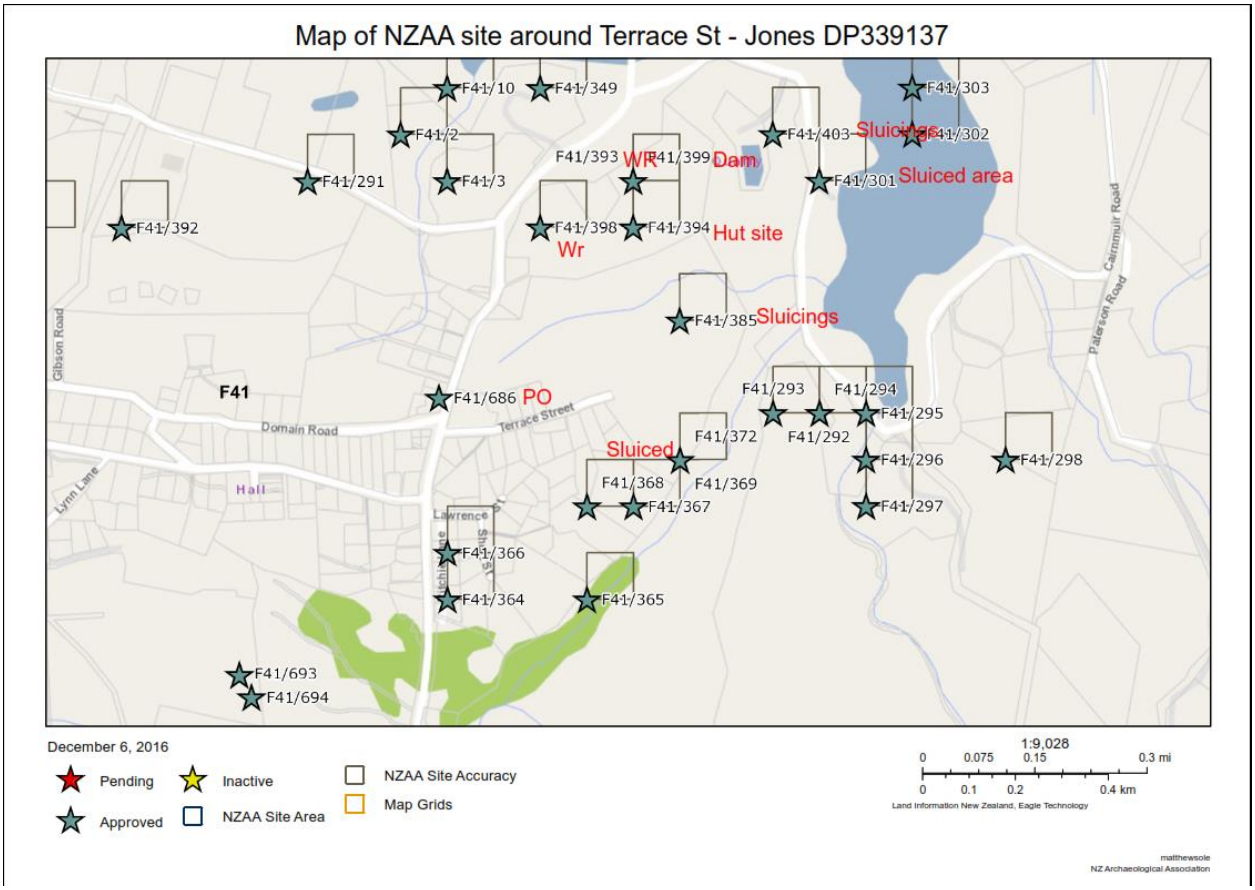


Figure 22 Map of NZAA wider view recorded sites on and around Terrace St – Lot 4 DP339137 Water Race Hill & Pt Section 103 Slaughteryard Hill, Dec 6 2016

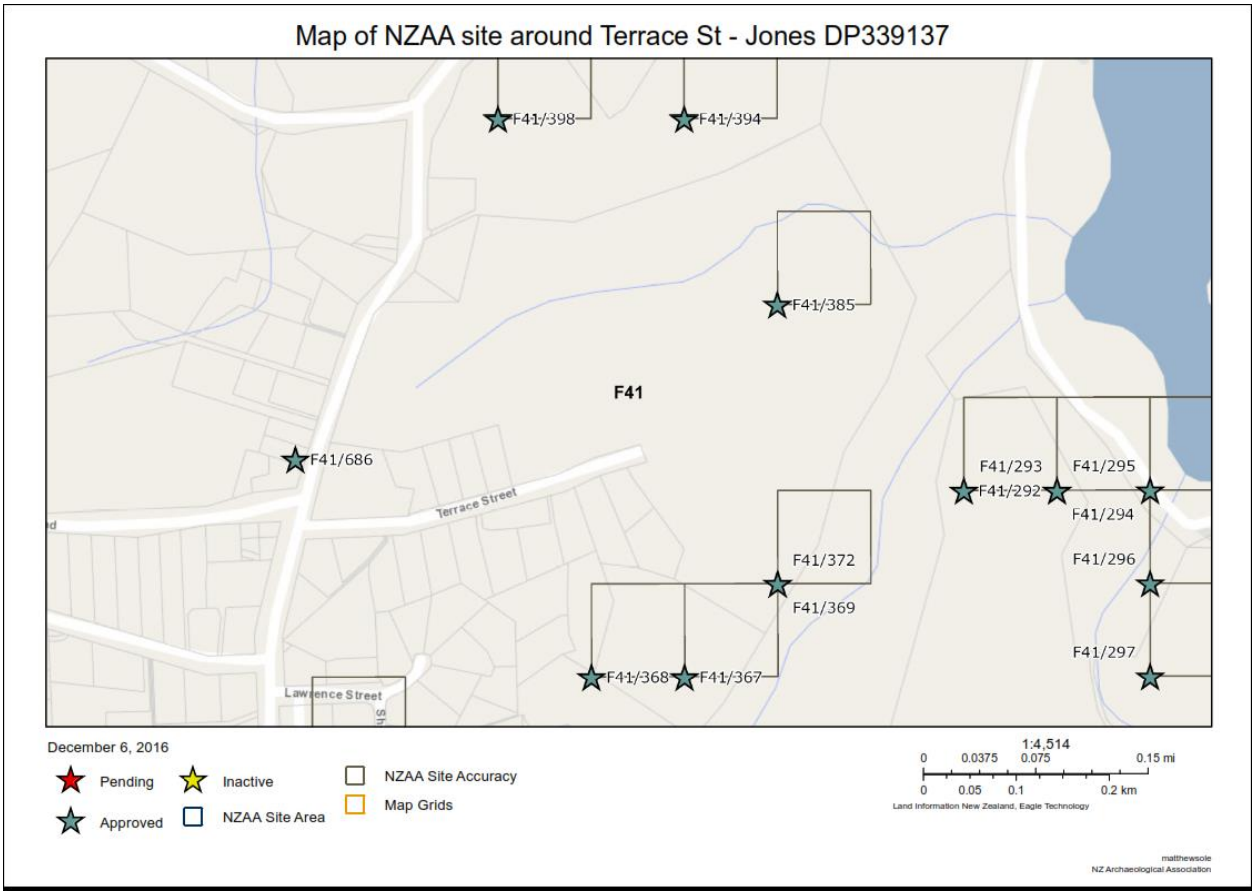


Figure 23 Map of NZAA (zoomed in) recorded sites on & around Terrace St – Lot 4 DP339137 Water Race Hill, Dec 6 2016

Old survey plans

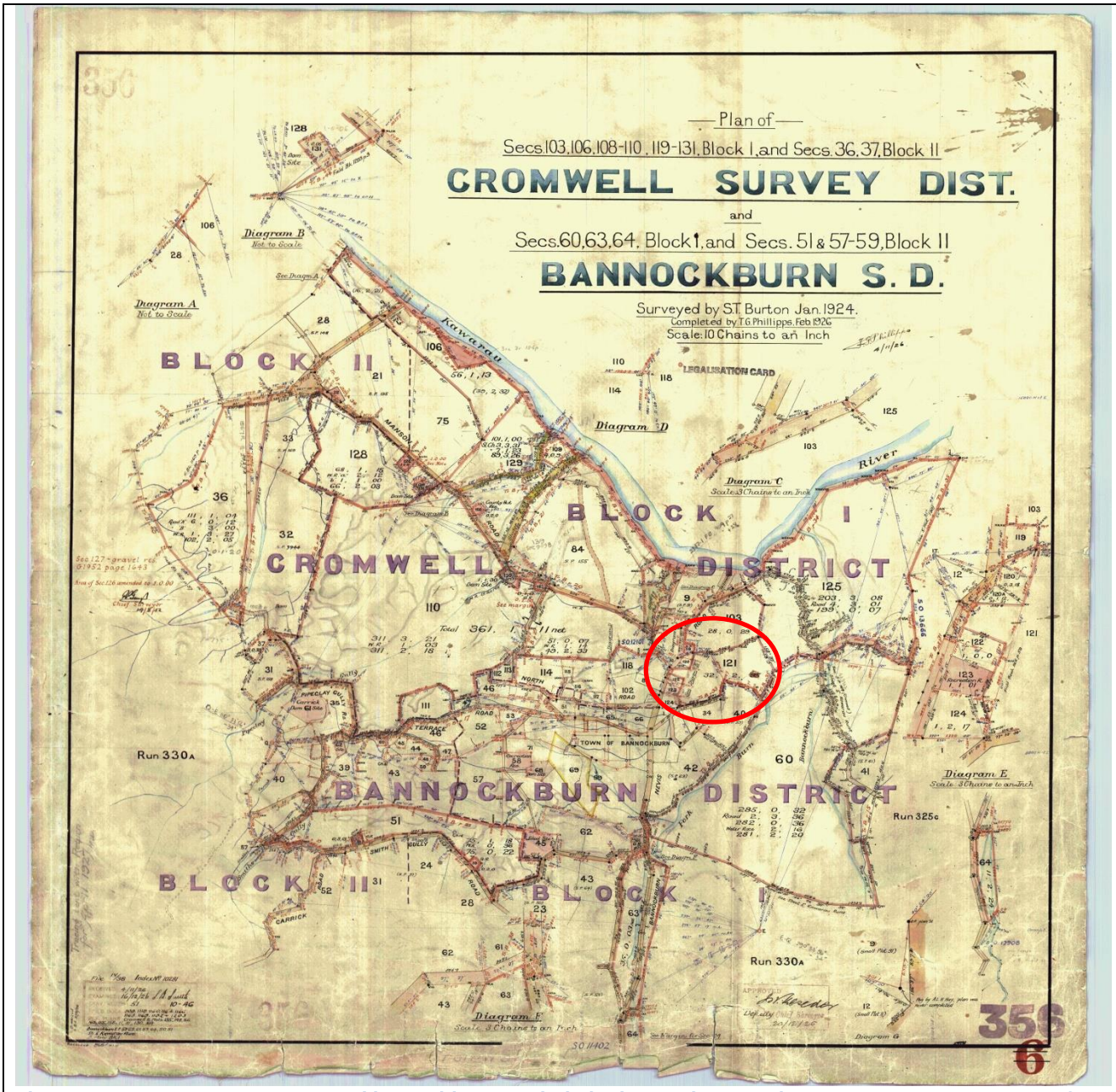


Figure 24 SO_356_Jan 1924 Bannockburn with Lot 4 circled - then various sections 121, 32 123, 122, & part of 40 – Source –Quickmap

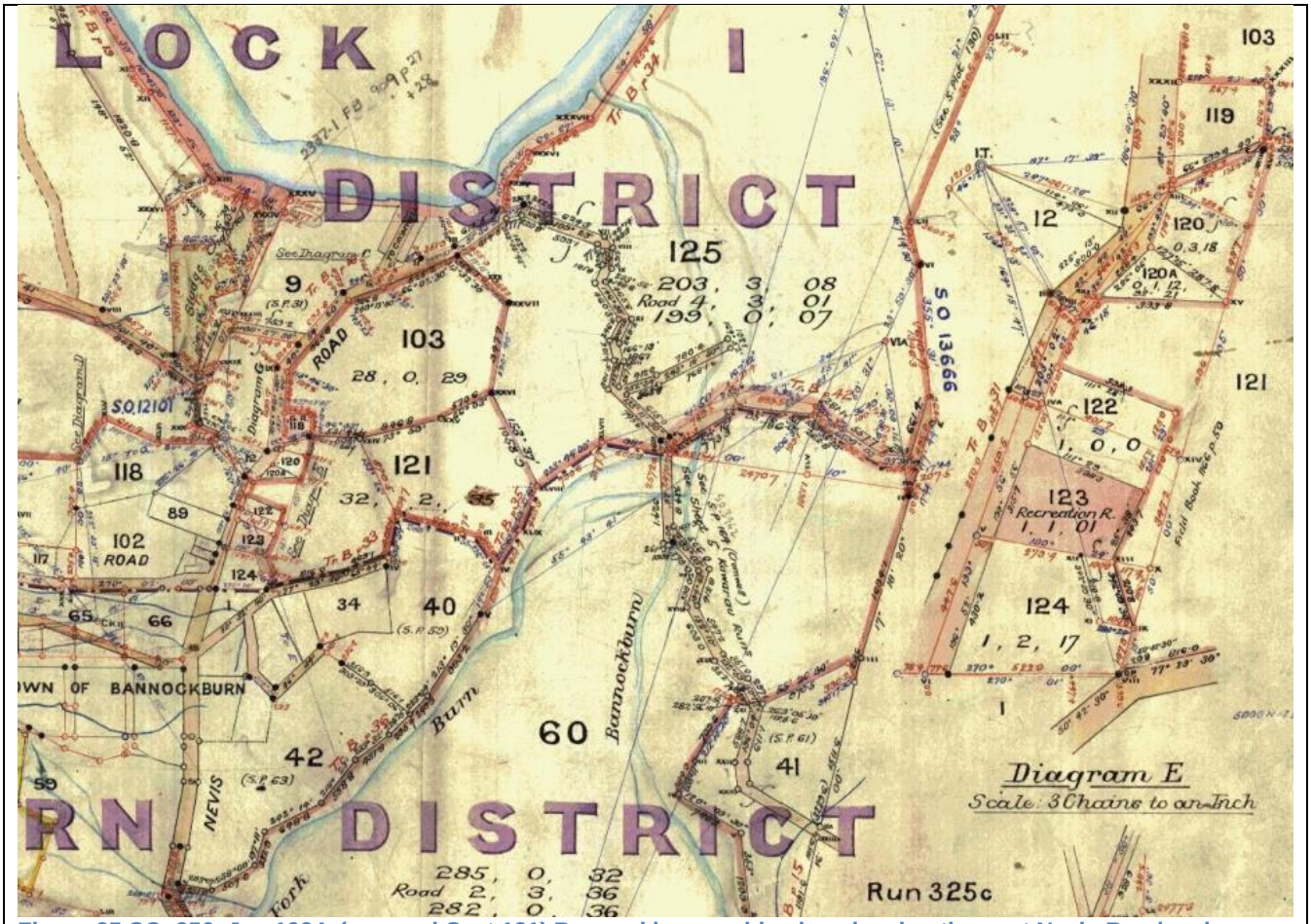


Figure 25 SO_356_Jan 1924 (cropped Sect 121) Bannockburn - wide plan showing the past Nevis Road main street property parcels 122, 123 (Recreation Reserve) now amalgamated into Lot 4



Figure 26 SO_14103_June 1910 Bannockburn Town Plan & Patterson's dam F41/366 supplying Pennyweights F41/368 & Revell's workings F41/825 & Gorge F41/795 – Source- Quickmap

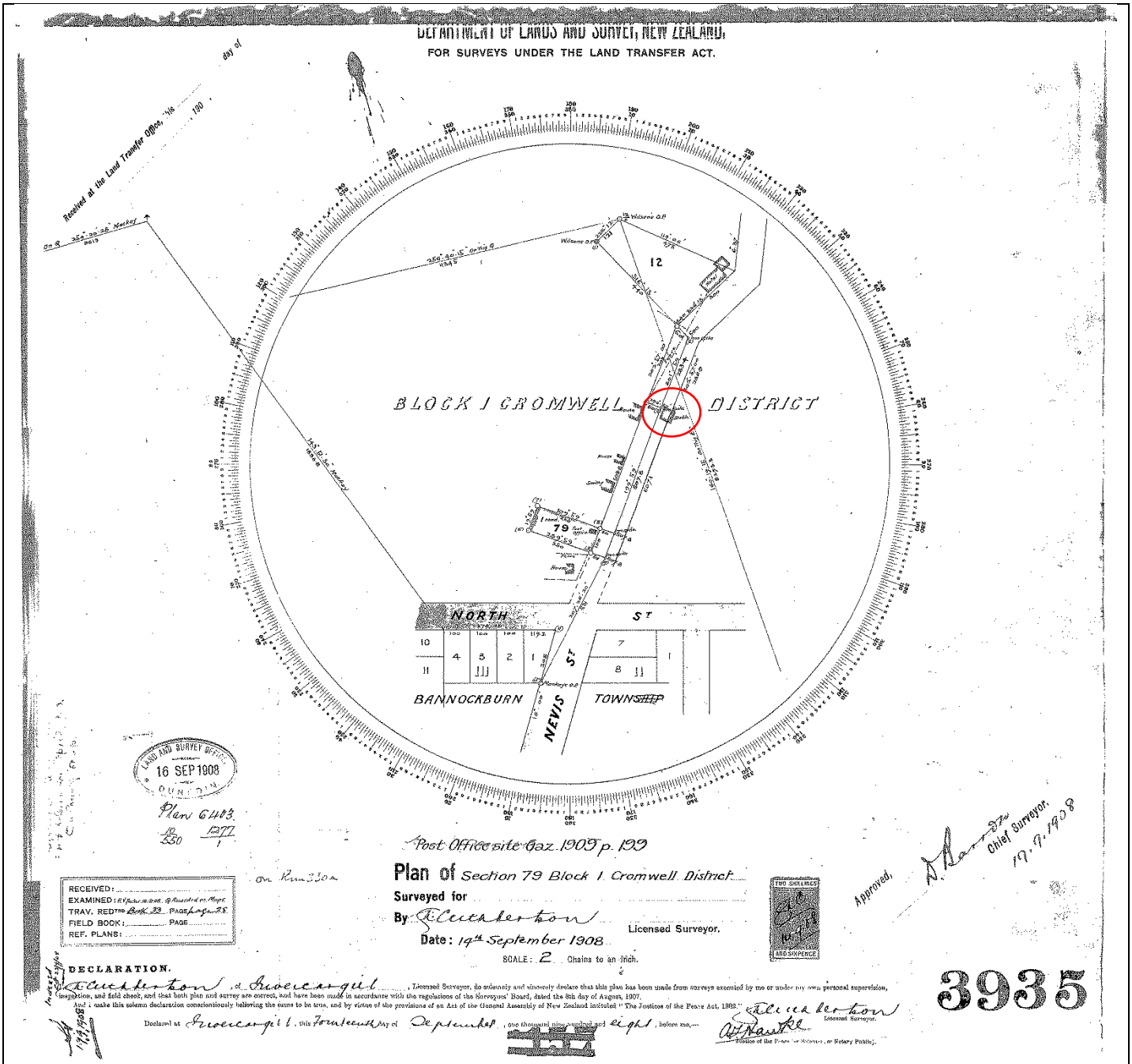


Figure 27 SO3935 1908 Nevis St buildings showing stables alleged to have been built in 1887 by James Lawrence when he shifted his bakery from Quartzville to Bannockburn

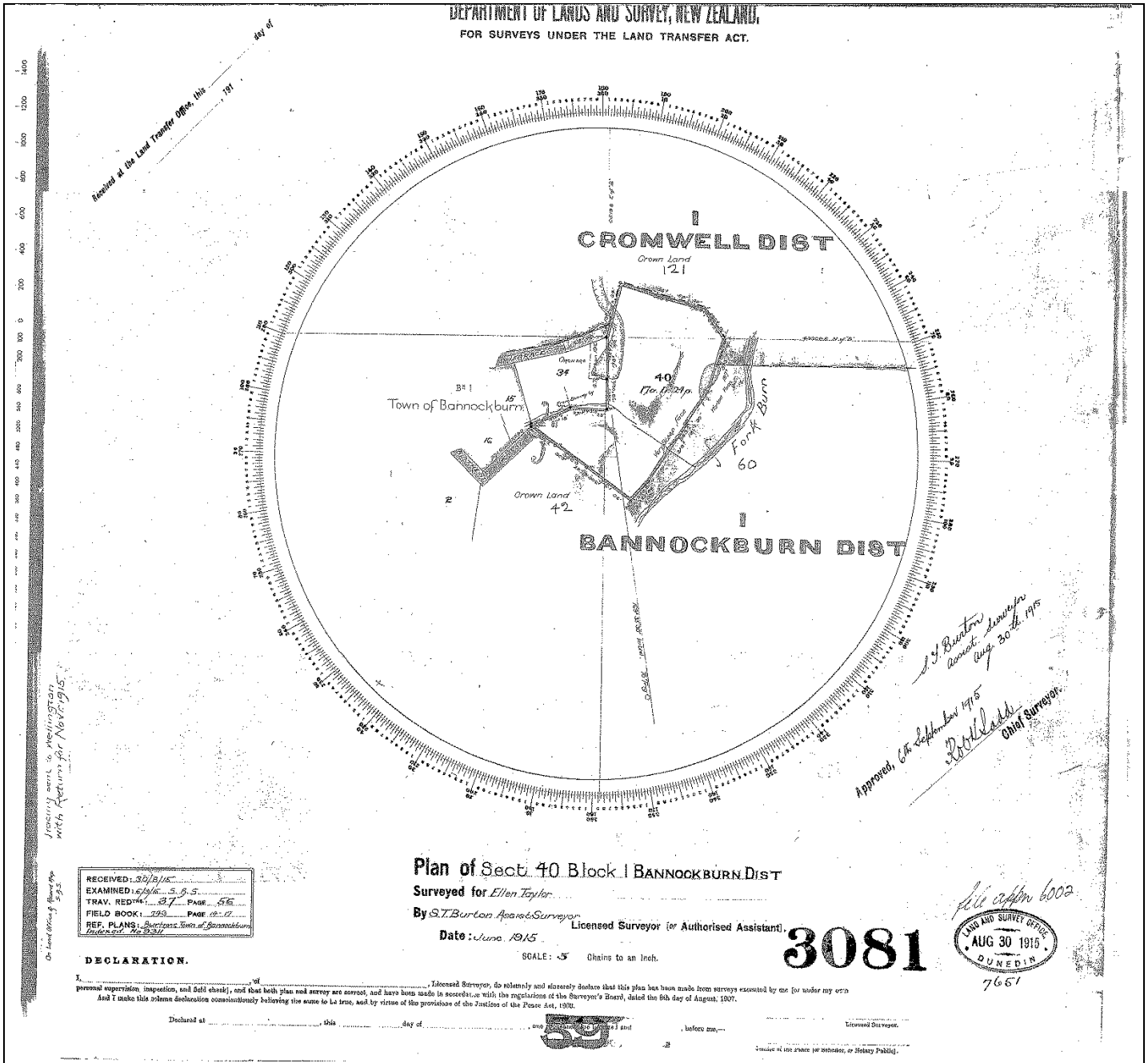


Figure 28 SO_3081 June 1915 _Sect 40 (Water Race Hill) surveyed for Ellen Taylor married to Jack Taylor local miner, carter & mail contractor with Pennyweights & Fork Burn (Shepherds Ck) sluicing's shown.

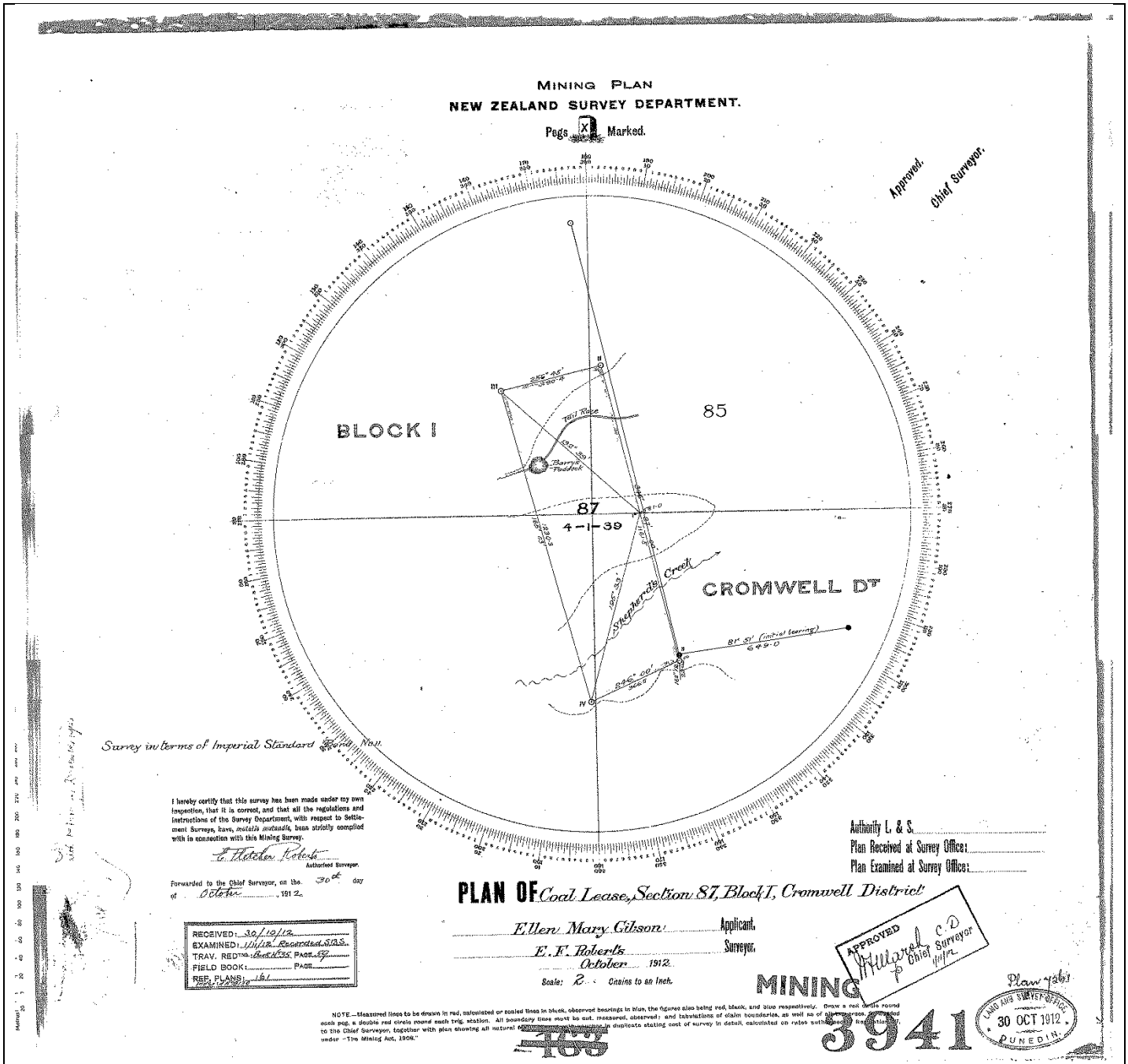


Figure 29 SO_3941 Oct 1912 Sect 87 Coal Lease – for Ellen Mary Gibson over a portion of Water Race Hill Lot 4. Mrs. Gibson was married to James Gibson Gold & Coal Miner in Bannockburn

Historic Images



Figure 30 1905 Bannockburn view over Kawarau across Shepherds Creek to Bannockburn and Mt Difficulty. Revell's Gully & Lot 4 centre right & dredge operating bottom left. (RW Murray Slide Collection) 01



Figure 31 Harry Burrows & Peter the goat - Revell's Gorge looking west -The Last Bannockburn Sluicer. Bannockburn History Project



Figure 32 Cairnmuir Coal Mine – Bannockburn Creek – one of several that operated via underground working in the Shepherds Bannockburn Creek & Revell's Gully with drives in under Slaughteryard Hill Source The Bannockburn History Project Paul Crump.

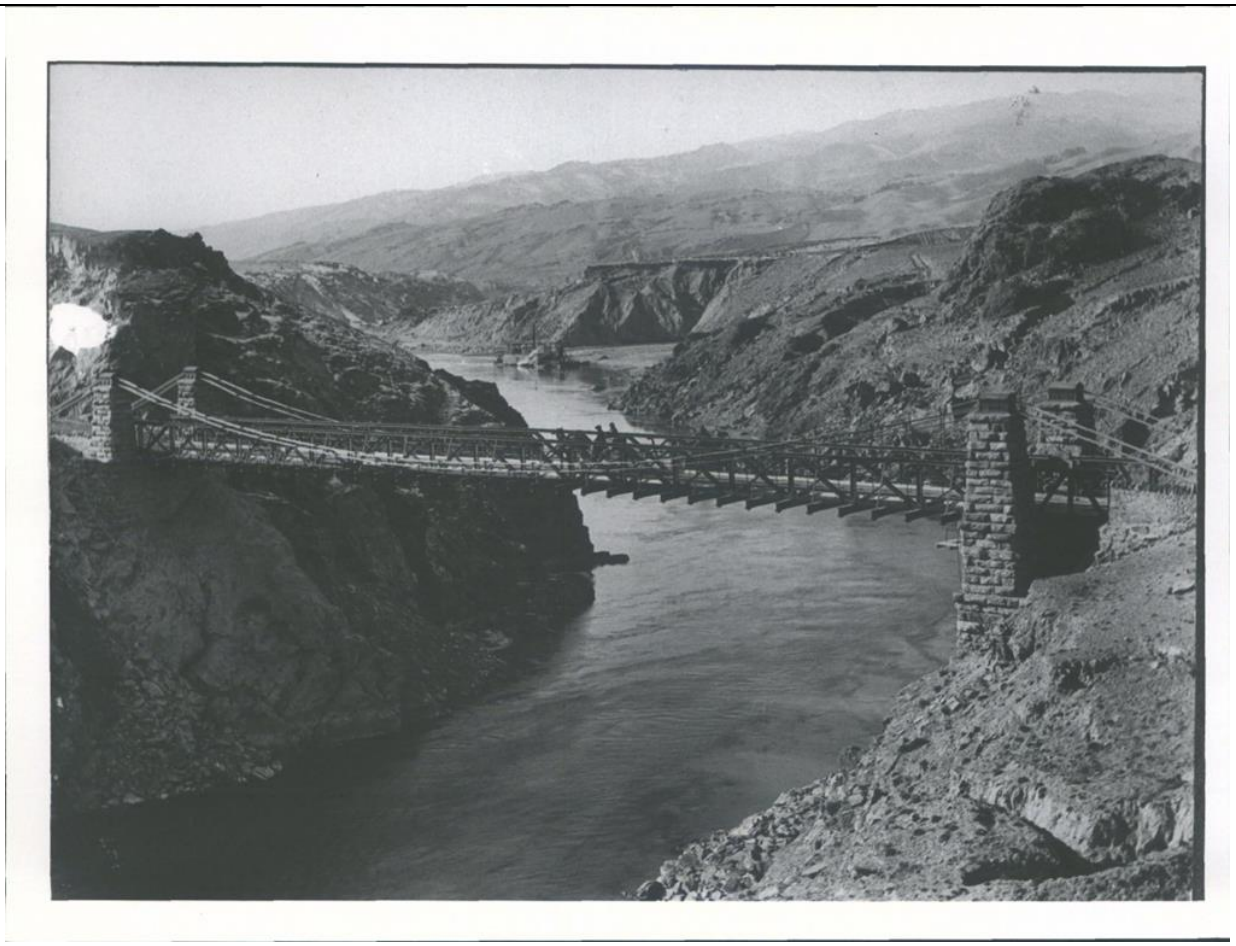


Figure 33 Bannockburn Bridge & dredge undated Hocken 0211_01_017A

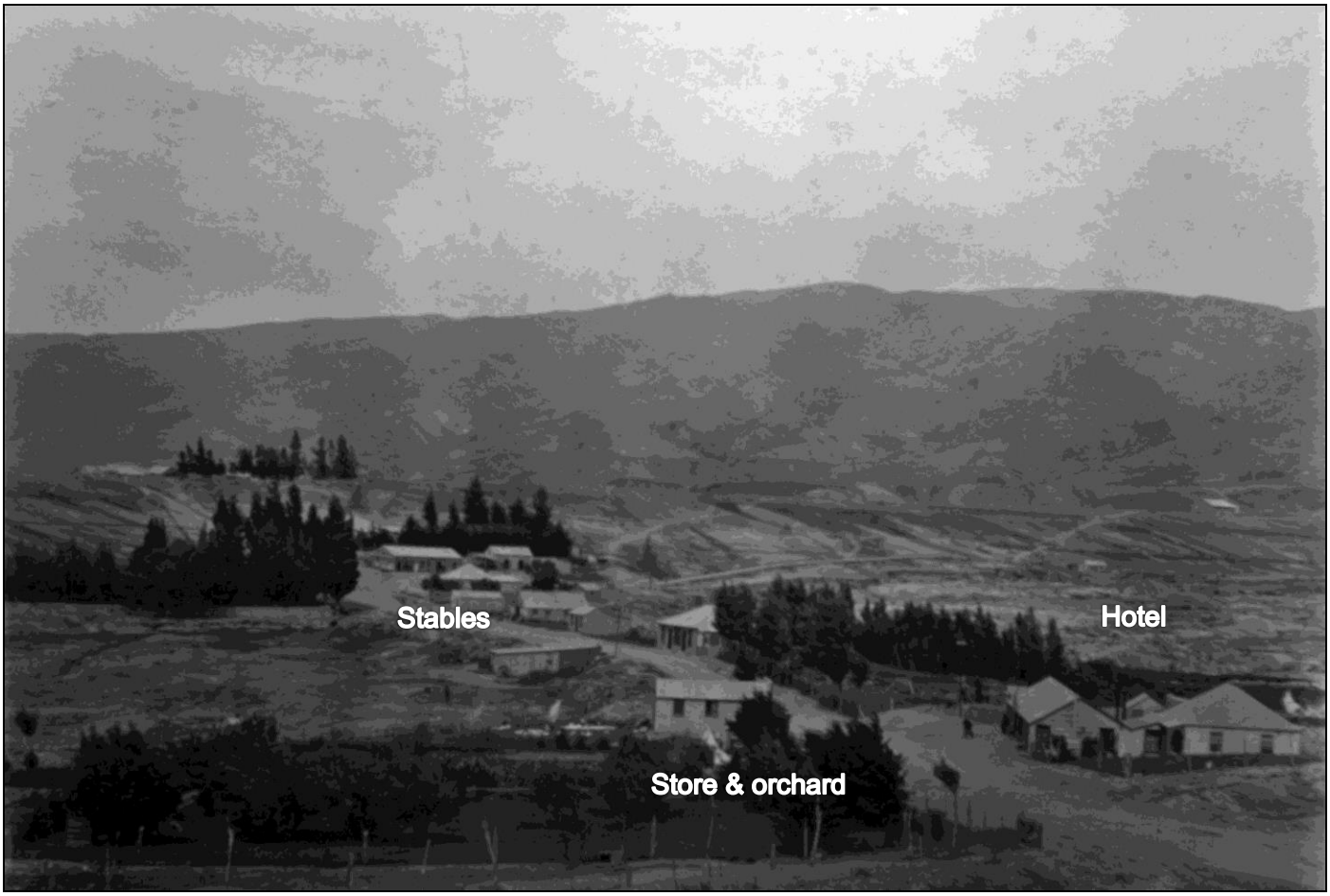


Figure 34 Bannockburn view of historic stables west end of Revell's workings, store & orchard and hotel (RW Murray Slide Collection) 04



Figure 35 Lauderburn water race fluming across Manuherekia River (undated) north of Ophir race flume constructed Nov 1866. This is example of likely fluming to convey race water across Revell's Gorge

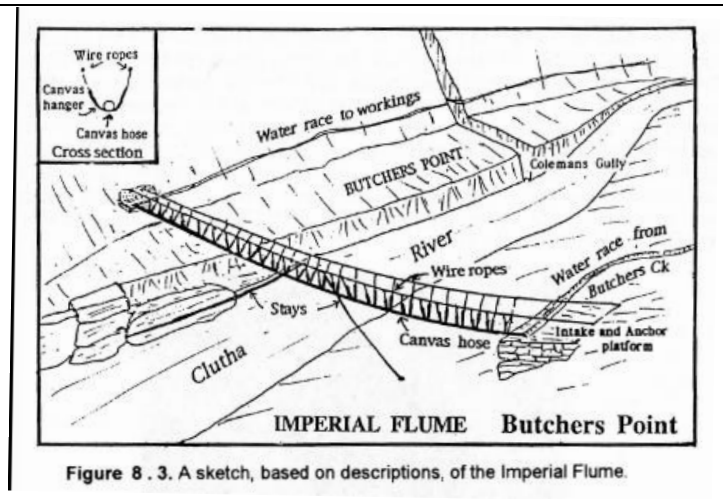


Figure 36 A sketch based on the descriptions of the Imperial Company flume to convey race water from Butchers Creek across the Clutha River to Butchers Point in 1865 – J McCraw

Historic Plans

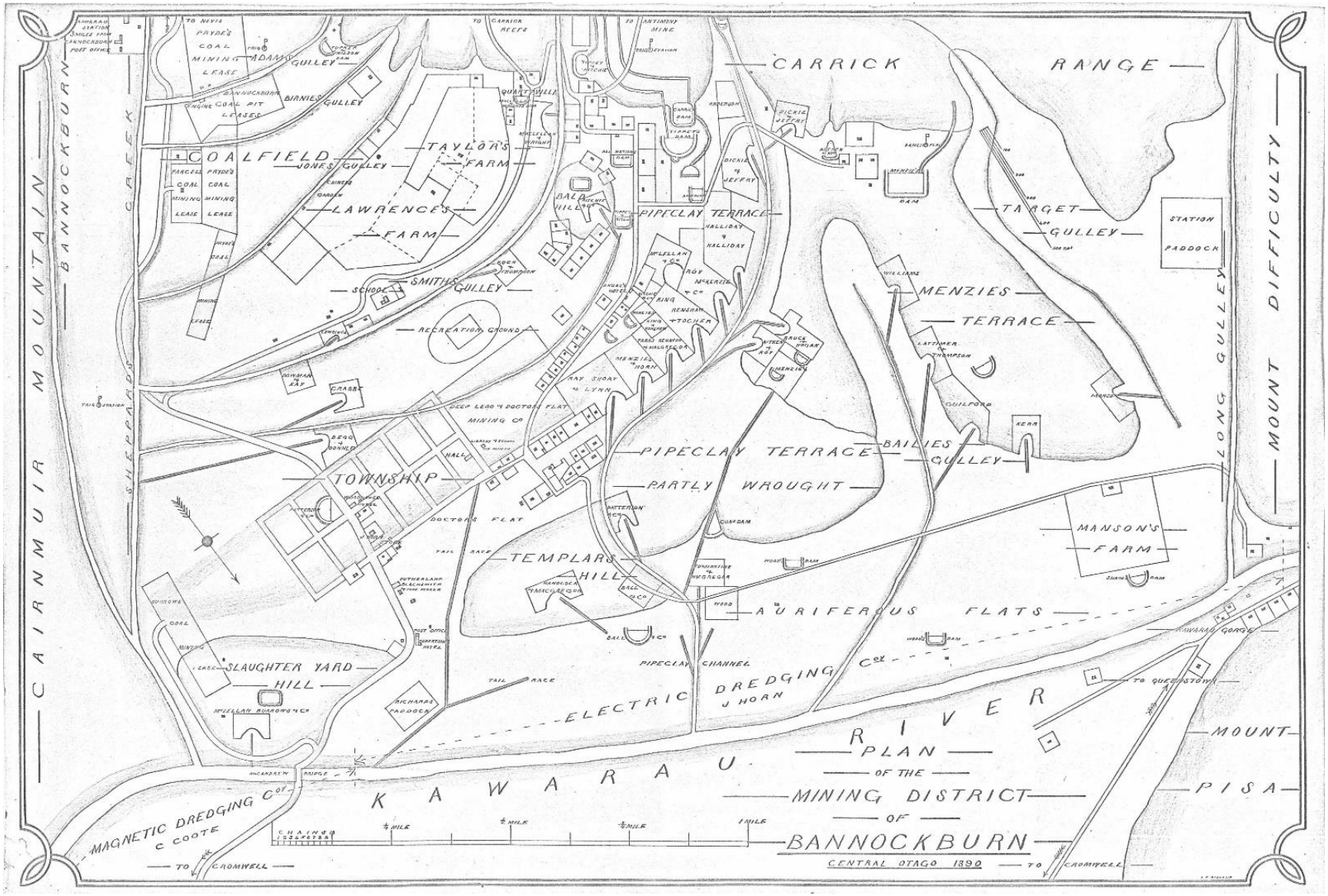


Figure 37 Map produced for sale in 1890 by Andrew Farquarson Ridland of Bannockburn, a goldminer who worked on the Carrick Range, quartz goldmining. At least fifteen copies were hand-drawn and coloured, framed in gilt, and sold for 30 shillings. R. Murray, Cromwell, P. Crump Collection.

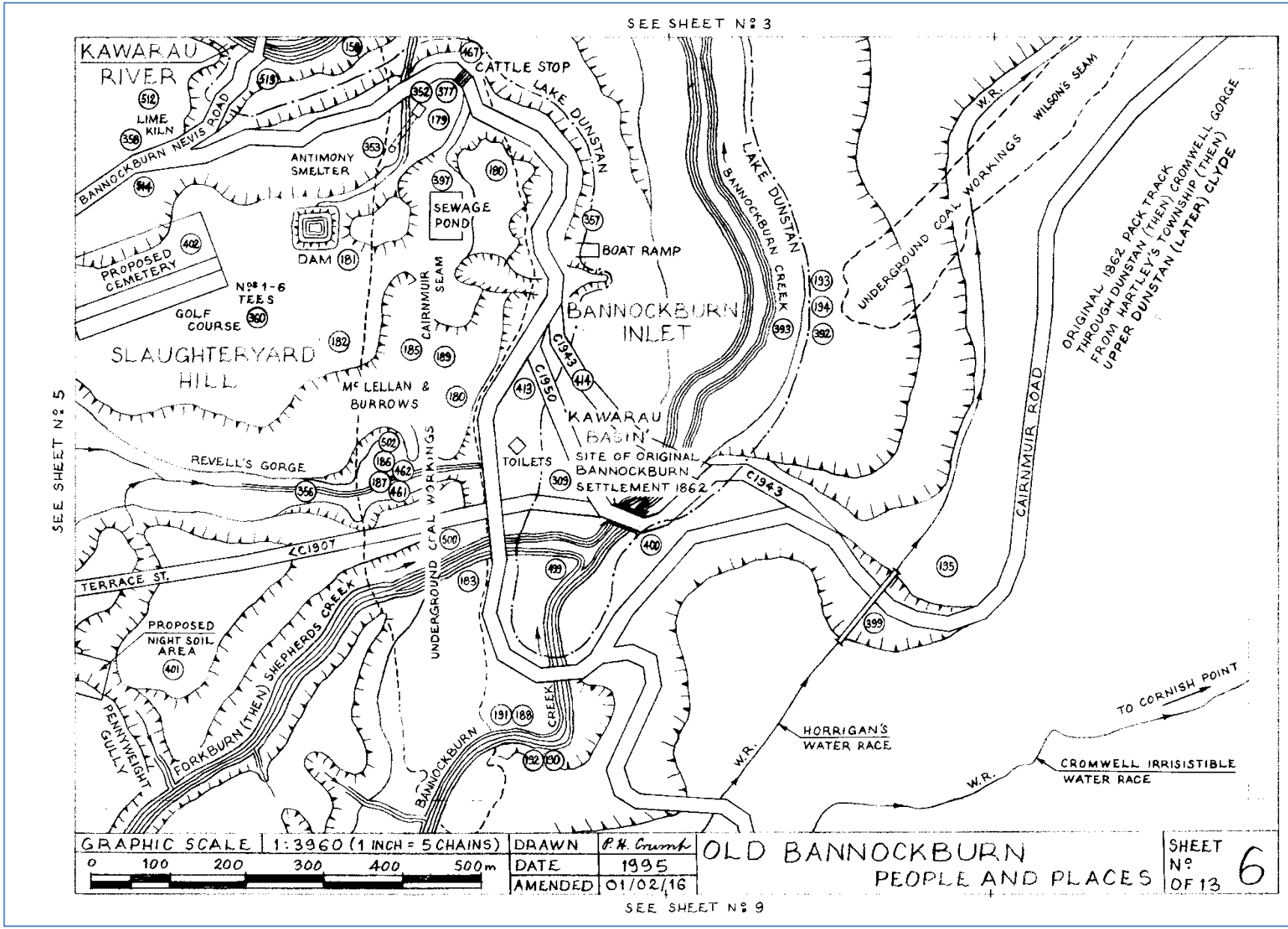


Figure 38 Sheet 6 of 13 – covering Water race hill, Revell's Gorge, Slaughteryard Hill Source Bannockburn Heritage Project 2020 Paul Crump 1995

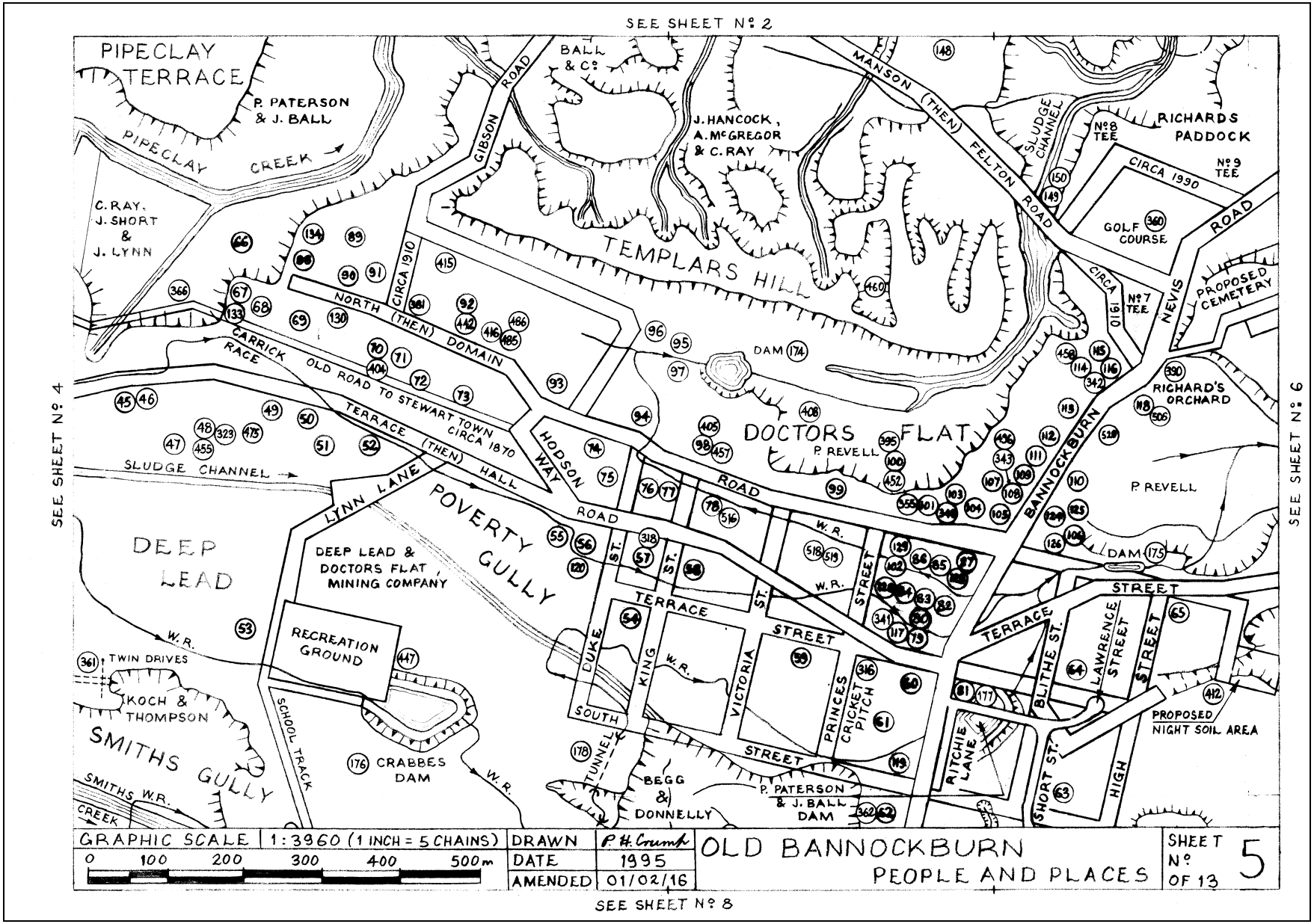


Figure 39 Sheet 5 of 13 – covering Main Street Bannockburn #110 stables site, P Revell's sluicing's, Source Bannockburn Heritage Project 2020 Paul Crump 1995

Associated NZAA site records

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD FORM (NZMS 1)

NZMS 1 map number: Cromwell
NZMS 1 map name: S133
NZMS 1 map edition: 1st., 1969

NZAA NZMS 1 SITE NUMBER: S133/809
DATE VISITED: 9 February 1982
SITE TYPE: Water Race
SITE NAME: MAORI
OTHER

Grid Reference — Easting 2 9 9 3 0 0 — Northing 3 6 4 6 0 0

1. Aids to relocation of site *(attach a sketch map)*

The race runs from a dam on Dennisons property (corner of Hall Road, Bannockburn) via S133/808, a sluiced gully, to S133/825, an area of sluicings. The last part of the race traverses the true left bank of Shepherds Creek, c.70m above the creek bed.

2. State of site and possible future damage

Good condition- the first section is still in use.

3. Description of site *(Supply full details, history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here)*

The site appears to be a former mining water race which is now used for irrigation. It flows from a dam at GR 988 641, to the sluicings (S133/825) at GR 993 650. There are side races to S133/808 and to the upper end of S133/825.

4. Owner Address: D. Jones, Ripponvale

Tenant/Manager Address:

5. Nature of information *(hearsay, brief or extended visit, etc.)*: Bannockburn Survey

Photographs *(reference numbers, and where they are held)*

Aerial photographs *(reference numbers, and clarity of site)*

6. Reported by: N.Ritchie and J.Smith
Address: nBannockburn Survey, Clutha Valley Development, Cromwell

Filekeeper: NEVILLE A RITCHIE, ARCHAEOLOGIST (N.Z.H.P.T.), CLUTHA VALLEY DEVELOPMENT, CROMWELL
Date:

7. Key words: Water race, still in use.

8. New Zealand Register of Archaeological Sites *(for office use)*
NZHPT Site Field Code

E U	Type of site	A A — Present condition and future danger of destruction
A G	Local environment today	A A — Security code
A C	Land classification	H P — Local body

Figure 40 F41-369 S133-809 Upper Water race to Pennyweights, Revell's Sluicing's, & Slaughteryard Hill reservoir

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD FORM (NZMS 1)

NZMS 1 map number S133
NZMS 1 map name Cromwell
NZMS 1 map edition 1st., 1969.

NZAA NZMS 1 SITE NUMBER S133/806
DATE VISITED 9 Feb 82
SITE TYPE Dam
SITE NAME: MAORI
OTHER

Grid Reference Easting 2 9 8 7 0 0 Northing 3 6 4 4 0 0

1. Aids to relocation of site *(attach a sketch map)* Situated 70m east of Bannockburn Road, and approximately 100m south east of a water race (S133/808). The race is situated 200m east of the Bannockburn road at a point opposite the Hall Road turn off.

2. State of site and possible future damage

Reasonable. Refer to the description.

3. Description of site *(Supply full details, history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here)*
The site consists of an earth walled mining dam with stone facing on the inside to prevent erosion through wave action. The walls stand about 1m high. The dam itself covers an area of 60m x 40m. It is probably Patterson and Co.'s dam as marked on Ridlands 1890 map.

4. Owner D. Jones
Address Ripponvale
Tenant/Manager
Address

5. Nature of information *(hearsay, brief or extended visit, etc.)* Bannockburn Survey
Photographs *(reference numbers, and where they are held)*
Aerial photographs *(reference numbers, and clarity of site)*

6. Reported by N.Ritchie and J.Smith
Address Bannockburn Survey
Clutha Valley Development
Private Bag, Cromwell
Filekeeper NEVILLE A RITCHIE
Date ARCHAEOLOGIST (N.Z.H.P.T.)
CLUTHA VALLEY DEVELOPMENT
CROMWELL

7. Key words Mining dam, earth walled, stone faced.

8. New Zealand Register of Archaeological Sites *(for office use)*
NZHPT Site Field Code

G C	Type of site	B B	Present condition and future danger of destruction
- -	Local environment today	A A	Security code
A C	Land classification	H P	Local body

Figure 41. F41-366 S133-806 Dam Patterson & Co original source of water race hill water races

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD FORM (NZMS 1)

NZMS 1 map number S133
NZMS 1 map name Cromwell
NZMS 1 map edition 1st., 1969.

NZAA NZMS 1 SITE NUMBER S133/808
DATE VISITED 9 Feb 82
SITE TYPE Sluice gully
SITE NAME: MAORI
OTHER

Grid Reference Easting 2 9 9 1 0 0 Northing 3 6 4 6 0 0

1. Aids to relocation of site *(attach a sketch map)* The site is situated 200m east of the Bannockburn Road, from a point opposite the Hall Road turn off.

2. State of site and possible future damage
Refer to the description.

3. Description of site *(Supply full details, history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here)*

The site consists of a boomerang shaped sluice gully created by ground sluicing in the relatively flat ground at this point. The gully debouches onto the lower flat area at the head of the gully in which S133/825 (tailings) are located.
The site is 200m long with an average width of 30m, and average depth of 5-10metres.
Water was brought to the site by feeders from race S133/809, the water being stored in a small dam at GR 988 647.

Refer to the aerial photograph- the dam appears to be of a more recent construction.

4. Owner D.Jones
Address Ripponvale
Tenant/Manager
Address

5. Nature of information *(hearsay, brief or extended visit, etc.)* Bannockburn Survey
Photographs *(reference numbers, and where they are held)*
Aerial photographs *(reference numbers, and clarity of site)*

6. Reported by N.Ritchie and J.Smith
Address Bannockburn Survey
Clutha Valley Development
Cromwell.
Filekeeper NEVILLE A RITCHIE
Date ARCHAEOLOGIST (N Z.H.P.T.)
CLUTHA VALLEY DEVELOPMENT
CROMWELL

7. Key words
sluice gully

8. New Zealand Register of Archaeological Sites *(for office use)*
NZHPT Site Field Code

C	T	Type of site	B	D	Present condition and future danger of destruction
A	G	Local environment today	A	A	Security code
A	C	Land classification	H	P	Local body

Figure 42 F41-368 S133-808 Pennyweights Gully Sluicing's supply by F41-369 S133-809 upper water race – Water Race Hill

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD FORM (NZMS 1)

NZMS 1 map number S133
NZMS 1 map name Cromwell
NZMS 1 map edition 1st., 1969.

NZAA NZMS 1 SITE NUMBER S133/812
DATE VISITED 9 February 1982
SITE TYPE Water Race
SITE NAME: MAORI
OTHER

Grid Reference Easting 2 9 9 3 0 0 Northing 3 6 4 7 0 0

1. Aids to relocation of site *(attach a sketch map)* The race is situated on the true left situated on the true left side of Shepherds Creek, about 100m above the creek.

2. State of site and possible future damage

The race is on a reasonably well defined bench.

3. Description of site *(Supply full details, history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here)*

The race is discernable from Smiths Gully (GR 998 643) to the sluicing coal mining lease site (S133/824) above Cairnmuir Road.
The race traverses along the true left bank of Shepherds Creek c. 50-100m above the creek. On the uphill side of the race for much of its course throught the small gorge of Shepherds Creek there is a wire boundary fence with rabbit netting and occasional poplar trees.

4. Owner Address Patterson, Cairnmuir Station.
Tenant/Manager Address

5. Nature of information *(hearsay, brief or extended visit, etc.)* Bannockburn Survey

Photographs *(reference numbers, and where they are held)*

Aerial photographs *(reference numbers, and clarity of site)*

6. Reported by Address M.Ritchie and J.Smith
Bannockburn Survey
Clutha Valley Development
Cromwell
Filekeeper Date NEVILLE A RITCHIE ARCHAEOLOGIST (N.Z.H.P.T.) CLUTHA VALLEY DEVELOPMENT CROMWELL

7. Key words Water race, well defined.

8. New Zealand Register of Archaeological Sites *(for office use)*
NZHPT Site Field Code

E	W	Type of site
A	K	Local environment today
A	C	Land classification
B	B	Present condition and future danger of destruction
A	A	Security code
H	P	Local body

Figure 43 F41-372 S133-812 water race True Left above Shepherds Ck running along bottom boundary of Lot 4 Water Race Hill with historic post & wire fence and remnant poplar trees & small sluicing's

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD FORM (NZMS 1)

NZMS 1 map number S133
NZMS 1 map name Cromwell
NZMS 1 map edition 1st., 1969.

NZAA NZMS 1 SITE NUMBER S133/840
DATE VISITED 9 February 1982
SITE TYPE Mining Dam
SITE NAME: MAORI
OTHER

Grid Reference Easting 2 9 9 2 0 0 Northing 3 6 5 3 0 0

1. Aids to relocation of site *(attach a sketch map)* The dam is located on the NW side of Slaughteryard Hill, c.30m below the rocky summit.

2. State of site and possible future damage

Only remnants of the earth and stone faces walls survive in some sections.

3. Description of site *(Supply full details, history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here)*

A pentagonal dam made of rammed earth and stone. The walls have been heavily eroded by the weather and stock trampling. Approximate area is 50m x 50m. The maximum height of the surviving walls is 60cm.
The dam appears to be associated with a sluicing and coal mining lease c.200m east of the dam. According to Ridlands map, 1890, the dam belonged to McLellon, Burrows and Co. The adjacent coal lease is labelled Burrows Burrows Coal Lease.
Two finds of Chinese ceramic brownware sherds were found, yet there is no trace of any habitations of any sort of hut platforms. Possibly some Chinese were employed on the site.

4. Owner D.Jones
Address Ripponvale

Tenant/Manager
Address

5. Nature of information *(hearsay, brief or extended visit, etc.)* Bannockburn Survey

Photographs *(reference numbers, and where they are held)*

Aerial photographs *(reference numbers, and clarity of site)*

6. Reported by N.Ritchie and J.Smith
Address Bannockburn Survey
Clutha Valley Development
Cromwell

Filekeeper NEVILLE A. RITCHIE
Date ARCHAEOLOGIST (N.Z.H.P.T.)
CLUTHA VALLEY DEVELOPMENT
CROMWELL

7. Key words Rammed eath dam, stone faced.

8. New Zealand Register of Archaeological Sites *(for office use)*
NZHPT Site Field Code

G	C	Type of site
B	E	Local environment today
A	C	Land classification
B	B	Present condition and future danger of destruction
A	A	Security code
H	P	Local body

0

Figure 44 F41-399 S133-0840_Reservoir Slaughteryard Hill

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE DESCRIPTION FORM

Map Number S133
Map Name Cromwell
Map Edition 1st, 1969
Grid Reference 992 653

SITE NUMBER S/33/840

SITE NAME: MAORI / OTHER

SITE TYPE Mining dam

(This form may be used for recording any descriptive information or other supplementary information on the site, or for maps and drawings.)

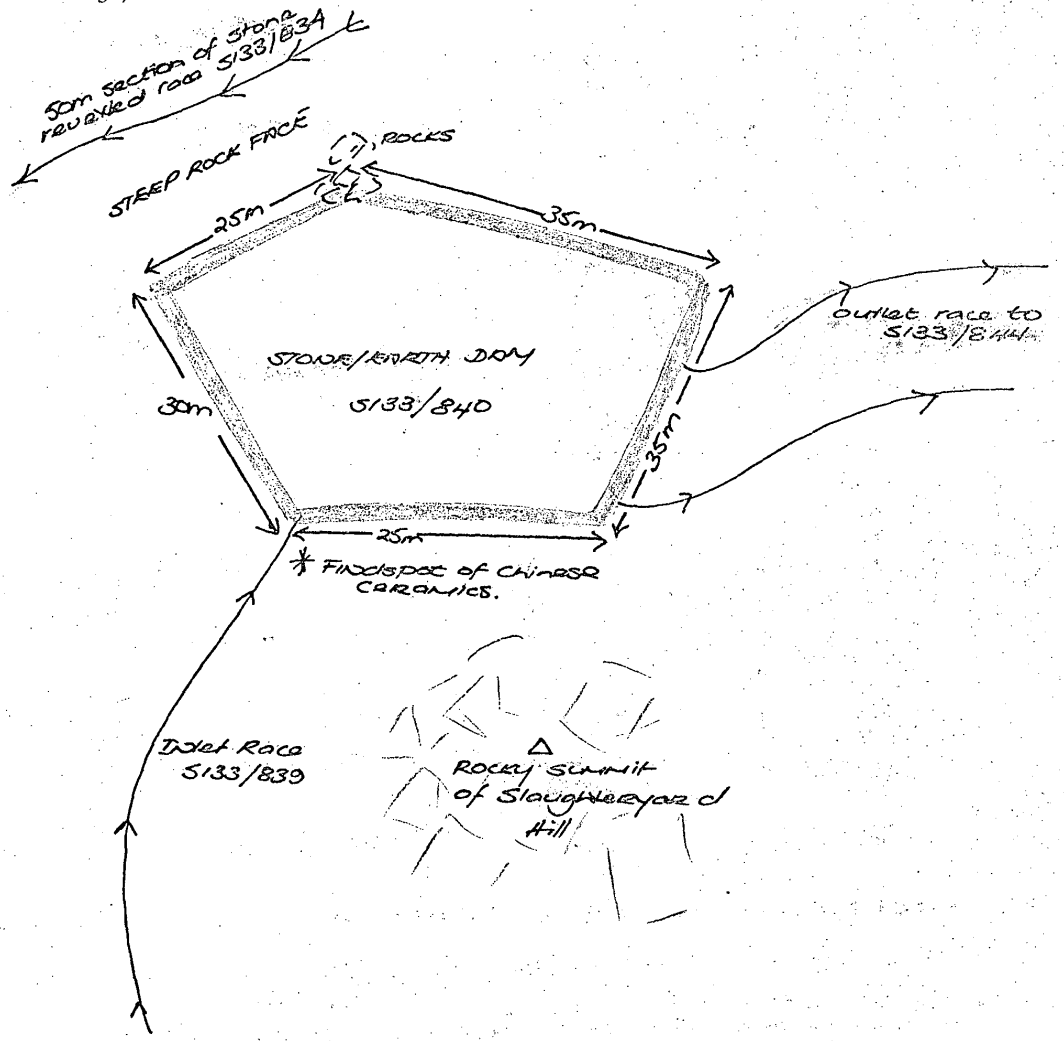


Figure 45 F41-399 S133-0840_Reservoir Slaughteryard Hill plan

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD FORM (NZMS 1)

NZMS 1 map number S133
NZMS 1 map name Cromwell
NZMS 1 map edition 1st., 1969

NZAA NZMS 1 SITE NUMBER S133/839
DATE VISITED 9 February 1982
SITE TYPE Water Race
SITE NAME: MAORI
OTHER

Grid Reference Easting 8 9 9 0 0 0 Northing 3 6 5 2 0 0

1. Aids to relocation of site *(attach a sketch map)* The site is located on the west side of Slaughteryard Hill, entering the dam (S133/840) at its SW corner.

2. State of site and possible future damage

Refer to the description.

3. Description of site *(Supply full details, history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here)*

Although this race appears to be the head race for filling the dam (S133/840), we were only able to follow the track along the west side of Slaughteryard Hill for about 130m before it petered out. From this point it was not readily apparent from where it conveyed water.

4. Owner Address D. Jones Ripponvale

Tenant/Manager Address

5. Nature of information *(hearsay, brief or extended visit, etc.)* Bannockburn Survey

Photographs *(reference numbers, and where they are held)*

Aerial photographs *(reference numbers, and clarity of site)*

6. Reported by Address N.Ritchie and J.Smith
Bannockburn Survey
Clutha Valley Development
Cromwell

Filekeeper Date NEVILLE A RITCHIE
ARCHAEOLOGIST (N.Z.H.P.T.)
CLUTHA VALLEY DEVELOPMENT
CROMWELL

7. Key words

Water race.

8. New Zealand Register of Archaeological Sites *(for office use)*
NZHPT Site Field Code

E	U	Type of site	B	B	Present condition and future danger of destruction
B	E	Local environment today	A	A	Security code
A	C	Land classification	H	P	Local body

Figure 46 F41-398 S133-839 remnant section of water race Slaughteryard Hill supplying Slaughteryard Hill Reservoir & Chinese occupation site. A now isolated extension off F41-369 S133 - 809 upper water race (water race hill) likely via a canvas pipe flume across Revell's Gully.

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD FORM (NZMS1)

NZMS 1 map number S133
NZMS 1 map name Cromwell
NZMS 1 map edition 1st., 1969.

NZAA NZMS 1 SITE NUMBER S133/825
DATE VISITED 9 Feb 82
SITE TYPE Ground sluicing and associated races.
SITE NAME: MAORI / OTHER

Grid Reference Easting 9 9 3 0 0 Northing 3 6 5 0 0

1. Aids to relocation of site *(attach a sketch map)* The workings are in a small gully, a small tributary of Shepherds Creek. The gully commences on the flat opposite the Bannockburn Hotel and flows through a small gully to join Shepherds Creek at GR 996 650.

2. State of site and possible future damage
Partly overgrown with willows and briar.

3. Description of site *(Supply full details, history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here)*

This site abuts onto S133/840 a mining dam. The site has been formed through ground sluicing the sides of a small gully. On the north side of the gully two water races brought water for the sluicing from the vicinity of the Bannockburn Hotel. Most of the working is on the north side. It has been suggested that a walkway will be formed through this gully to Bannockburn from the future Bannockburn Inlet.

4. Owner
Address D. Jones
Ripponvale

Tenant/Manager
Address

5. Nature of information *(hearsay, brief or extended visit, etc.)* Bannockburn Survey

Photographs *(reference numbers, and where they are held)*

Aerial photographs *(reference numbers, and clarity of site)*

6. Reported by
Address N.Ritchie and J.Smith
Bannockburn Survey
Clutha Valley Development
Cromwell

Filekeeper
Date NEVILLE A RITCHIE
ARCHAEOLOGIST (N.Z.H.P.T.)
CLUTHA VALLEY DEVELOPMENT
CROMWELL

7. Key words Sluicings, ground, with associated water races.

8. New Zealand Register of Archaeological Sites *(for office use)*
NZHPT Site Field Code

C	T	Type of site	
A	6	Local environment today	
A	C	Land classification	
B	B		Present condition and future danger of destruction
A	A		Security code
H	P		Local body

Figure 47 F41-385 S133-825 Revell's Basin workings & races – track

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

SITE RECORD FORM (NZMS 1)

NZMS 1 map number S133
NZMS 1 map name Cromwell
NZMS 1 map edition 1st., 1969.

NZAA NZMS 1 SITE NUMBER S133/835
DATE VISITED 9 Feb 82
SITE TYPE Chinese Hut Site
SITE NAME: MAORI
OTHER

Grid Reference Easting 2 9 9 2 0 0 Northing 3 6 5 2 0 0

1. Aids to relocation of site *(attach a sketch map)*
The hut site is situated on the east side of Slaughteryard Hill, above S133/825, a tailing site, and 100m SW of S133/841, a sluicing area and coal lease.

2. State of site and possible future damage
Two walls of one hut remain- one of these stands 60cm high, whilst the other consists of a single layer of schist slabs atop a bank which has been excavated to a vertical face.

3. Description of site *(Supply full details, history, local environment, references, sketches, etc. If extra sheets are attached, include a summary here)*
The site consists of the visible remains of one small hut, but 6 earth platforms suggest that other tents or huts were once located in the near vicinity. Numerous pits and scattered artefactual debris attest to extensive fossicking of the site. Finds of sherds of celadon rice bowl, DVC and heavier Chinese brownware attest to its use at some stage, if not solely by Chinese, who were possibly mining at S133/825. The site appears to be quite early based on the presence of black glass. Numerous broken artefacts were found on the ground between the hut and the suspected hut platforms- some of these appear to rubbish scatters whilst others are clearly fossickers sorting piles.

4. Owner Douglas Jones
Address Ripponvale

Tenant/Manager
Address

5. Nature of information *(hearsay, brief or extended visit, etc.)* Bannockburn Survey

Photographs *(reference numbers, and where they are held)*

Aerial photographs *(reference numbers, and clarity of site)*

6. Reported by N.Ritchie and J.Smith
Address Bannockburn Survey
Clutha Valley Development
Cromwell.

Filekeeper NEVILLE A RITCHIE
Date ARCHAEOLOGIST (N.Z.H.P.T.)
CLUTHA VALLEY DEVELOPMENT
CROMWELL

7. Key words
Hut sites, Chinese

8. New Zealand Register of Archaeological Sites *(for office use)*
NZHPT Site Field Code

E	S	Type of site	B	D	Present condition and future danger of destruction
B	E	Local environment today	A	A	Security code
A	C	Land classification	H	P	Local body

Figure 48 F41-394 S133-835 Chinese Hut site & artefacts- Slaughteryard Hill supplied with water via small race from Slaughteryard Hill reservoir FF41-399 S133-840.

NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

ARCHSITE archaeological site recording scheme

Site Record Form

NZAA SITE NUMBER: F41/795

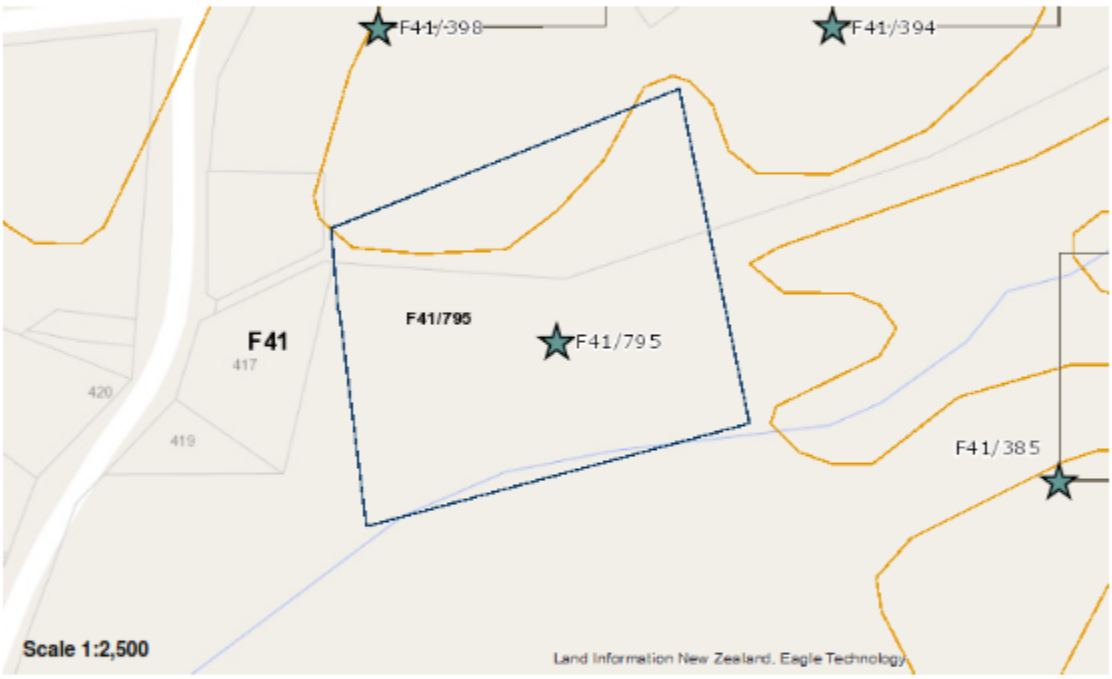
SITE TYPE: Mining - gold

SITE NAME(s): Revell's Gorge

DATE RECORDED:

SITE COORDINATES (NZTM) Easting: 1298237 **Northing:** 5000412 **Source:** On Screen

IMPERIAL SITE NUMBER: **METRIC SITE NUMBER:** F41/795



Finding aids to the location of the site

South of Slaughteryard Hill, Bannkockburn, at the end of a formed road (or track) cut through sluice faces of site F41/403. This leads to Bannockburn Road close to the Bannockburn Hotel.

Brief description

Revell's gorge is a broad sludge channel with a number of features such as short tail races, old sluicings, and piles of tailings, with sluice faces on the N side. Water races on Slaughteryard Hill lead to these faces.

Recorded features

Mining workings, Sluicings/ sluicing face, Tailings, Water race - tail race

Other sites associated with this site

F41/385, F41/403

Printed by: matthewsole 25/03/2020

1 of 7

Figure 49 F41-795 Revells Basin & Gorge Workings – Sluicing faces, hand stacked tailings, sluice & sludge channels, artefact scatters, claim markers, water races.

SITE RECORD HISTORY	NZAA SITE NUMBER: F41/795

Site description

Updated 08/05/2017 (Field visit), submitted by angelamiddleton , visited 30/04/2017 by Middleton Angela
Grid reference (E1298237 / N5000412)

Revell's gorge is a broad sludge channel with a number of features such as short tail races, old sluicings, and piles of tailings, with sluice faces on the northern side. Water races on Slaughteryard Hill lead to these faces. The area, named as Revell's gorge, appears on Paul Crump's map of Bannockburn (attached).

On screen site extent is approximate only.

Condition of the site

Updated 08/05/2017 (Field visit), submitted by angelamiddleton , visited 30/04/2017 by Middleton Angela

Features have been damaged by mountain bikers and other activities, recreational as well as structural.

Statement of condition

Updated: 14/05/2017, Visited: 30/04/2017 - Fair - Some intact features, but others may be unclear or damaged

Current land use:

Updated: 14/05/2017, Visited: 30/04/2017 - Rural residential, Reserve/ recreation, Services

Threats:

Updated: 14/05/2017, Visited: 30/04/2017 - Subdivision, Residential activities, Road/ track formation or maintenance, Property development, Services/ utilities

SITE RECORD INVENTORY	NZAA SITE NUMBER: F41/795

Supporting documentation held in ArchSite

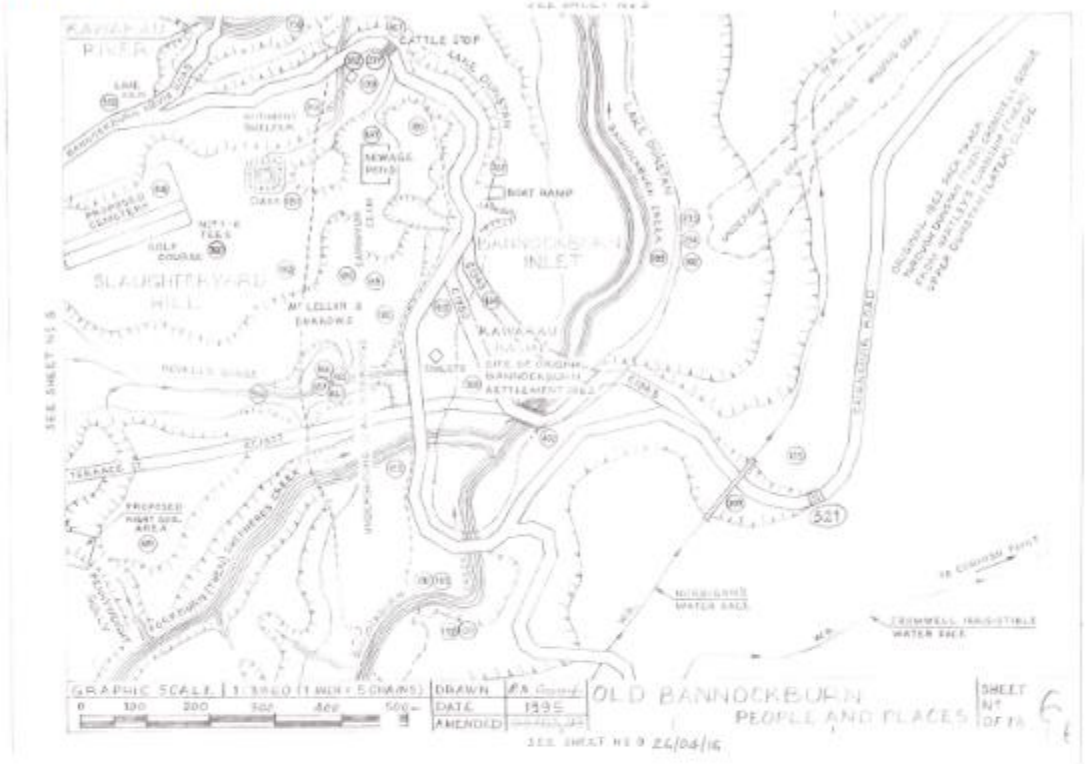
View over Revell's Gorge and features, to Bannockburn Road. Angela Middleton 30/4/2017



Water races along edge of Slaughteryard Hill, above Revell's Gorge sluice faces. Angela Middleton 30/4/2017



Paul Crump's 1995 map of Bannockburn. Revell's Gorge is named at the far left of the map, although this is poor quality and hard to read. Source: Matthew Sole.



Small tail race. Angela Middleton, 30/4/2017



NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION

Detail of tailings and disturbed ground in sludge channel. Angela Middleton 30/4/2017



Printed by: matthewsole

25/03/2020

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Criteria for evaluating heritage landscape effects.

Evaluating Heritage Landscapes (adapted from : Design Manual for Roads and Bridges, Volume 11 Environmental Assessment, Section 3 Environmental, Topics Part 2 Ha 08/07 Cultural Heritage – Scotland)

Individual historic assets, including archaeological remains and historic buildings contribute to historic landscape character, and the key assets should be identified together with an analysis of their contribution to the character of the unit. The value of individual historical or archaeological elements is not necessarily the determinant of the value of the historic landscape character unit to which they contribute. The presence of a scheduled monument (archaeologically 'high value'), for instance, does not necessarily confer great value to the historic landscape character unit in which it is found; and conversely, revetted schist wall ruins ('low value', say, in historic building terms) may be crucial in a 'high value' historic landscape.

Relevant factors to take into account may include:

- local character, local distinctiveness (including local residents' perceptions);
- time-depth: rarity or special interest/typicality (as judged by local, regional and national standards);
- legibility (complexity of the elements/parcels/ components and the completeness or articulation of the historic landscape, association of features, either of the same period or not);
- fragility/robustness (history of change, sensitivity to change, capacity to absorb change);
- cultural associations (including historical events, personages, literary or artistic connections, views);
- research potential (anticipation of further evidence).

Table 1 Evaluating Historic Landscape Character Units

Very High	• World Heritage Sites inscribed for their historic landscape qualities. • Historic landscapes of international value, whether designated or not. • Extremely well preserved historic landscapes with exceptional coherence, time-depth, or other critical factor(s).
High	• Designated historic landscapes of outstanding interest. • Undesignated landscapes of outstanding interest. • Undesignated landscapes of high quality and importance, and of demonstrable national value. • Well preserved historic landscapes, exhibiting considerable coherence, time-depth or other critical factor(s).
Medium	• Designated special historic landscapes. • Undesignated historic landscapes that would justify special historic landscape designation, landscapes of regional value. • Averagely well-preserved historic landscapes with reasonable coherence, time-depth or other critical factor(s).
Low	• Robust undesignated historic landscapes. • Historic landscapes with importance to local interest groups. • Historic landscapes whose value is limited by poor preservation and/or poor survival of contextual associations.
Negligible	• Landscapes with little or no significant historical interest.

(Source : Design Manual for Roads and Bridges, Volume 11 Environmental Assessment, Section 3 Environmental, Topics Part 2 Ha 08/07 Cultural Heritage - Scotland)

In developing or adopting methodologies for assessing the role of an asset's setting the archaeologist should bear in mind the principles summarised below:

- an asset's setting is its **relevant** surroundings;
- settings have **physical factors** which can be changed by a scheme, but it is the effect these changes have on the perception of the asset that is assessed;
- **context** is an aspect of setting where a relevant aspect of knowledge, belief or relationships may not be visible (or audible) at the site;
- settings are **experienced by people** as contributing to the understanding or appreciation of assets;
- **professional judgement** is required, using criteria measured against the scheme's Cultural Heritage Design Objectives.

Impacts caused by the project on many similar, possibly minor, historic elements may be cumulative, but for historic landscape character units such impacts may best be assessed as the totality of their impact on the historic landscape character unit. The assessment of such multiple impacts is not simply a matter of aggregating scores; it requires professional judgement to assess how these changes actually affect the character of the historic landscape unit.

Magnitude of an impact

The assessment should judge the magnitude of an impact bearing in mind the extremes that could occur, not just the range of changes that would occur on the scheme under consideration. The largest would be a total change to the historic character; the least would be no change to the historic character. The changes should be ranked in relation to these extremes. The scale of the magnitude of impact is as follows:

- Major;
- Moderate;
- Minor;
- Negligible;
- No change.

The factors to take into account in assessing the magnitude of the impact on historic landscape character include:

- how changes to archaeological remains and historic buildings would change the character of the historic landscape;
- changes affecting historic spatial patterns;
- changes of characteristic historic landscape elements;
- changes to vegetation;
- changes in vibration/visual intrusion/noise (including the nature of sounds);
- changes to landuse.

The important principle is the magnitude of the impact on the historic landscape character unit. If an historic landscape unit has been characterised as – say – a late 20th century transport and industrial corridor, then the addition of a new transport element may have little or no impact on its historic character, despite a large land-take and possibly considerable negative impacts on other cultural heritage assets. There could be little or no historic landscape character change. Conversely, a new dual carriageway, which may have no significant impacts on archaeological remains or historic buildings, built across an otherwise coherent and relatively untouched pre-enclosure landscape unit may change it into urban edge-land, a considerable alteration.

Table 2 Magnitude of Impact: Summary of Factors in the Assessment of Magnitude of Change

Factors in the Assessment of Magnitude of Change	
Major	Change to most or all key historic landscape elements, parcels or components; extreme visual effects; gross change of noise or change to sound quality; fundamental changes to use or access; resulting in total change to historic landscape character unit.
Moderate	Changes to many key historic landscape elements, parcels or components, visual change to many key aspects of the historic landscape, noticeable differences in noise or sound quality, considerable changes to use or access; resulting in moderate changes to

	historic landscape character.
Minor	Changes to few key historic landscape elements, parcels or components, slight visual changes to few key aspects of historic landscape, limited changes to noise levels or sound quality; slight changes to use or access: resulting in limited changes to historic landscape character.
Negligible	Very minor changes to key historic landscape elements, parcels or components, virtually unchanged visual effects, very slight changes in noise levels or sound quality; very slight changes to use or access; resulting in a very small change to historic landscape character.
No change	No change to elements, parcels or components; no visual or audible changes; no changes arising from in amenity or community factors.

Assessing Significance of Effects

The significance of the effect - that is, the extent to which the change to the historic landscape character matters – is the result of the value of the historic landscape character unit combined with the magnitude of the impact on it (incorporating the agreed mitigation). A large negative impact on a valuable historic landscape character unit would matter more than a large negative impact on a commonplace character unit. For instance, a new road scheme might totally change a late 20th century industrial landscape (historic landscape value: negligible) into a 21st century transport and communications landscape (value also negligible), so despite the high magnitude of impact (major change), when combined with the low value it would result in a slight or neutral significance of effect.

The judgement of the significance of effect should use the following scale:

- Very Large;
- Large;
- Moderate;
- Slight;
- Neutral.

Table 3 Significance of Effects Matrix

VALUE						
	Very High	Neutral	Slight	Moderate/ Large	Large or Very Large	Very Large
	High	Neutral	Slight	Moderate/ Slight	Moderate/ Large	Large/Very Large
	Medium	Neutral	Neutral/ Slight	Slight	Moderate	Moderate/ Large
	Low	Neutral	Neutral/ Slight	Neutral/ Slight	Slight	Slight/ Moderate
	Negligible	Neutral	Neutral	Neutral/ Slight	Neutral/ Slight	Slight
		No change	**Negligible**	**Minor**	**Moderate**	**Major**
		MAGNITUDE OF IMPACT				

Report photos supporting heritage features of significance.

Views of Water Race Hill from Slaughteryard Hill 2017

Archaeological site survey - Views of Water Race Hill from Slaughteryard Hill 29 03 2017.
Kopuwai Consulting



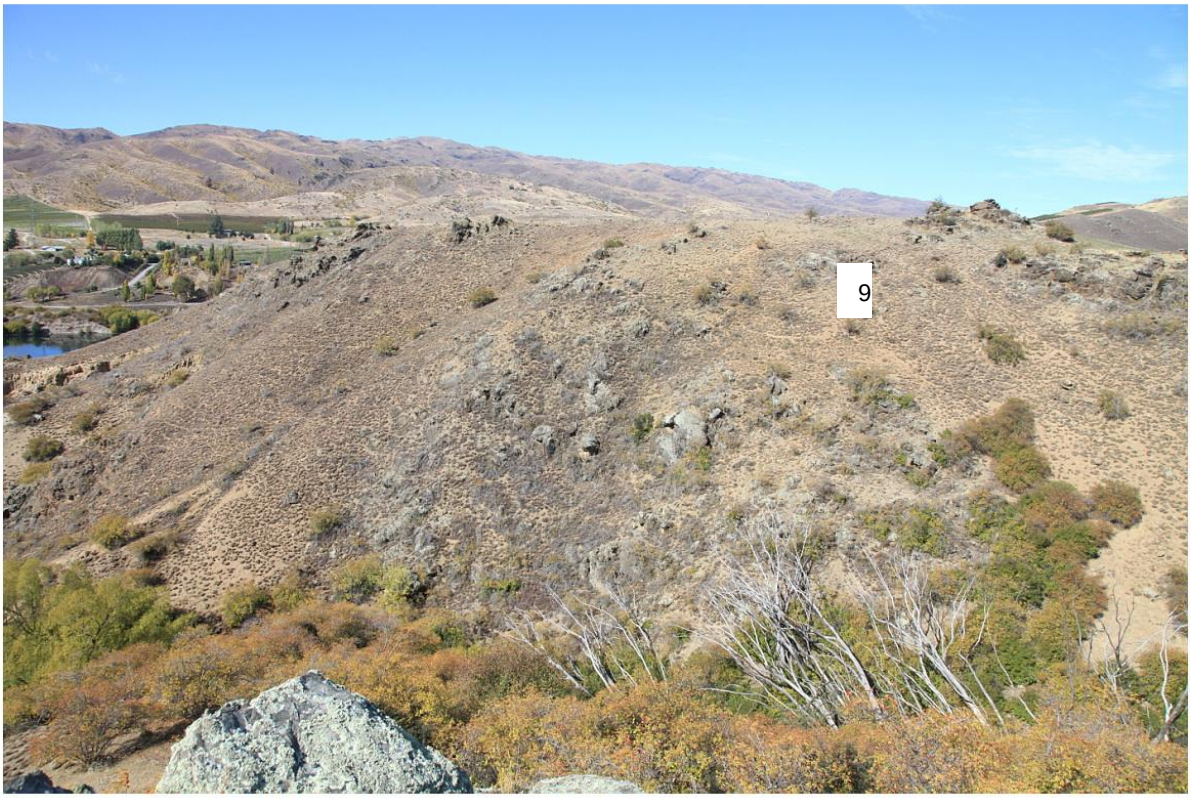
IMG_0604 view south from Slaughteryard Hill over Revells Gully to Water Race Hill off Terrace St.JPG



IMG_0605 view west from Slaughteryard Hill over Revells Basin to Bannockburn.JPG



IMG_0603 view south from Slaughteryard Hill over Revells Gully to Water Race Hill.JPG



IMG_0645Lot 4 Survey Revells 29 03 2017 -View over Revells Gullyy to Lot 200 heritage faces.JPG

Selection of heritage features Water Race Hill

Archaeological Survey - Water Race 2017 - Selection of heritage features.
Kopuwai Consulting Matthew Sole



IMG_0079Jones Lot 4 Initial Survey - View south across mid Pennyweights sluicing's .JPG



IMG_0081Jones Lot 4 Initial Survey - view NW down Pennyweights - shallow water race with turnouts arrowed - Revells basin beyond .JPG



IMG_0082Jones Lot 4 Initial Survey - view south up Pennyweights sluice face & water race Lot 9 .JPG



IMG_0099Jones Lot 4 Initial Survey - view south up Pennyweights workings & fitting in sluice face left.JPG



IMG_0098Jones Lot 4 Initial Survey - view off end of terrace Rd into Lots 7, 4 & 2 with water race traversing arrowed .JPG



IMG_0102Jones Lot 4 Initial Survey - view off Lot 1 sluice face into Lot 50 claim marker pedestal .JPG

Archaeological Survey - Water Race 2017 - Selection of heritage features.
Kopuwai Consulting Matthew Sole



IMG_0106Jones Lot 4 Initial Survey - view up cryptic water race view servicing Pennyweights sluicings through lot 1.JPG



IMG_0567Jones Lot 4 2017 - view of sluice faces & tailings below lots 17 & 16 above Shepherds Ck .JPG

Water Race Hill - Water Race features – preserve, adapt, destroy.

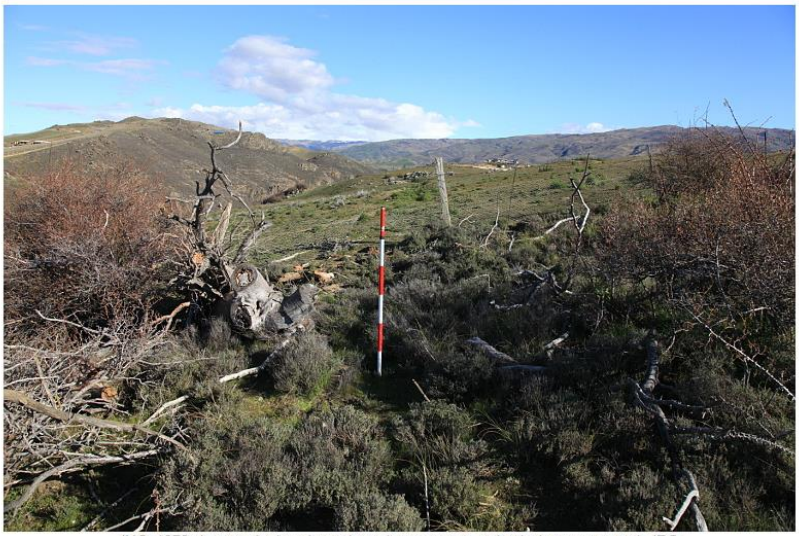
Archaeological Survey - Water Race Hill 2017 - Water Race features.
Kopuwai Consulting Matthew Sole



IMG_1981 View NE between upper (retain with landscapeing) & lower (adaptively reuse) branch water races Lot 30.JPG



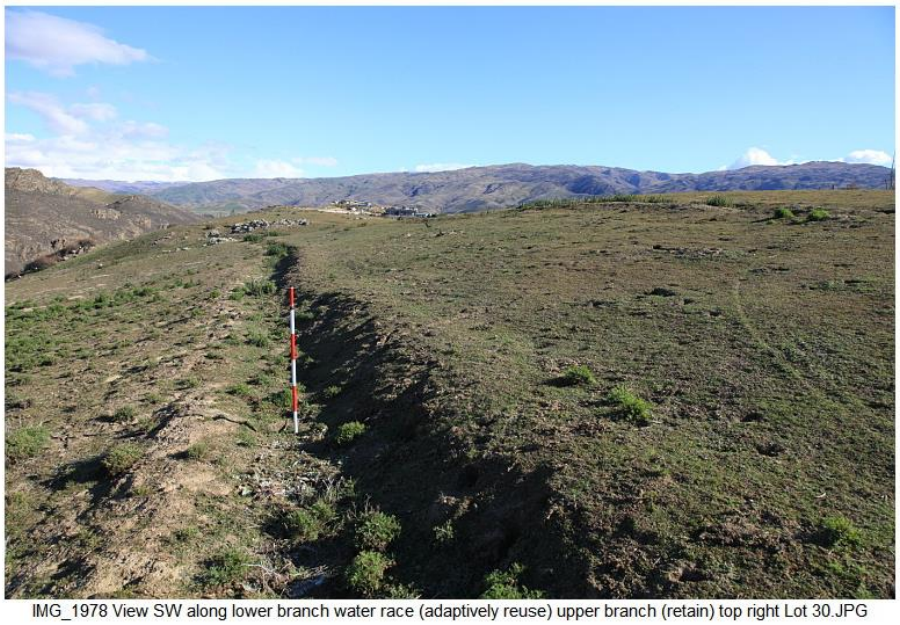
IMG_1980 view into lower branch water race - schist retained - (adaptively reuse) Lot 30 .JPG



IMG_1972 view south along lower branch water race - adaptively reuse as path.JPG



IMG_1973 view north along lower branch water race - adaptively reuse as path.JPG



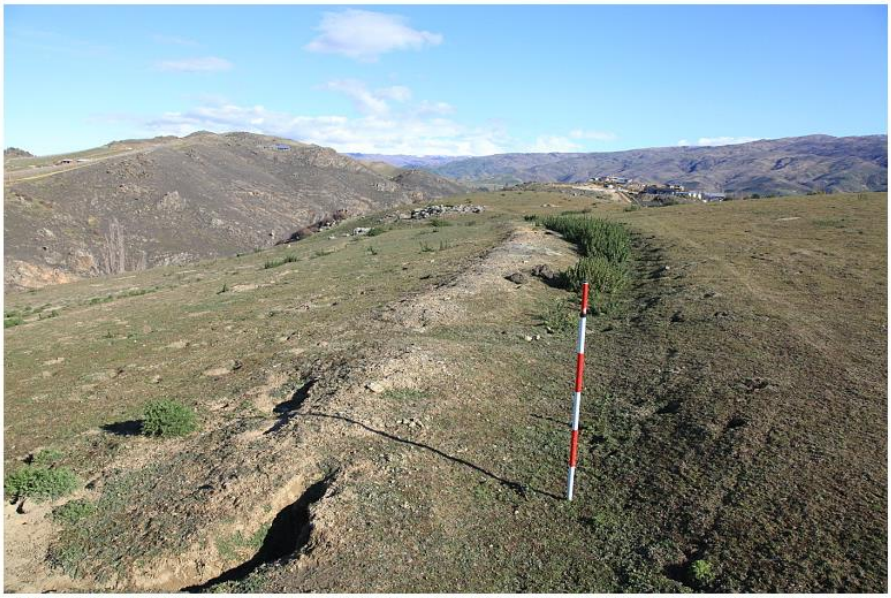
IMG_1978 View SW along lower branch water race (adaptively reuse) upper branch (retain) top right Lot 30.JPG



IMG_0562Jones Lot 4 2017 - view NE along lower branch of twin water race proposed for reuse as path.JPG



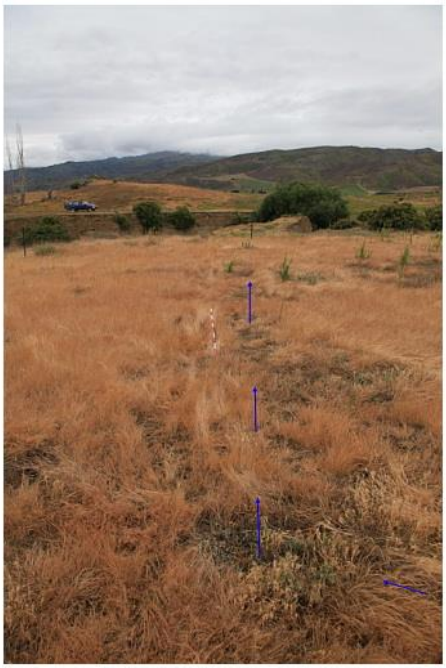
IMG_1977 View NE along upper branch water race (retain) subject landscape planting Lot 30 .JPG



IMG_1979 View SW along upper branch water race (retain) subject landscape planting lower twin below Lot 30.JPG



IMG_0565Jones Lot 4 2017 - view south along upper twin water race - (retain) with landscaping Lot 30.JPG



IMG_0104Jones Lot 4 Initial Survey - view ENW along water race servicing Pennyweights sluicings via Lot 1 arrowed - destroy .JPG

Water Race Hill – Heritage fence features Lot 4 boundary.

Archaeological Survey - Water Race Hill 2017 - Fence features Lot 4 boundary.
Kopuwai Consulting Matthew Sole



IMG_0086Jones Lot 4 Initial Survey - close up drilled hardwood post along farm stead fence line .JPG



IMG_0083Jones Lot 4 Initial Survey - view wnw along farm stead bdy fence line - netting barb hardwood & poplar below Lot 9 .JPG



IMG_0110Jones Lot 4 Initial Survey - remnant post Lot 5 .JPG

Archaeological Survey - Water Race Hill 2017 - Fence features Lot 4 boundary.
Kopuwai Consulting Matthew Sole



IMG_0569Jones Lot 4 2017 - view of hardwood totara post & fencelin - above Shepherds Ck .JPG



IMG_1969 view NE along heriatge fence line (salvage posts) .JPG



IMG_1970 view west along heriatge fence line (remove & salvage posts).JPG



IMG_1975 close up of heritage fence flat std 3 wire, barbwire & netting .JPG



IMG_1976 hardwood strainer by upper branch water .JPG



DSC00319 Strainer post Lot 4 south bdg Shepherds Ck.jpg

Archaeological Survey - Water Race Hill 2017 - Fence features Lot 4 boundary.
Kopuwai Consulting Matthew Sole



DSC00326 Lot 4 NE bdy crn strainer post .jpg

Water Race Hill – Revell's Gully & Lot 40 heritage features.

Archaeological Survey - Water Race Hill 2017 - Revell's Gully Lot 40 heritage features.
Kopuwai Consulting Matthew Sole



IMG_0580Jones Lot 4 2017 - view up Revells Gorge off proposed Lot 40 face into Lot 50 .JPG



IMG_0120Jones Lot 4 Initial Survey - hand stacked sludge channel rock upstream of Revells Gorge bluffs Lot 50 .JPG



IMG_0585Jones Lot 4 2017 view around Lot 40 faces over Revells Gully- .JPG



IMG_0577Jones Lot 4 2017 - view up sluiced gulch with handstacked tailings Lot 40 faces .JPG



IMG_0130Jones Lot 4 Initial Survey - view S across gully to stacked wall feature arrowed Lot 40 faces .JPG



IMG_0578Jones Lot 4 2017 - Revells Gully Lot 40 faces schist retained benched flat.JPG



IMG_0564Jones Lot 4 2017 - close view stacked schist on Lot 40 faces above Revells Gully below subdivision .JPG



IMG_0154Jones Lot 4 Initial Survey - old wooden survey peg near Water Race Hill historic fence line angle change Lot 40.JPG

Water Race Hill – Revell's Basin Heritage features.

Archaeological site survey - Water Race Hill - Revells Basin heritage features - 2017.
Kopuwai Consulting



IMG_0093Jones Lot 4 Initial Survey - view into sluicings with Lot 50 claim pedestal & spoil stockpile .JPG



IMG_0643Lot 4 Survey Revells 29 03 2017 - wide view SW over Revells Basin.JPG



IMG_0644Lot 4 Survey Revells 29 03 2017 - view down Revells Gully to Bannockburn Inlet.JPG



IMG_0587 View from Slaughteryard Hill S across Revells Basin to WRH Terrace St.JPG



DSC00360 Likely 1870's bottle Revells Gully.jpg



IMG_0641Lot 4 Survey Revells 29 03 2017 - view NW over sludge channel to ground sluicng.JPG

Slaughteryard Hill - heritage features

Archaeological site survey - Slaughteryard Hill heritage features - 2017.
Kopuwai Consulting



IMG_0599 Slaughteryard Hill Reservoir F41-399 - view east to Slaughteryard Hill.JPG



IMG_0600 Slaughteryard Hill Reservoir F41-399 - view north to Cromwell .JPG



IMG_0617 view over Revells Gully informal Bannockburn Inlet access tk.JPG



IMG_0618 view west up into Chinese occupation site Slaughteryard Hill F41-394.JPG



IMG_0620 Chinese occupation site building structure Slaughteryard Hill F41-394.JPG



IMG_0621Chinese occupation site sod wall remains Slaughteryard Hill F41-394.JPG



IMG_0624 Chinese occupation site building structure Slaughteryard Hill F41-394.JPG



IMG_0625 Chinese occupation site artefact scatters Slaughteryard Hill F41-394.JPG



IMG_0632 Slaughteryard Hill McLellan & Burrow water races.JPG



IMG_0675 F41-385 Trail Sluicings - stacked tailings lhs .JPG

Supporting material

Historic and Cultural Heritage Management Local Authority Good Practice Guide

Office of the
Parliamentary Commissioner for the Environment
Te Kaitiaki Taiao a Te Whare Paremata

HISTORIC AND CULTURAL HERITAGE MANAGEMENT LOCAL AUTHORITY GOOD PRACTICE GUIDE

The following guide to good practice does not constitute an exhaustive list of all aspects of the management of historic and cultural heritage but it is nevertheless recommended to all local authorities for consideration in their operations. Good practice is demonstrated when:

Policy development

1. Territorial authorities recognise their primary protection role for historic and cultural heritage under the Resource Management Act 1991 and use available protection measures accordingly.

2. Integrated heritage management between all responsible agencies is promoted at the regional level.

3. The historic and cultural heritage sections of regional policy statements and regional plans are implemented and heritage surveys are regionally coordinated where appropriate.

4. Processes are established for determining:
- who will be the lead protection agency to coordinate protection efforts by different agencies; and
- the appropriate financial contributions.

1. The International Council on Monuments and Sites New Zealand/Aotearoa Charter for the Conservation of Places of Cultural Heritage Value is adopted as a standard for conservation practice.

2. Significant archaeological sites are recognised in policies and plans in order to promote the sustainable management of these sites in conjunction with the archaeological authority provisions of the Historic Places Act 1993.

3. Protocols are developed for:
- protecting knowledge of the particular location of sites of significance to tangata whenua; and
- the use of this information by public authorities and third parties.

Planning for heritage protection

1. Cultural heritage strategies are prepared to provide for the identification, protection, conservation and promotion of historic and cultural heritage.

2. Historic and cultural heritage is identified and assessed, and the effectiveness of policies and plans are monitored, by gathering information and undertaking research which is systematic, objective, and based on agreed criteria.

3. Local authorities recognise that primary responsibility for identifying and assessing Maori heritage values rests with tangata whenua.

4. High-quality heritage inventories are established and maintained and are easily accessed (where culturally appropriate) to enable the use of the information during resource consent and building consent processes.

5. Significant heritage areas, places and objects are identified in district plans and given an appropriate level of protection by associated rules.

6. Tangata whenua are assisted to develop their own planning documents to protect sites of significance to tangata whenua and regional and district plans have regard to such documents.

7. Conservation plans are prepared to identify the heritage value of significant places and provide for appropriate conservation measures.

8. Local funds are provided for the acquisition of heritage places, the lodging of heritage orders, or the protection of heritage through the purchase and resale of places with suitable protection covenants.

Resource consent procedures

9. Early contact between applicants for resource consents and council staff occurs and is encouraged; and written background information and guidance on the identification and assessment of historic and cultural heritage is provided with resource consent application forms.

10. Resource consent applications affecting historic and cultural heritage are accompanied by an assessment of environmental effects including a description of the heritage resource, an assessment of heritage values, and an evaluation of the effect of the proposal on those values.

11. The processing of resource consents ensures that the adverse effects of proposed activities on historic and cultural heritage values are avoided, remedied or mitigated.

12. Technical consultants are retained to review aspects of historic and cultural heritage management where insufficient expertise is available among council staff.

Assistance to owners of historic and cultural heritage

13. A partnership approach between councils, landowners, businesses and heritage trusts is developed to provide for the protection of significant historic and cultural heritage.

14. Financial and technical assistance for the investigation of alternative options to demolition is provided for earthquake-prone heritage buildings.

15. Expert heritage conservation advice is provided about protection approaches, alternative uses, and appropriate designs to assist the recognition and protection of heritage.

16. Financial incentives such as rates relief, assistance funds, and the waiver of consent fees are provided to landowners in recognition of the potential financial burden for listed heritage places.

These suggested "good practices" were identified from research undertaken for the report by the Parliamentary Commissioner for the Environment entitled *Historic and Cultural Heritage Management in New Zealand* (1996).

The New Zealand Historic Places Trust *Cultural Heritage Planning Manual* (1994) is also recommended for those seeking further information and guidance on historic and cultural heritage and district planning.

ICOMOS New Zealand Charter for the Conservation of Places of Cultural Heritage Value Revised 2010

Preamble

New Zealand retains a unique assemblage of places of cultural heritage value relating to its indigenous and more recent peoples. These areas, cultural landscapes and features, buildings and structures, gardens, archaeological sites, traditional sites, monuments, and sacred places are treasures of distinctive value that have accrued meanings over time. New Zealand shares a general responsibility with the rest of humanity to safeguard its cultural heritage places for present and future generations. More specifically, the people of New Zealand have particular ways of perceiving, relating to, and conserving their cultural heritage places.

Following the spirit of the International Charter for the Conservation and Restoration of Monuments and Sites (the Venice Charter - 1964), this charter sets out principles to guide the conservation of places of cultural heritage value in New Zealand. It is a statement of professional principles for members of ICOMOS New Zealand.

This charter is also intended to guide all those involved in the various aspects of conservation work, including owners, guardians, managers, developers, planners, architects, engineers, craftspeople and those in the construction trades, heritage practitioners and advisors, and local and central government authorities. It offers guidance for communities, organisations, and individuals involved with the conservation and management of cultural heritage places.

This charter should be made an integral part of statutory or regulatory heritage management policies or plans, and should provide support for decision makers in statutory or regulatory processes.

Each article of this charter must be read in the light of all the others. Words in bold in the text are defined in the definitions section of this charter.

This revised charter was adopted by the New Zealand National Committee of the International Council on Monuments and Sites at its meeting on 4 September 2010.

Purpose of conservation

1. The purpose of conservation

The purpose of conservation is to care for places of cultural heritage value.

In general, such places:

(i) have lasting values and can be appreciated in their own right;

(ii) inform us about the past and the cultures of those who came before us;

(iii) provide tangible evidence of the continuity between past, present, and future;

(iv) underpin and reinforce community identity and relationships to ancestors and the land;

and

(v) provide a measure against which the achievements of the present can be compared.

It is the purpose of conservation to retain and reveal such values, and to support the ongoing meanings and functions of places of cultural heritage value, in the interests of present and future generations.

2. Understanding cultural heritage value

Conservation of a place should be based on an understanding and appreciation of all aspects of its cultural heritage value, both tangible and intangible. All available forms of knowledge and evidence provide the means of understanding a place

and its cultural heritage value and cultural heritage significance. Cultural heritage value should be understood through consultation with connected people, systematic documentary and oral research, physical investigation and recording of the place, and other relevant methods.

All relevant cultural heritage values should be recognised, respected, and, where appropriate, revealed, including values which differ, conflict, or compete.

The policy for managing all aspects of a place, including its conservation and its use, and the implementation of the policy, must be based on an understanding of its cultural heritage value.

3. Indigenous cultural heritage

The indigenous cultural heritage of tangata whenua relates to whanau, hapu, and iwi groups. It shapes identity and enhances well-being, and it has particular cultural meanings and values for the present, and associations with those who have gone before. Indigenous cultural heritage brings with it responsibilities of guardianship and the practical application and passing on of associated knowledge, traditional skills, and practices.

The Treaty of Waitangi is the founding document of our nation. Article 2 of the Treaty recognises and guarantees the protection of tino rangatiratanga, and so empowers kaitiakitanga as customary trusteeship to be exercised by tangata whenua. This customary trusteeship is exercised over their taonga, such as sacred and traditional places, built heritage, traditional practices, and other cultural heritage resources. This obligation extends beyond current legal ownership wherever such cultural heritage exists.

Particular matauranga, or knowledge of cultural heritage meaning, value, and practice, is associated with places. Matauranga is sustained and transmitted through oral, written, and physical forms determined by tangata whenua. The conservation of such places is therefore conditional on decisions made in associated tangata whenua communities, and should proceed only in this context. In particular, protocols of access, authority, ritual, and practice are determined at a local level and should be respected.

4. Planning for conservation

Conservation should be subject to prior documented assessment and planning.

All conservation work should be based on a conservation plan which identifies the cultural heritage value and cultural heritage significance of the place, the conservation policies, and the extent of the recommended works.

The conservation plan should give the highest priority to the authenticity and integrity of the place.

Other guiding documents such as, but not limited to, management plans, cyclical maintenance plans, specifications for conservation work, interpretation plans, risk mitigation plans, or emergency plans should be guided by a conservation plan.

5. Respect for surviving evidence and knowledge

Conservation maintains and reveals the authenticity and integrity of a place, and involves the least possible loss of fabric or evidence of cultural heritage value. Respect for all forms of knowledge and existing evidence, of both tangible and intangible values, is essential to the authenticity and integrity of the place.

Conservation recognises the evidence of time and the contributions of all periods. The conservation of a place should identify and respect all aspects of its cultural heritage value without unwarranted emphasis on any one value at the expense of others.

The removal or obscuring of any physical evidence of any period or activity should be minimised, and should be explicitly justified where it does occur. The fabric of a particular period or activity may be obscured or removed if assessment shows that its removal would not diminish the cultural heritage value of the place.

In conservation, evidence of the functions and intangible meanings of places of cultural heritage value should be respected.

6. Minimum intervention

Work undertaken at a place of cultural heritage value should involve the least degree of intervention consistent with conservation and the principles of this charter.

Intervention should be the minimum necessary to ensure the retention of tangible and intangible values and the continuation of uses integral to those values. The removal of fabric or the alteration of features and spaces that have cultural heritage value should be avoided.

7. Physical investigation

Physical investigation of a place provides primary evidence that cannot be gained from any other source. Physical investigation should be carried out according to currently accepted professional standards, and should be documented through systematic recording.

Invasive investigation of fabric of any period should be carried out only where knowledge may be significantly extended, or where it is necessary to establish the existence of fabric of cultural heritage value, or where it is necessary for conservation work, or where such fabric is about to be damaged or destroyed or made inaccessible. The extent of invasive investigation should minimise the disturbance of significant fabric.

8. Use

The conservation of a place of cultural heritage value is usually facilitated by the place serving a useful purpose.

Where the use of a place is integral to its cultural heritage value, that use should be retained.

Where a change of use is proposed, the new use should be compatible with the cultural heritage value of the place, and should have little or no adverse effect on the cultural heritage value.

9. Setting

Where the setting of a place is integral to its cultural heritage value, that setting should be conserved with the place itself. If the setting no longer contributes to the cultural heritage value of the place, and if reconstruction of the setting can be justified, any reconstruction of the setting should be based on an understanding of all aspects of the cultural heritage value of the place.

10. Relocation

The on-going association of a structure or feature of cultural heritage value with its location, site, curtilage, and setting is essential to its authenticity and integrity. Therefore, a structure or feature of cultural heritage value should remain on its original site.

Relocation of a structure or feature of cultural heritage value, where its removal is required in order to clear its site for a different purpose or construction, or where its removal is required to enable its use on a different site, is not a desirable outcome and is not a conservation process.

In exceptional circumstances, a structure of cultural heritage value may be relocated if its current site is in imminent danger, and if all other means of retaining the structure in its current location have been exhausted. In this event, the new location should provide a setting compatible with the cultural heritage value of the structure.

11. Documentation and archiving

The cultural heritage value and cultural heritage significance of a place, and all aspects of its conservation, should be fully documented to ensure that this information is available to present and future generations.

Documentation includes information about all changes to the place and any decisions made during the conservation process.

Documentation should be carried out to archival standards to maximise the longevity of the record, and should be placed in an appropriate archival repository.

Documentation should be made available to connected people and other interested parties. Where reasons for confidentiality exist, such as security, privacy, or cultural appropriateness, some information may not always be publicly accessible.

12. Recording

Evidence provided by the fabric of a place should be identified and understood through systematic

research, recording, and analysis.

Recording is an essential part of the physical investigation of a place. It informs and guides the conservation process and its planning. Systematic recording should occur prior to, during, and following any intervention. It should include the recording of new evidence revealed, and any fabric obscured or removed.

Recording of the changes to a place should continue throughout its life.

13. Fixtures, fittings, and contents

Fixtures, fittings, and contents that are integral to the cultural heritage value of a place should be retained and conserved with the place. Such fixtures, fittings, and contents may include carving, painting, weaving, stained glass, wallpaper, surface decoration, works of art, equipment and machinery, furniture, and personal belongings.

Conservation of any such material should involve specialist conservation expertise appropriate to the material. Where it is necessary to remove any such material, it should be recorded, retained, and protected, until such time as it can be reinstated.

Conservation processes and practice

14. Conservation plans

A conservation plan, based on the principles of this charter, should:

(i) be based on a comprehensive understanding of the cultural heritage value of the place and assessment of its cultural heritage significance;

(ii) include an assessment of the fabric of the place, and its condition;

(iii) give the highest priority to the authenticity and integrity of the place;

(iv) include the entirety of the place, including the setting;

(v) be prepared by objective professionals in appropriate disciplines;

(vi) consider the needs, abilities, and resources of connected people;

(vii) not be influenced by prior expectations of change or development;

(viii) specify conservation policies to guide decision making and to guide any work to be undertaken;

(ix) make recommendations for the conservation of the place; and

(x) be regularly revised and kept up to date.

15. Conservation projects

Conservation projects should include the following:

(i) consultation with interested parties and connected people, continuing throughout the project;

(ii) opportunities for interested parties and connected people to contribute to and participate in the project;

(iii) research into documentary and oral history, using all relevant sources and repositories of knowledge;

(iv) physical investigation of the place as appropriate;

(v) use of all appropriate methods of recording, such as written, drawn, and photographic;

(vi) the preparation of a conservation plan which meets the principles of this charter;

(vii) guidance on appropriate use of the place;

(viii) the implementation of any planned conservation work; (ix) the documentation of the conservation work as it proceeds; and

(x) where appropriate, the deposit of all records in an archival repository.

A conservation project must not be commenced until any required statutory authorisation has been granted.

16. Professional, trade, and craft skills

All aspects of conservation work should be planned, directed, supervised, and undertaken by people with appropriate conservation training and experience directly relevant to the project.

All conservation disciplines, arts, crafts, trades, and traditional skills and practices that are relevant to the project should be applied and promoted.

17. Degrees of intervention for conservation purposes

Following research, recording, assessment, and planning, intervention for conservation purposes may include, in increasing degrees of intervention:

(i) preservation, through stabilisation, maintenance, or repair;

(ii) restoration, through reassembly, reinstatement, or removal;

(iii) reconstruction; and (iv) adaptation.

In many conservation projects a range of processes may be utilised. Where appropriate, conservation processes may be applied to individual parts or components of a place of cultural heritage value.

The extent of any intervention for conservation purposes should be guided by the cultural heritage value of a place and the policies for its management as identified in a conservation plan. Any intervention which would reduce or compromise cultural heritage value is undesirable and should not occur.

Preference should be given to the least degree of intervention, consistent with this charter.

Re-creation, meaning the conjectural reconstruction of a structure or place; replication, meaning to make a copy of an existing or former structure or place; or the construction of generalised representations of typical features or structures, are not conservation processes and are outside the scope of this charter.

18. Preservation

Preservation of a place involves as little intervention as possible, to ensure its long-term survival and the continuation of its cultural heritage value.

Preservation processes should not obscure or remove the patina of age, particularly where it contributes to the authenticity and integrity of the place, or where it contributes to the structural stability of materials.

i. Stabilisation

Processes of decay should be slowed by providing treatment or support.

ii. Maintenance

A place of cultural heritage value should be maintained regularly. Maintenance should be carried out according to a plan or work programme.

iii. Repair

Repair of a place of cultural heritage value should utilise matching or similar materials. Where it is necessary to employ new materials, they should be distinguishable by experts, and should be documented.

Traditional methods and materials should be given preference in conservation work.

Repair of a technically higher standard than that achieved with the existing materials or construction practices may be justified only where the stability or life expectancy of the site or material is increased, where the new material is compatible with the old, and where the cultural heritage value is not diminished.

19. Restoration

The process of restoration typically involves reassembly and reinstatement, and may involve the removal of accretions that detract from the cultural heritage value of a place.

Restoration is based on respect for existing fabric, and on the identification and analysis of all available evidence, so that the cultural heritage value of a place is recovered or revealed. Restoration should be carried out only if the cultural heritage value of the place is recovered or revealed by the process.

Restoration does not involve conjecture.

i. Reassembly and reinstatement

Reassembly uses existing material and, through the process of reinstatement, returns it to its former position. Reassembly is more likely to involve work on part of a place rather than the whole place.

ii. Removal

Occasionally, existing fabric may need to be permanently removed from a place. This may be for reasons of advanced decay, or loss of structural integrity, or because particular fabric has been identified in a conservation plan as detracting from the cultural heritage value of the place.

The fabric removed should be systematically recorded before and during its removal. In some cases it may be appropriate to store, on a long-term basis, material of evidential value that has been removed.

20. Reconstruction

Reconstruction is distinguished from restoration by the introduction of new material to replace material that has been lost.

Reconstruction is appropriate if it is essential to the function, integrity, intangible value, or understanding of a place, if sufficient physical and documentary evidence exists to minimise conjecture, and if surviving cultural heritage value is preserved.

Reconstructed elements should not usually constitute the majority of a place or structure.

21. Adaptation

The conservation of a place of cultural heritage value is usually facilitated by the place serving a useful purpose. Proposals for adaptation of a place may arise from maintaining its continuing use, or from a proposed change of use.

Alterations and additions may be acceptable where they are necessary for a compatible use of the place. Any change should be the minimum necessary, should be substantially reversible, and should have little or no adverse effect on the cultural heritage value of the place.

Any alterations or additions should be compatible with the original form and fabric of the place, and should avoid inappropriate or incompatible contrasts of form, scale, mass, colour, and material. Adaptation should not dominate or substantially obscure the original form and fabric, and should not adversely affect the setting of a place of cultural heritage value. New work should complement the original form and fabric.

22. Non-intervention

In some circumstances, assessment of the cultural heritage value of a place may show that it is not desirable to undertake any conservation intervention at that time. This approach may be appropriate where undisturbed constancy of intangible values, such as the spiritual associations of a sacred place, may be more important than its physical attributes.

23. Interpretation

Interpretation actively enhances public understanding of all aspects of places of cultural heritage value and their conservation. Relevant cultural protocols are integral to that understanding, and should be identified and observed.

Where appropriate, interpretation should assist the understanding of tangible and intangible values of a place which may not be readily perceived, such as the sequence of construction and change, and the meanings and associations of the place for connected people.

Any interpretation should respect the cultural heritage value of a place. Interpretation methods should be appropriate to the place. Physical interventions for interpretation purposes should not detract from the experience of the place, and should not have an adverse effect on its tangible or intangible values.

24. Risk mitigation

Places of cultural heritage value may be vulnerable to natural disasters such as flood, storm, or earthquake; or to humanly induced threats and risks such as those arising from earthworks, subdivision and development, buildings works, or wilful damage or neglect. In order to safeguard cultural heritage value, planning for risk mitigation and emergency management is necessary.

Potential risks to any place of cultural heritage value should be assessed. Where appropriate, a risk mitigation plan, an emergency plan, and/or a protection plan should be prepared, and implemented as far as possible, with reference to a conservation plan.

Definitions

For the purposes of this charter:

Adaptation means the process(es) of modifying a place for a compatible use while retaining its cultural heritage value. Adaptation processes include alteration and addition.

Authenticity means the credibility or truthfulness of the surviving evidence and knowledge of the cultural heritage value of a place.

Relevant evidence includes form and design, substance and fabric, technology and craftsmanship, location and surroundings, context and setting, use and function, traditions, spiritual essence, and sense of place, and includes tangible and intangible values.

Assessment of authenticity is based on identification and analysis of relevant evidence and knowledge, and respect for its cultural context.

Compatible use means a use which is consistent with the cultural heritage value of a place, and which has little or no adverse impact on its authenticity and integrity.

Connected people means any groups, organisations, or individuals having a sense of association with or responsibility for a place of cultural heritage value.

Conservation means all the processes of understanding and caring for a place so as to safeguard its cultural heritage value. Conservation is based on respect for the existing fabric, associations, meanings, and use of the place. It requires a cautious approach of doing as much work as necessary but as little as possible, and retaining authenticity and integrity, to ensure that the place and its values are passed on to future generations.

Conservation plan means an objective report which documents the history, fabric, and cultural heritage value of a place, assesses its cultural heritage significance, describes the condition of the place, outlines conservation policies for managing the place, and makes recommendations for the conservation of the place.

Contents means moveable objects, collections, chattels, documents, works of art, and ephemera that are not fixed or fitted to a place, and which have been assessed as being integral to its cultural heritage value.

Cultural heritage significance means the cultural heritage value of a place relative to other similar or comparable places, recognising the particular cultural context of the place.

Cultural heritage value/s means possessing aesthetic, archaeological, architectural, commemorative, functional, historical, landscape, monumental, scientific, social, spiritual, symbolic, technological, traditional, or other tangible or intangible values, associated with human activity.

Cultural landscapes means an area possessing cultural heritage value arising from the relationships between people and the environment. Cultural landscapes may have been designed, such as gardens, or may have evolved from human settlement and land use over time, resulting in a diversity of distinctive landscapes in different areas. Associative cultural landscapes, such as sacred mountains, may lack tangible cultural elements but may have strong intangible cultural or spiritual associations.

Documentation means collecting, recording, keeping, and managing information about a place and its cultural heritage value, including information about its history, fabric, and meaning; information about decisions taken; and information about physical changes and interventions made to the place.

Fabric means all the physical material of a place, including subsurface material, structures, and interior and exterior surfaces including the patina of age; and including fixtures and fittings, and gardens and plantings.

Hapu means a section of a large tribe of the tangata whenua.

Intangible value means the abstract cultural heritage value of the meanings or associations of a place, including commemorative, historical, social, spiritual, symbolic, or traditional values.

Integrity means the wholeness or intactness of a place, including its meaning and sense of place, and all the tangible and intangible attributes and elements necessary to express its cultural heritage value.

Intervention means any activity that causes disturbance of or alteration to a place or its fabric. Intervention includes archaeological excavation, invasive investigation of built structures, and any intervention for conservation purposes.

Iwi means a tribe of the tangata whenua.

Kaitiakitanga means the duty of customary trusteeship, stewardship, guardianship, and protection of land, resources, or taonga.

Maintenance means regular and on-going protective care of a place to prevent deterioration and to retain its cultural heritage value.

Matauranga means traditional or cultural knowledge of the tangata whenua.

Non-intervention means to choose not to undertake any activity that causes disturbance of or alteration to a place or its fabric.

Place means any land having cultural heritage value in New Zealand, including areas; cultural landscapes; buildings, structures, and monuments; groups of buildings, structures, or monuments; gardens and plantings; archaeological sites

and features; traditional sites; sacred places; townscapes and streetscapes; and settlements. Place may also include land covered by water, and any body of water. Place includes the setting of any such place.

Preservation means to maintain a place with as little change as possible.

Reassembly means to put existing but disarticulated parts of a structure back together.

Reconstruction means to build again as closely as possible to a documented earlier form, using new materials.

Recording means the process of capturing information and creating an archival record of the fabric and setting of a place, including its configuration, condition, use, and change over time.

Reinstatement means to put material components of a place, including the products of reassembly, back in position.

Repair means to make good decayed or damaged fabric using identical, closely similar, or otherwise appropriate material.

Restoration means to return a place to a known earlier form, by reassembly and reinstatement, and/or by removal of elements that detract from its cultural heritage value.

Setting means the area around and/or adjacent to a place of cultural heritage value that is integral to its function, meaning, and relationships. Setting includes the structures, outbuildings, features, gardens, curtilage, airspace, and accessways forming the spatial context of the place or used in association with the place. Setting also includes cultural landscapes, townscapes, and streetscapes; perspectives, views, and viewshafts to and from a place; and relationships with other places which contribute to the cultural heritage value of the place. Setting may extend beyond the area defined by legal title, and may include a buffer zone necessary for the longterm protection of the cultural heritage value of the place.

Stabilisation means the arrest or slowing of the processes of decay.

Structure means any building, standing remains, equipment, device, or other facility made by people and which is fixed to the land.

Tangata whenua means generally the original indigenous inhabitants of the land; and means specifically the people exercising kaitiakitanga over particular land, resources, or taonga.

Tangible value means the physically observable cultural heritage value of a place, including archaeological, architectural, landscape, monumental, scientific, or technological values.

Taonga means anything highly prized for its cultural, economic, historical, spiritual, or traditional value, including land and natural and cultural resources.

Tino rangatiratanga means the exercise of full chieftainship, authority, and responsibility.

Use means the functions of a place, and the activities and practices that may occur at the place. The functions, activities, and practices may in themselves be of cultural heritage value.

Whanau means an extended family which is part of a hapu or iwi.

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Formatting must remain unaltered. Parts of the ICOMOS New Zealand Charter may be quoted with appropriate citing and acknowledgement.

This revised text replaces the 1993 and 1995 versions and should be referenced as the ICOMOS New Zealand Charter for the Conservation of Places of Cultural Heritage Value (ICOMOS New Zealand Charter 2010).

This revision incorporates changes in conservation philosophy and best practice since 1993 and is the only version of the ICOMOS New Zealand Charter approved by ICOMOS New Zealand (Inc.) for use.

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Project Number #19377.000.002

Combined Preliminary and Detailed Site Investigation

Water Race Hill, Lot 4 Terrace Street, Bannockburn

Submitted to:
DJ Jones Family Trust & NR Searell Trust No 2
147 Cavendish Road
Casebrook
Christchurch 8051

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Appendix 3: Soil Analysis Results

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1 Introduction

ENGEO Ltd was requested by DJ Jones Family Trust & NR Searell Trust No 2 to undertake a combined preliminary and detailed site investigation (PSI) and Detailed Site Investigation (DSI) of the property at Water Race Hill, Lot 4 Terrace Street, Bannockburn (herein referred to as 'the site'). This work has been carried out in accordance with our signed agreement dated 15 September 2021. The purpose of the assessment was to determine if the site may potentially have been subject to land uses in the past or is currently subject to land uses that are included on the Hazardous Activities and Industries List (HAIL) and therefore is deemed to be a "piece of land" in terms of the NES: CS. Appendix 1 shows the layout of the site.

If an activity included on the Ministry for the Environment (MfE) Hazardous Activities and Industries List (HAIL) has occurred on the site, under the NES regulations, there is a requirement for a contaminated land investigation prior to site disturbance or redevelopment. ENGEO understands that the following HAIL activities may have historically been associated with the site:

- E7: Mining industries (excluding gravel extraction) including exposure of faces or release of groundwater containing hazardous contaminants, or the storage of hazardous wastes including waste dumps or dam tailings.

Given the identification of this potentially hazardous activity on-site, further intrusive works were required to assess if the site is suitable for the proposed end land use.

This PSI / DSI was undertaken in general accordance with the MfE 2021 Contaminated Land Management Guidelines (CLMG) No.5: Guidelines for Site Investigation and Site Analysis of Soil and reported in general accordance with the MfE 2021 CLMG No.1: Reporting on Contaminated Sites in New Zealand..

1.1 Objectives of the Assessment

The objectives of this assessment was to:

- Evaluate and identify conditions of releases and threatened releases of hazardous substances on, at, in or to the subject property;
- Evaluate the presence and extent of identified contaminants of concern (COC) at the site; and
- Assess whether the COCs pose an unacceptable risk to human health or the environment during and post site works.

1.2 Approach

To satisfy the objectives, ENGEO sought to gather information regarding the following:

- Current and past property uses and occupiers;
- Current and past users of hazardous substances;
- Waste management and disposal activities that could have caused a release or threatened release of hazardous substances;

- Current and past corrective actions and response activities to address past and on-going releases of hazardous substances at the subject property;
- Properties adjoining or located near the subject property that have environmental conditions that could have resulted in conditions indicative of releases or threatened releases of hazardous substances to the subject property; and
- COC concentrations within the soils underlying the site.

1.2.1 Review of Site Information

During this assessment, a number of sources of information were used to gather information relating to the site regarding its past and present uses. This included the Otago Regional Council (ORC) HAIL database to determine if the site has a known activity included on the HAIL and reviewing records held by CODC including the property file. A review of a number of historical and current aerial photographs was also undertaken using images from RetroLens and Google Earth.

In addition to the above existing reports associated with the Resource Consent application were also reviewed (Section 3.1).

1.2.2 Site Inspection

A site walkover was undertaken on 28 September 2021 by Gareth Ward of ENGEO. Objective evidence was collected through observations of activities and conditions present at the site.

2 Site Description and Setting

Site information is summarised in Table 1.

Table 1: Site Information

Item	Description
Location	Terrace Street, Bannockburn
Legal Description	Lot 4 DP 339137
Property Owner	DJ Jones Family Trust & NR Searell Trust No 2
Current Land Use	Bare Land / Grazing
Proposed Land Use	Subdivision
Territorial Authority	Central Otago District Council
Zoning	Residential Resource Area 4

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The site setting is summarised in Table 2.

Table 2: Site Setting

Item	Description
Topography	The area demarcated for subdivision forms a flat plateau dropping steeply to the north towards Clutha River, east towards Bannockburn inlet and Shepherd's Creek and west towards Revell's Gully. The site shows evidence of former gold mining activities such as water races and areas are deeply incised with sluice faces and channels.
Local Setting	The site is located at the eastern end of Terrace Street which contains residential properties. The site itself is rural in character set in a combination of grazing land, visitor amenities by the Clutha River and vineyards to the north, east and west.
Nearest Surface Water & Use	No surface water was observed on-site but visual evidence and vegetation indicates that water does seep down "Pennyweight Sluicings" at the north-western edge of the site into a stream at the base of Revell's Gully approximately 100 m north of the site. Bannockburn Inlet is approximately 200 m northeast of the site and is used for recreational purposes. Shepherd's Creek is approximately 200 m east of the site. The Clutha River is approximately 700 m north of the site.
Geology	The site is underlain by sandy gravels to a depth of 3 m.
Groundwater Abstractions	No groundwater abstractions are located on the site.
Discharge Consents	There are no discharge consents located on the site.

Table 3: Current Site Conditions

Site Condition	Comments
Surface Water Appearance	No surface water present on-site.
Local Sensitive Environments	Clutha River towards the north, Bannockburn inlet and Shepherd's Creek towards the east and Revell's Gully towards the west. Residential properties on Terrace Road border the site to the west.
Visible Signs of Plant Stress	No visible signs of plant stress observed on-site.
Potential for on- or off-Site Migration of Contaminants	Site topography slopes steeply to the north, east and west towards water courses. Evidence of surface water runoff northwards down "Pennyweight Sluicings" at the north-western edge of the site into a stream at the base of Revell's Gully.

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3 Site History

A number of sources were used to investigate the past uses of the site. The findings of these information searches have been summarised in this section.

3.1 Central Otago District Council Property File Review

The property file for the site has been requested from CODC. Due to COVID-19 related delays the Property file is not currently available while it is being digitised. The file will be reviewed when available and any necessary amendments to this report will be made at that time.

However, ENGEO has reviewed the recent Resource Consent application and additional reports submitted by DJ Jones Family Trust & NR Searell Trust No 2. The reports appended to the application include:

- Appendix A: Updated Subdivision Design Plans; and
- Appendix D: Heritage Impact Assessment.

This Consent was Publically Notified by CODC on 10 June 2021 and is currently on hold pending further reports.

The Resource Consent application contains information regarding the historic land use at the site. The findings from these reports are summarised in Section 3.3.

3.2 Otago Regional Council HAIL database

Otago Regional Council maintains a HAIL (Hazardous Activities and Industries List) database of properties where information is held regarding current or past land-uses that have the potential to contaminate land.

The site is not recorded on the ORC database as a site containing an activity included on the HAIL.

3.3 Kopuwai Consulting - Archaeological and Heritage Impact Assessment

Kopuwai Consulting undertook an archaeological and heritage impact assessment of the proposed development in May 2021 as part of the resource consent process.

The Archaeological and Heritage Impact Assessment Report shows that:

“The site contains a significant and diverse array of recorded archaeological sites and features associated with early 1860’s goldmining, early main street stable site, commonage ground and coalmining through to the 1930’s involving several water races, reservoirs, various sluicing’s off respective creek terraces and gullies.”

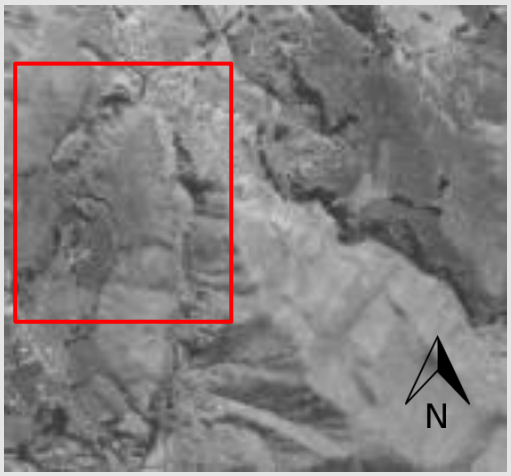
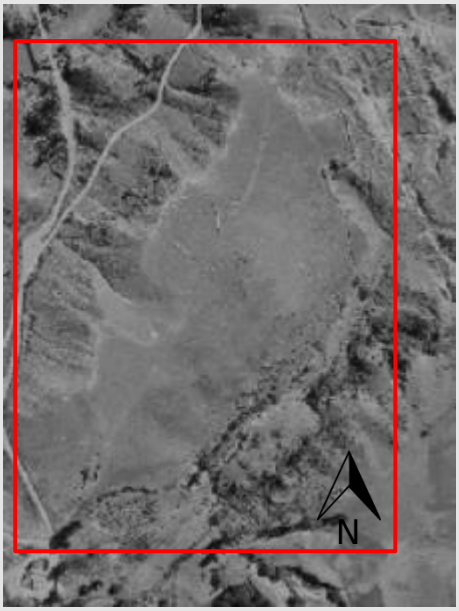
3.4 Historical Aerial Photograph Review

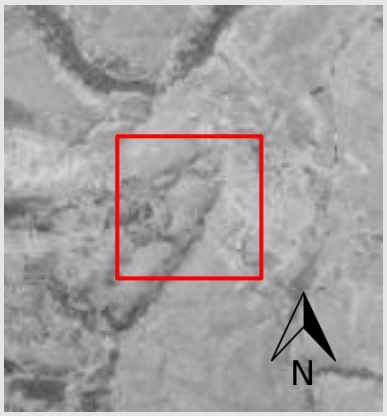
Aerial photographs dating from 1958 to 2013 have been reviewed from the QLDC Historic Imagery GIS layer and RetroLens.

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The relevant visible features are summarised in Table 4

Table 4: Aerial Photographs

Date	Description	Image
1958 RetroLens	Small scale image. Not possible to identify land use.	
1974 (Source: retrolens.nz)	Site appears to be pastoral land.	

Date	Description	Image
1983 (Source: retrolens.nz)	Small scale image. Not possible to positively identify land use but appears to be pastoral land.	
2013 (Source: Google Earth)	Site appears to be pastoral land. Residential development on Terrace Street is now visible in southwest corner of the site.	
2018 (Source: Google Earth)	Site appears to be pastoral land. Residential development in the southwest.	

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4 Current Site Conditions

A site inspection was undertaken on 28 September 2021 by Gareth Ward of ENGEO. Objective evidence was collected through observations of activities and conditions present at the site. The information gathered is summarised in

Table 5. Photographs taken during the inspection are included in Appendix 2.

Table 5: Current Site Conditions

Site Condition	Comments
Visible signs of contamination	No visible signs of contamination were observed during the time of the site walkover.
Surface water appearance	No surface water present on-site.
Current surrounding land use	The site is located at the eastern end of Terrace Street which contains residential properties. The site itself is rural in character set in a combination of grazing land, visitor amenities by the Clutha River and vineyards to the north, east and west.
Local sensitive environments	Clutha River towards the north, Bannockburn inlet and Shepherd's Creek towards the east and Revell's Gully towards the west. Residential properties on Terrace Road border the site to the west.
Visible signs of plant stress	No visible signs of plant stress were noted during the site walkover.
Potential for on or off site migration of contaminants	Site topography slopes steeply to the north, east and west towards water courses. Evidence of runoff northwards down "Pennyweight Sluicings" at the north-western edge of the site into a stream at the base of Revell's Gully.
Ground Cover	The site is currently grassed with evidence of rabbit activity
Additional observations	The site bares evidence of former gold mining activities such as water races and areas are deeply incised with sluice faces and channels. Including "Pennyweight Sluicings" at north-western edge of the site. No evidence of former goldmining activities were observed on the proposed development site.

5 Potential HAIL Activities

Activities included on the Hazardous Activities and Industries List (HAIL) trigger the requirement for a contaminated land investigation prior to development. The following HAIL activities have been identified either at the site or have historically been present at the site:

- E7: Mining industries (excluding gravel extraction) including exposure of faces or release of groundwater containing hazardous contaminants, or the storage of hazardous wastes including waste dumps or dam tailings.

6 Summary of Preliminary Site Investigation

Potential sources of contamination at the site were assessed and it was determined that the site was used for agricultural purposes prior to it being used as sports turf. The information is summarised in Table 6.

Table 6: Potential Contaminants at the Site

Potential Source of Contamination	Contaminants of Concern	Possible Extent of Contamination	HAIL Activity as defined by the NES (soil)
Historic Gold Mining	Heavy metals	Across the site	E7: Mining Activities

Although the site is associated with historic gold mining there is no evidence of active mining on the proposed development site itself. The historic water race channels on the site are believed to have carried water used in sluicing areas such as the “Pennyweight Sluicings” at the north-western edge of the site. These water races and sluicing operations are unlikely to have required the use of contaminative materials.

7 Intrusive Investigation

Based on the review of the historical site uses, the Contaminants of Concern (COC) identified as part of this investigation were heavy metals from historic mining activities. The environmental investigations ran concurrently with the geotechnical investigations and made use of the geotechnical test pits to obtain samples from locations across the site. A total of 10 samples were taken across the site (Appendix 1 attached).

7.1 Field Work Methodology

The following fieldwork methodology was undertaken:

- Collection of 10 samples in natural ground from the geotechnical test pits (Appendix 1). Two additional samples were scheduled to be taken however samples were not taken from test pits WRH-ENG21-TP02 as this was situated on Lot 18 of the proposed development and was too steep to safely excavate the test pit or from WRH-ENG21-TP03 on Lot 16 as this Lot is rock with no overburden.

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- All soil samples collected were placed in jars supplied by RJ Hill Laboratories (Hills), which were then capped, labelled with a unique identifier and placed in chilled containers (chilly bins) prior to transportation to the laboratory. Samples were transported to Hills under standard ENGEO chain of custody documentation.
- To reduce the potential for cross-contamination, each sample was collected using disposable nitrile gloves that were discarded following the collection of each sample.
- After the collection of each sample, the sampling equipment was decontaminated by washing with a solution of Decon90 and rinsing with tap water followed by deionised water.
- The intrusive samples were completed in accordance with ENGEO standard operating procedures with logging completed in general accordance with the New Zealand Geotechnical Society Inc. 'Guidelines for the Field Classification of Soil and Rock for Engineering Purposes' December 2005.
- All fieldwork and sampling was completed in general accordance with the procedures for the appropriate handling of potentially contaminated soils as described in the MfE *Contaminated Land Management Guidelines No.5: Site Investigation and Analysis of Soils*.
- Samples were collected from a hand trowel at each location and inspected for visual and olfactory indicators of contamination.
- Following receipt of the samples by Hills, the soil samples were scheduled for analysis of the identified contaminants of concern – heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc).

7.2 Quality Assurance and Quality Control

The quality assurance / quality control (QA / QC) procedures employed during the works included:

- Standard sample registers and chain of custody records have been kept for all samples.
- The use of Hills who have certification through the International Accreditation New Zealand (IANZ). To maintain their accreditation, Hills undertakes rigorous cross checking and routine duplicate sample testing to ensure the accuracy of their results.
- During the site investigation, every attempt was made to ensure that cross contamination did not occur through the use of procedures outlined within this document.

8 Regulatory Framework and Assessment Criteria

8.1 NES

The Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NES) came into effect on 1 January 2012 (MfE, 2011).

The NES introduced soil contaminant standards (SCSs) for 12 priority contaminants for the protection of human health under a variety of land use scenarios.

The NES requires the *Contaminated Land Management Guidelines No.2: Hierarchy and Application in New Zealand of Environmental Guideline Values* be used where a NES SCS is not available. The NES does not consider environmental receptors; accordingly, the application of guidelines relevant to environmental receptors shall be implemented according to the MfE CLMG No.2 and relevant rules in the regional plan.

8.2 Otago Regional Plan – Chapter 5 Contaminated Sites

The Otago Regional Plan considers the discharge of hazardous substances or wastes onto or into land or water, and issues associated with remedying or mitigating the adverse effects of those contaminated discharges.

The Otago Regional Plan references in Section 5.5.2(c) the ANZECC "Guidelines for Assessment and Management of Contaminated Sites" (January 1992) as the screening assessment recommended to be used. As this document has been superseded, and in line with the RMA in New Zealand, we have used the NES as the initial screening assessment guidelines and other international guidelines where the NES does not list the contaminant, as per CLMG No.2.

8.3 Disposal Criteria

An assessment of potential off-site disposal options for excess soil generated during site development works has been conducted. Dependent on the contamination conditions of the spoil, off-site disposal options range from disposal to "cleanfill" sites to managed waste sites. As outlined in the publication Waste Management Institute of New Zealand Technical Guidelines for Disposal to Land (August 2018) the definition of cleanfill states:

"Virgin excavated natural materials (VENM) such as clay, soil and rock that are free of:

- Combustible, putrescible, degradable or leachable components;
- Hazardous substances or material (such as municipal solid waste) likely to create leachate by means of biological breakdown;
- Products or materials derived from hazardous waste treatment, stabilisation or disposal practices;
- Materials such as medical and veterinary waste, asbestos or radioactive substances that may present a risk to human health if excavated;
- Contaminated soil and other contaminated materials; and
- Liquid waste."

8.4 Assessment Criteria

Contaminant concentrations in soil were compared against background levels (obtained from LINZ) and to human health criteria based on two land uses:

- Residential land use criteria (used for future land use);
- Recreational land use criteria (used for a proposed network of footpaths); and

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- Commercial / Industrial land use (based on an outdoor worker scenario) (for redevelopment workers).

The land use scenarios are relevant to the likely future use of the site and are being used as a surrogate to assess short term risks to redevelopment earth workers on-site during the development activities.

The NES methodology document notes that the exposure parameters assumed for the maintenance / excavation scenario in other New Zealand guidelines are unrealistic (perhaps by a factor of ten or more). The technical committee preparing the NES decided that a maintenance / excavation worker scenario should not be included in the NES as sites would not be cleaned up to this standard; it was considered more appropriate that exposures to these workers be limited through the use of site-specific controls that are required under health and safety legislation. However, this report uses commercial / industrial outdoor worker criteria to get a general sense of potential risks to excavation workers during the redevelopment. Note that commercial / industrial outdoor worker criteria are based on personnel carrying out maintenance activities involving soil exposure to surface soil during landscaping activities, and occasional shallow excavation for routine underground service maintenance. Exposure to soil is less intensive than would occur during construction works but occurs over a longer period.

For a construction worker developing the site, the soil exposure is limited when compared to a large earthworks project (e.g. for a residential subdivision or industrial development). As such, the commercial / industrial outdoor worker criteria are considered suitable for obtaining a high-level understanding of potential risks to excavation workers during site redevelopment and confirming the need for site controls.

9 Results

9.1 Field Observations

A summary of the field observations is presented in Table 7.

Table 7: Typical Subsurface Geology

Material Layer	Geological Unit	Typical Depth (m bgl)	Material Description
1	Sandy Gravel	0.0 – 0.9	Loosely packed fine to medium sand with fine gravel
2	Gravel	0.9 – 2.1	Densely packed fine to course gravel with fine to course sand
3	Sandy Gravel	2.1 – 3.0	Tightly packed fine to medium sand with fine gravel

Groundwater was not encountered in any of the sample locations. No visual or olfactory indicators of contamination were observed in the samples taken.

9.2 Analytical Results

Soil analytical results and the adopted soil assessment criteria are presented in Table 8. Certified laboratory analysis reports are included in Appendix 2.

The analytical results can be summarised as follows:

- No Exceedances of human health criteria were found for residential, recreational or commercial / industrial land uses.
- LINZ background levels were exceeded for Arsenic in sample WRH-ENG21-ENV11.
    - Arsenic was identified at 20 mg/kg. Background level is 12.06 mg/kg.

As the average concentrations of the samples across the site are below expected background levels we believe that it is highly unlikely there is a risk to human health and the concentrations identified are suitable for the proposed end use.

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Table 8: Soil Analysis Results:

Analyte	Units	VRH-ENG21-ENV01	VRH-ENG21-ENV04	VRH-ENG21-ENV05	VRH-ENG21-ENV06	VRH-ENG21-ENV07	VRH-ENG21-ENV08	VRH-ENG21-ENV09	VRH-ENG21-ENV10	VRH-ENG21-ENV11	VRH-ENG21-ENV12	Additional Criteria	Assessment Criteria		
												Background - Other (LRIS)	Recreational	Residential - 10% produce	Industrial
Lab Sample ID		2738039_1	2738039_2	2738039_3	2738039_4	2738039_5	2738039_6	2738039_7	2738039_8	2738039_9	2738039_10				
Soil Depth		surface	surface	surface	surface	surface	surface	surface	surface	surface	surface				
Sample Date		14-10-2021	14-10-2021	14-10-2021	14-10-2021	14-10-2021	14-10-2021	14-10-2021	14-10-2021	14-10-2021	14-10-2021				
Arsenic	mg/kg	10	10	11	8	12	11	9	10	**20**	11	**12.06**	80 (A)	20 (A)	70 (A)
Chromium (total)	mg/kg	10	10	10	11	8	8	10	11	8	10	**80.15**	2700 (A)	460 (A)	6300 (A)
Copper	mg/kg	17	20	15	17	12	14	16	15	16	19	**42.85**	10000 (A)	10000 (A)	10000 (A)
Lead	mg/kg	12.2	12.6	12.9	12.3	12.2	11.3	12.3	12.8	13.8	14.3	**44.34**	880 (A)	210 (A)	3300 (A)
Nickel	mg/kg	13	14	13	13	10	12	12	13	12	14	**44.96**	1200 (B)	400 (B)	6000 (B)
Zinc	mg/kg	59	62	54	63	51	51	61	61	54	60	**182.8**	30000 (B)	7400 (B)	400000 (B)
Cadmium	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	**0.34**	400 (A)	3 (A)	1300 (A)

END

Criteria adopted from the following guidelines:

A - Methodology for Deriving Soil Guideline Values Protective of Human Health (NES, 2011)
B - National Environment Protection (Assessment of Site Contamination) Measure (NEPM, 2013)
Background concentrations adopted from PBC - Predicted Background Soil Concentrations, New Zealand for gravel

Notes:

This table does not represent the full analytical results, please refer to the laboratory results for full details.
Assumes soil pH of 5 for Chromium VI.
Criteria for Chromium VI were conservatively selected.

Highlighted	above scenario criteria.
Bold	above background concentrations.

10 Conceptual Site Model

A conceptual site model consists of four primary components. For contaminants to present a risk to human health or an environmental receptor, all four components are required to be present and connected. The four components of a conceptual site model are:

- Source of contamination;
- Pathway(s) in which contamination could potentially mobilise along (e.g. vapour or groundwater migration);
- Sensitive receptor(s) which may be exposed to the contaminants; and
- An exposure route, where the sensitive receptors and contaminants come into contact (e.g. ingestion, inhalation, dermal contact).

The potential source, pathway and receptor linkages at this subject site are provided in Table 9.

Table 9: Conceptual Site Model

Potential Sources	Contaminants of Concern	Exposure Route and Pathways	Receptors	Acceptable Risk? Do samples meet acceptance criteria?
Heavy metals from historic gold mining activities	Heavy metals	Dermal contact with impacted soil, inhalation of dust and ingestion and long term use of the site	Future residents Redevelopment workers Future subsurface maintenance workers Future recreational site users	**Yes**. No exceedances of background or human health criteria were identified. Average concentrations below LINZ background levels

11 Conclusions and Recommendations

ENGEO was engaged to complete a combined Preliminary and Detailed Site Investigation (PSI / DSI) for the site in relation to proposed redevelopment works at Water Race Hill, Lot 4 Terrace Street, Bannockburn. Information was gathered and reviewed regarding the current and past uses of the site, current and past users of hazardous substances, and information on the surrounding area and adjacent properties that have environmental conditions that could have resulted in releases or threatened releases of hazardous substances to the subject property.

The site has been used as agricultural land and also has a history of gold mining from the early 1860's and nearby coalmining through to the 1930's. Although the site is associated with historic mining there is no evidence of active mining on the proposed development site itself. The historic water race channels on the site are believed to have carried water used in sluicing areas such as the "Pennyweight Sluicings" at the north-western edge of the site. These water races and sluicing operations are unlikely to have required the use of contaminative materials.

A site walkover was completed and did not identify visible signs of contamination.

From the information collected during the desktop review and the site walkover the following HAIL activity has been identified:

- E7: Mining industries (excluding gravel extraction) including exposure of faces or release of groundwater containing hazardous contaminants, or the storage of hazardous wastes including waste dumps or dam tailings.

Ten samples were taken and sent to Hill Laboratories for analysis for heavy metals. The sample locations are considered representative of the site, areas where redevelopment workers would come into contact with the material and would also be representative of soils to be disposed of off-site if required.

As the potential soil disturbance would cover the entire site, soil sample locations were completed across the site.

No exceedances of the NES Recreational, Residential or Commercial / Industrial guideline criteria were identified on-site.

The results from one sample was marginally above the expected regional background levels for Arsenic. However, as the average in the samples is below the background levels the soils at the site can be considered cleanfill. This should be confirmed with the landfill operator before excavation.

As the average concentrations of the samples across the site are below expected background levels we believe that it is highly unlikely there is a risk to human health and the concentrations identified are suitable for the proposed end use. As such we consider that the NES does not apply to this site.

The conclusions and recommendations of this report are limited to the areas / depths of soil sampled. Therefore, there is the potential for unidentified hot spots of contamination to exist at the site. A site management plan (SMP) should be prepared to outline procedures to identify and mitigate exposure to unidentified contamination, if encountered during the redevelopment works.

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12 References

MfE Ministry for the Environment. (Revised 2021). Contaminated Land Management Guidelines . No.1: Reporting on Contaminated Sites in New Zealand.

MfE, Ministry for the Environment. (Revised 2021). Contaminated Land Management Guidelines No.2: Hierarchy and Application in New Zealand of environmental guideline values.

MfE, Ministry for the Environment. (Revised 2021). Contaminated Land Management Guidelines No. 5: Site Investigation and Analysis of Soils.

MfE, Ministry for the Environment. (2011). Hazardous Activities and Industries List (HAIL).

MfE, Ministry for the Environment. (2011). Guidelines for assessing and managing petroleum hydrocarbon contaminated sites in New Zealand.

MfE, Ministry for the Environment. (2011). Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health.

MfE Ministry for the Environment. (2012). Users' Guide National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health.

NES The Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations (2011).

13 Limitations

i. We have prepared this report in accordance with the brief as provided. This report has been prepared for the use of our client, DJ Jones Family Trust and Searell Family Trust No 2, their professional advisers and the relevant Territorial Authorities in relation to the specified project brief described in this report. No liability is accepted for the use of any part of the report for any other purpose or by any other person or entity.

ii. The recommendations in this report are based on the ground conditions indicated from published sources, site assessments and subsurface investigations described in this report based on accepted normal methods of site investigations. Only a limited amount of information has been collected to meet the specific financial and technical requirements of the client's brief and this report does not purport to completely describe all the site characteristics and properties. The nature and continuity of the ground between test locations has been inferred using experience and judgement and it should be appreciated that actual conditions could vary from the assumed model.

iii. Subsurface conditions relevant to construction works should be assessed by contractors who can make their own interpretation of the factual data provided. They should perform any additional tests as necessary for their own purposes.

iv. This Limitation should be read in conjunction with the Engineers NZ / ACENZ Standard Terms of Engagement.

v. This report is not to be reproduced either wholly or in part without our prior written permission.

We trust that this information meets your current requirements. Please do not hesitate to contact the undersigned on (03) 328 9012 if you require any further information.

Report prepared by

Gareth Ward

Senior Environmental Scientist

Report reviewed by

Dave Robotham, CEnvP SC

Principal Environmental Consultant

APPENDIX 1:

Site Layout and Sample Location



Legend

- Environmental Sample Locations
- Site Plan

0 50 m 100 m

LINZ CC BY 4.0 © Imagery Basemap contributors

ENGEO

Produced by **Datanest.earth**

Title: Site Layout and Environmental Sampling Locations		
Client: DJ Jones Family Trust & Searell Family Trust No 2		Figure No: 1 Size: A4
Project: Lot 4 Water Race Hill	Drawn: GW	
Date: 26-10-2021	Checked: DR	
Proj No: 19377	Scale: 1:4047	Version: draft

APPENDIX 2:

Site Photographs



Photograph 1: Water Race Hill Site looking towards southwest



Photograph 2: Water Race Hill Site looking towards northeast



Photograph 3: Water Race Hill site historic gold mining water race



Photograph 4: Water Race Hill site looking into Revell's Gully towards northwest

APPENDIX 3:

Soil Analysis Results

Hill Laboratories
TRIED, TESTED AND TRUSTED

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Private Bag 3205
Hamilton 3240 New Zealand

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T +64 7 858 2000
E mail@hill-labs.co.nz
W www.hill-laboratories.com

Certificate of Analysis

Client:	Engeo Limited	**Lab No:**	2738039 SPv2
Contact:	Gareth Ward	**Date Received:**	18-Oct-2021
	C/- Engeo Limited	**Date Reported:**	21-Oct-2021
	PO Box 373	**Quote No:**	82742
	Christchurch 8140	**Order No:**	
		Client Reference:	19377
		Submitted By:	Gareth Ward

Sample Type: Soil

Sample Name:		WRH-ENG21-EN V01 14-Oct-2021	WRH-ENG21-EN V04 14-Oct-2021	WRH-ENG21-EN V05 14-Oct-2021	WRH-ENG21-EN V06 14-Oct-2021	WRH-ENG21-EN V07 14-Oct-2021
Lab Number:		2738039.1	2738039.2	2738039.3	2738039.4	2738039.5
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	10	10	11	8	12
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt	10	10	10	11	8
Total Recoverable Copper	mg/kg dry wt	17	20	15	17	12
Total Recoverable Lead	mg/kg dry wt	12.2	12.6	12.9	12.3	12.2
Total Recoverable Nickel	mg/kg dry wt	13	14	13	13	10
Total Recoverable Zinc	mg/kg dry wt	59	62	54	63	51

Sample Name:		WRH-ENG21-EN V08 14-Oct-2021	WRH-ENG21-EN V09 14-Oct-2021	WRH-ENG21-EN V10 14-Oct-2021	WRH-ENG21-EN V11 14-Oct-2021	WRH-ENG21-EN V12 14-Oct-2021
Lab Number:		2738039.6	2738039.7	2738039.8	2738039.9	2738039.10
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	11	9	10	20	11
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt	8	10	11	8	10
Total Recoverable Copper	mg/kg dry wt	14	16	15	16	19
Total Recoverable Lead	mg/kg dry wt	11.3	12.3	12.8	13.8	14.3
Total Recoverable Nickel	mg/kg dry wt	12	12	13	12	14
Total Recoverable Zinc	mg/kg dry wt	51	61	61	54	60

Analyst's Comments

Appendix No.1 - Chain of Custody

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request. Unless otherwise indicated, analyses were performed at Hill Laboratories, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Soil

Test	Method Description	Default Detection Limit	Sample No
Environmental Solids Sample Drying*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%.	-	1-10
Heavy Metals, Screen Level	Dried sample, < 2mm fraction. Nitric/Hydrochloric acid digestion US EPA 200.2. Complies with NES Regulations. ICP-MS screen level, interference removal by Kinetic Energy Discrimination if required.	0.10 - 4 mg/kg dry wt	1-10

This Laboratory is accredited by International Accreditation New Zealand (IANZ), which represents New Zealand in the International Laboratory Accreditation Cooperation (ILAC). Through the ILAC Mutual Recognition Arrangement (ILAC-MRA) this accreditation is internationally recognised.
The tests reported herein have been performed in accordance with the terms of accreditation, with the exception of tests marked * or any comments and interpretations, which are not accredited.

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Testing was completed between 20-Oct-2021 and 21-Oct-2021. For completion dates of individual analyses please contact the laboratory.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

This certificate of analysis must not be reproduced, except in full, without the written consent of the signatory.



Ara Heron BSc (Tech)
Client Services Manager - Environmental

Hill Laboratories
TRIED, TESTED AND TRUSTED

ANALYSIS REQUEST

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Job No: **273 8039**
Date Recv: 18-Oct-21 07:21
Received by: Simon Argent
3127380394

Quote No

Primary Contact Gareth Ward

Submitted By Gareth Ward

Client Name ENGEO Ltd

Address 25 Glenda Street

Frankton, Queenstown *Postcode* 9300

Phone *Mobile* 0226572009

Email gward@engeo.co.nz

Charge To ENGEO Ltd

Client Reference 19377

Order No

Results To *Reports will be emailed to Primary Contact by default. Additional Reports will be sent as specified below.*

☑ *Email Primary Contact* ☐ *Email Submitter* ☐ *Email Client*

☐ *Email Other*

☐ *Other*

Dates of testing are not routinely included in the Certificates of Analysis. Please inform the Laboratory if you would like this information reported.

CHAIN OF CUSTODY RECORD

Sent to Hill Laboratories
Date & Time: 15-10-2021
Name: Gareth Ward
☐ *Tick if you require COC to be emailed back*
Signature: Gareth Ward

Received at Hill Laboratories
Date & Time:
Name:
Signature:

Condition ☐ *Room Temp* ☐ *Chilled* ☐ *Frozen*
Temp: 16.1

ADDITIONAL INFORMATION / KNOWN HAZARDS

Priority ☐ **Low** ☑ **Normal** ☐ **High**
☐ **Urgent** (ASAP, extra charge applies, please contact lab first)

Requested Reporting Date:

No.	Sample Name	Sample Date	Sample Time	Sample Type	Tests Required (if not as per Quote)
1	WRH-ENG21-ENV01	14-10-2021		Soil	Heavy Metals
2	WRH-ENG21-ENV04	14-10-2021		Soil	Heavy Metals
3	WRH-ENG21-ENV05	14-10-2021		Soil	Heavy Metals
4	WRH-ENG21-ENV06	14-10-2021		Soil	Heavy Metals
5	WRH-ENG21-ENV07	14-10-2021		Soil	Heavy Metals
6	WRH-ENG21-ENV08	14-10-2021		Soil	Heavy Metals
7	WRH-ENG21-ENV09	14-10-2021		Soil	Heavy Metals
8	WRH-ENG21-ENV10	14-10-2021		Soil	Heavy Metals
9	WRH-ENG21-ENV11	14-10-2021		Soil	Heavy Metals
10	WRH-ENG21-ENV12	14-10-2021		Soil	Heavy Metals
11					
12					

Continued on next page



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www.engeo.co.nz

Project Number 19377.000.001

Draft Geotechnical Investigation

Lot 4 Water Race Hill, Bannockburn,

Submitted to:
DJ Jones Family Trust & Searell Family Trust No 2
C/- David Riley
Villa 159, 147 Cavendish Road
Christchurch 8051

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Appendices

Appendix 1: Site Investigation and Geomorph Mapping

Appendix 2: Site Investigation Results

Appendix 3: Interpreted Geologic Cross Section

Appendix 4: Slope Hazard Assessment

Appendix 5: Constraint Map

Appendix 6: Hillslope Development

DRAFT

ENGEO Document Control:

Report Title	Geotechnical Investigation - Lot 4 Water Race Hill, Bannockburn			
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Distribution (PDF)	DJ Jones Family Trust & Searell Family Trust No 2			
Date	Revision Details / Status	Author	Reviewer	WP
02/12/2021	Issued to Client - draft	RD	RJ	DF

DRAFT

1 Introduction & Scope

ENGEO Ltd was requested by Adderley Head (AD) on behalf of DJ Jones Family Trust & Searell Family Trust No 2 to undertake a geotechnical investigation of the property at Lot 4 Water Race Hill, Bannockburn, (herein referred to as 'the site'). The purpose of this service is to support your Resource Consent application for the subdivision of this site into 20 rural residential lots.

Based on discussions with AD, our scope of works comprised:

- Desktop review of published geotechnical and geological information relevant to the site, historical aerial photos and review of Otago Regional Council (ORC) hazard database.
- Site assessment and mapping of relevant geomorphological features by an experienced ground engineering professional.
- Coordinate local buried services location contractor.
- Coordination of a test-pitting contractor to complete 11 test pits (TPs).
- Assessment of geohazards in relation to Section 106 of the RMA.
- Preparation of a standalone report outlining our findings and analysis of the ground conditions and providing geotechnical advice and recommendations suitable for Resource Consent application.

Investigation, analysis and reporting work was carried out in accordance with our signed agreement (ENGEO, 2021; ref: P2021.005.476_01). Additionally, ENGEO carried out an environmental preliminary site investigation (PSI), which was completed under a different scope of works (ENGEO, 2021; ref 19377.000.002_01 dated 4 November 2021).

2 Site and Development Description

The proposed site is situated on an alluvial terrace remnant on the eastern side of Bannockburn area, approximately 3 km northwest from the base of the Carrick Range and immediately west of the Bannockburn Inlet. The site, legally described as Lot 4 DP 339137 comprises an area of land approximately 17.6 hectares in size and is accessed off Terrace Street.

The site shows evidence of former gold mining works dating back to (we assume) pre1900's. This is identified by a network of historic water races and deeply incised sluice gullies in the northwest (Figure 1) with sluice faces and channels.

The ground surface within the subdivision area comprises an undulating terrace between 270 m and 275 m approximately, before dropping steeply to the north towards Revell's Gully, east towards Bannockburn inlet and south towards Shepherds Creek (Figure 1).

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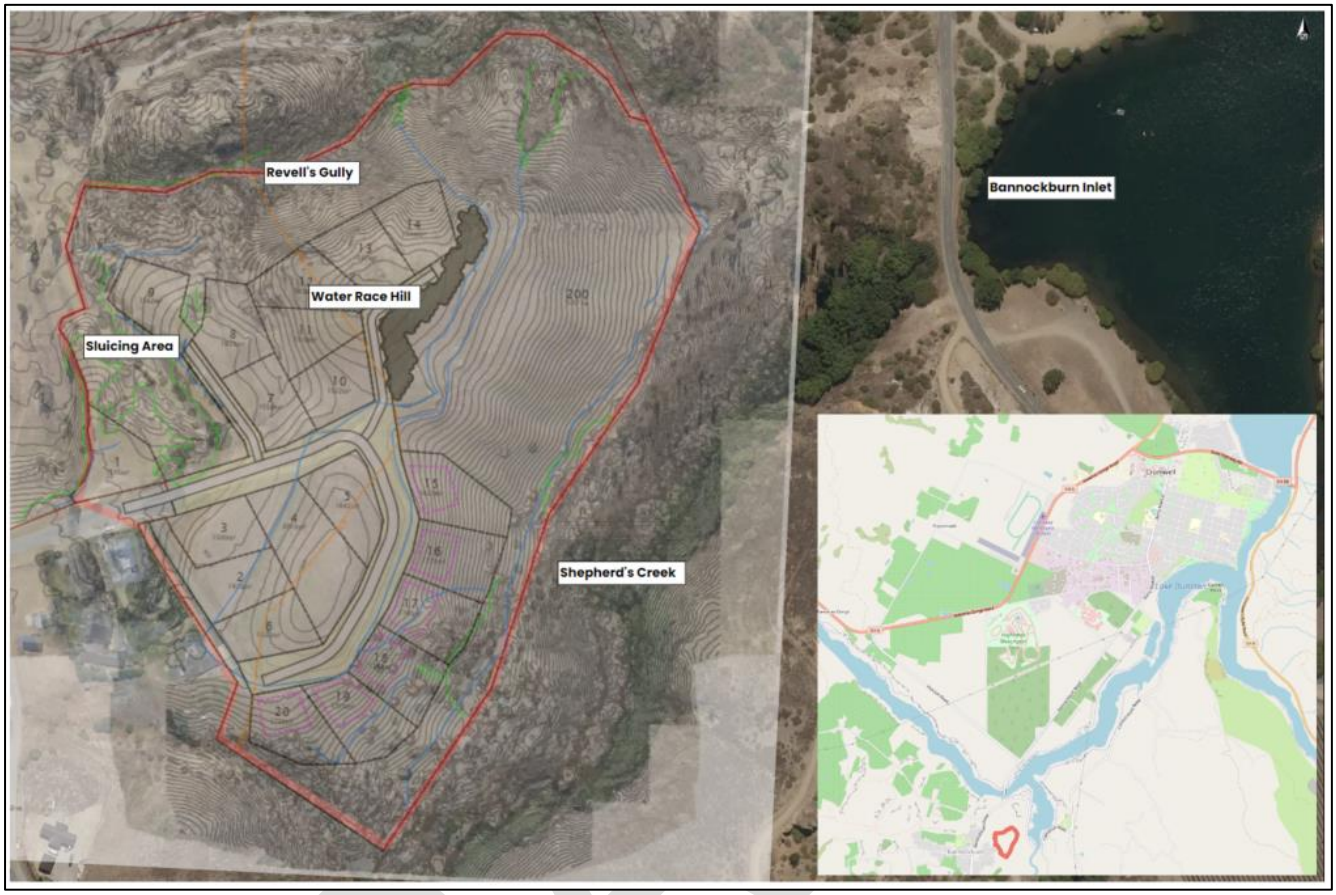


Figure 1: Site Location Plan (LINZ data service, 2021 & Rough & Milne Landscape Architects, 2021)

ENGEO has been supplied with a conceptual subdivision layout drawings by Rough & Milne landscape architects (R&M), dated 21 September 2021. Subdivision layout plan indicates 20 rural residential lots ranging from 1500 m^2 to 3010 m^2 in size with associated accessways (Figure 1).

3 Desktop Study

3.1 Geologic Setting

The subject site is geologically mapped at 1:250,000 as being underlain by Bannockburn and Dunstan Formations of the Manuherikia Group and basement Schist bedrock (Turnbull, 2000). Manuherikia Group consists of lake clays, silts, oil shales and lignite. These sediments are Miocene in age (24 - 5.3 million years old) and were deposited in a freshwater lake that extended across most of the Wakatipu region east of The Remarkables and north toward Lindis Pass.

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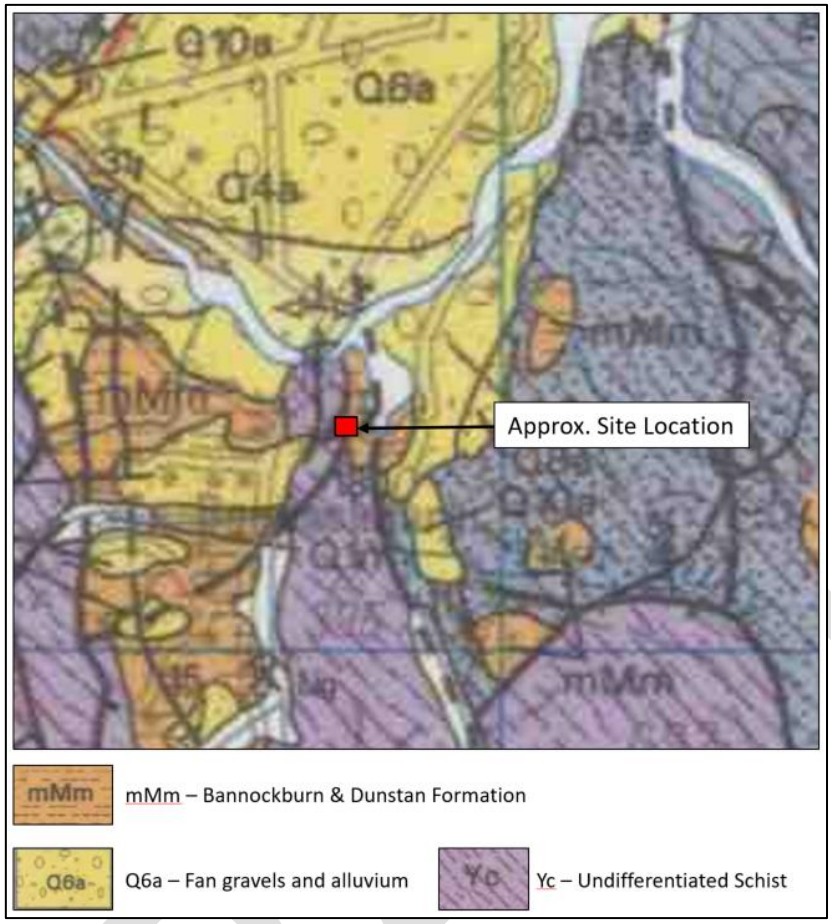


Figure 2: Regional Geology Map (image modified from Turnbull, 2000)

Alluvial Gravels, derived from alluvial fan deposits sourced from the nearby Carrick Range have been mapped in close vicinity to the site (Pedley, K, GNS Science 2017). It is possible a mantle of colluvium is also present, particularly on the steeper south-eastern aspect slopes of the site. Colluvium (if present) is likely to comprise remobilised lacustrine sediments and / or alluvial gravels.

3.2 Seismicity

No active fault traces were observed in the field nor have been reported in the vicinity of the site. The only known active faults within the 20 km of the site are the Dunstan Fault (comprising north and south splays) which is approximately 15 km to the east and the Pisa Fault which is approximately 5 km to the west (Figure 3). The Dunstan Fault, is noted in the GNS Active Faults Database to be a reverse fault and has a recurrence interval of c. 5,000 to 10,000 years. It is estimated that a magnitude 7 earthquake on either the Dunstan North or South Faults could result in shaking equivalent to a Modified Mercalli VIII or 'severe' level of shaking. The Pisa Fault is also noted by GNS to be a reverse fault and has a recurrence interval of c. 10,000 to 20,000 years (Barrell, 2019a). While these are the closest known faults to the site, the Alpine Fault is expected to be the greatest seismic hazard to the region (Mackey, 2015).

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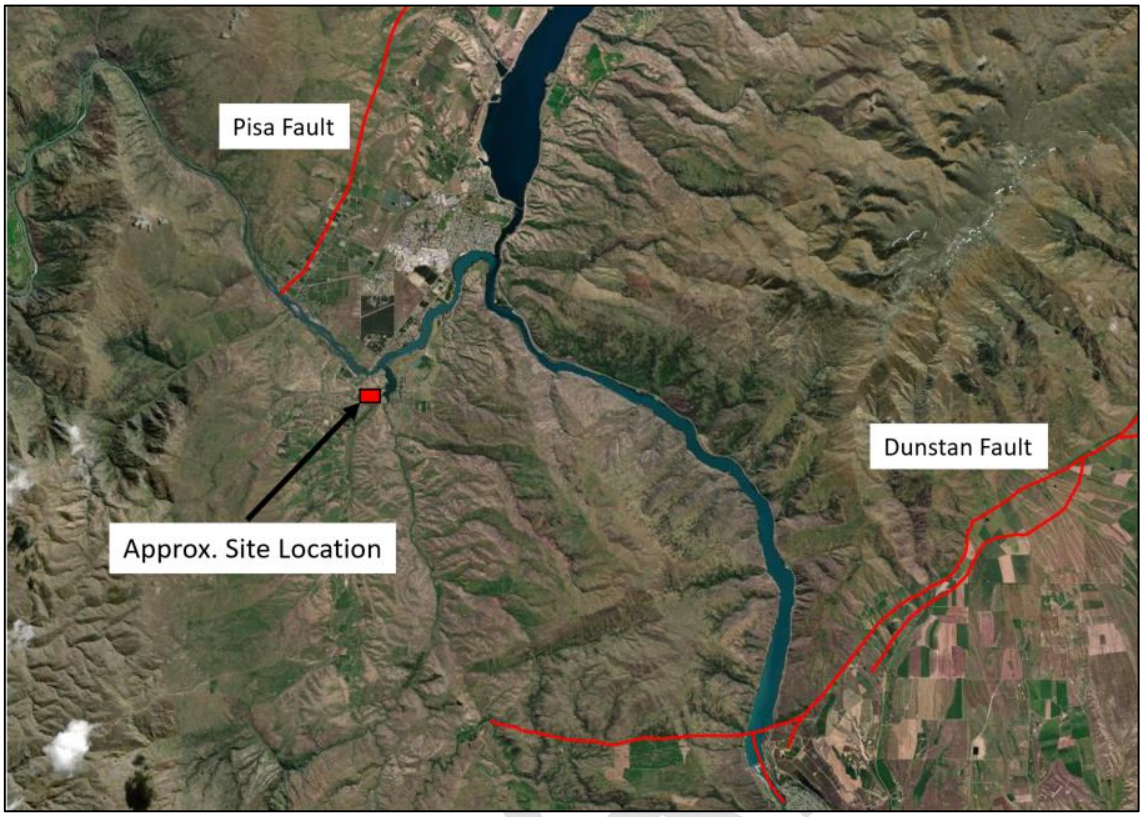


Figure 3: Active Fault Traces in the Region (image modified from GNS NZ Active Fault Database)

The Alpine Fault is an oblique strike-slip fault and is located approximately 100 km northwest of the site. The fault has an estimate recurrence interval of < 2,000 years, with four documented earthquakes occurring in the past 900 years. A magnitude (Mw) 8.1 alpine fault earthquake along the Alpine Fault is expected to result in a ground shaking intensity of MMVII (Modified Mercalli intensity scale) across the Cromwell area (Mackey, 2015).

3.3 Third Party Hazard Database

ENGEO has reviewed Otago Regional Council (ORC) natural hazards database and GNS Science New Zealand Active Fault Database. Relevant hazard categories are summarised as follows:

- The site is mapped as having a liquefaction susceptibility of '*Domain A*' (nil to low susceptibility) due to being underlain by rock or firm sediments (Barrell, 2019b) (Figure 4).
- An inactive alluvial fan is mapped as entering the site in the far western extent (Figure 4.) No landslides (active or inactive) have been mapped within the site area.

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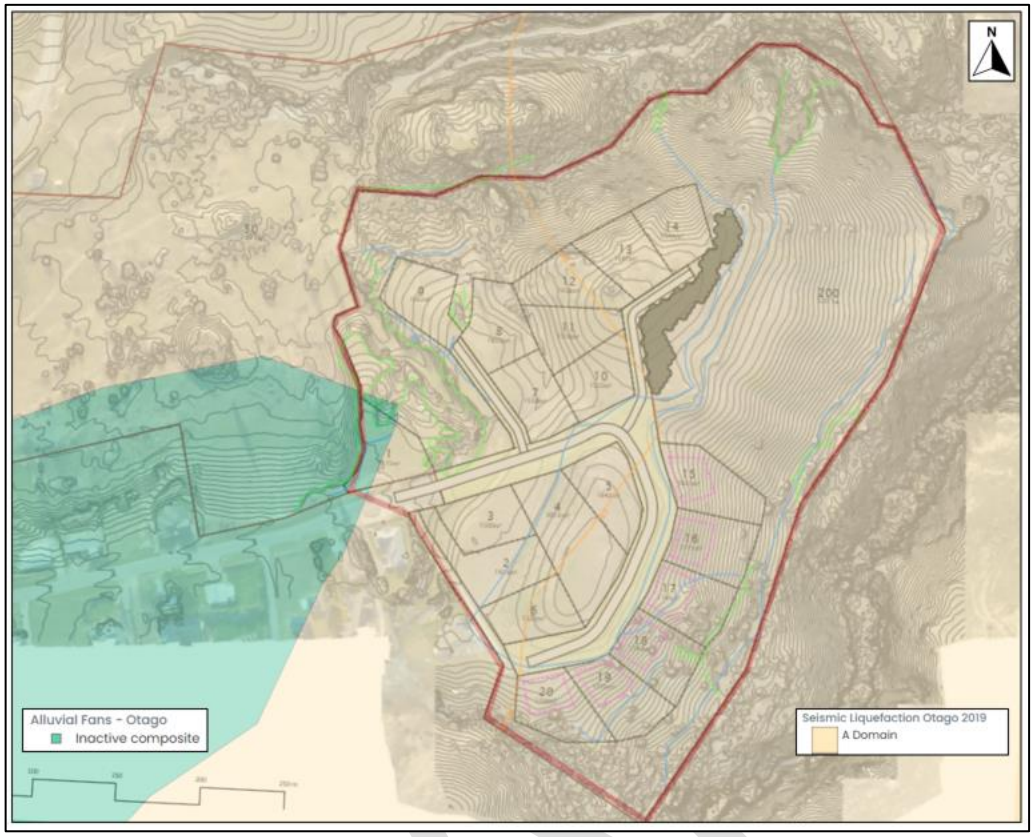


Figure 4: ORC Hazard Map (Sourced from ORC Hazard Database).

3.4 Historic Aerial Photographs

Review of historic aerial images through Retrolens between 1950 and 2003 have been used to assess historic changes in geomorphological features and landform use.

Images from 1950 show the presence of historic water races across the site. It is noted that the site has remained an undeveloped green field site over this time period.

No significant geomorphological changes have been observed, however this interpretation has been made with caution as aerial images were captured from a far distance, making smaller localized changes difficult to identify.

4 Site Investigation

4.1 Site Assessment Observations

ENGEO undertook a site assessment on 12 October 2021 to map the surface geomorphology and identify geohazards concerned with the development. The following observations were made:

- Lots 15 to 19 are located on moderately sloping (approximately 20°) relief on the southeast aspect of the site.
- Ground cracking observed within Lot 18 was initially considered to indicate possible signs of slope movement (Photo 1). This is discussed further in Section 5.

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- Lots 1 and 9 are constrained to the west by vertical unsupported banks that are between approximately 4 to 6 m high (Photo 2). Evidence of ground displacement (tension cracking) was observed approximately 3 m from the crest of the bank in Lot 9 (Photo 3).
- *In situ* schist bedrock outcrops were mapped in various locations across the site. Foliation in these outcrops were measured as generally dipping approximately 16º – 22º towards 125º – 165º (Photo 4).



Photo 1: Ground cracking within Lot 18 boundaries.



Photo 2: Image looking north through main sluicing gully between proposed Lots 1 and 9. Lot 9 is located above on right hand side.



Photo 3: Image showing slope displacement on crest of bank in Lot 9.



Photo 4: Schist outcrop located at the high point of Water Race Hill within Lot 13.

Figure 5: Select Images from Site Assessment

Location of mapped geomorphological features are included within Appendix 1.

4.2 Geotechnical Site Investigation

ENGEO completed a geotechnical site investigation on 14 October and 24 November 2021 including the following scope:

- Eleven TPs to between 0.9 m and 2.5 m depth with associated dynamic cone penetrometer (DCP) testing to estimate the *in situ* density of subsurface material.

- Four hand auger (HA) boreholes to between 0.3 m and 1 m depth with associated dynamic cone penetrometer (DCP) testing to estimate the *in situ* density of subsurface material.

TPs were completed by Donerite Contractors using a 10 ton excavator. Investigations were observed by ENGEO and logged in the field in accordance with the New Zealand Geotechnical Society (NZGS) field-description of soil and rock guidelines.

Investigation locations are included in Appendix 1, TP and HA logs are included within Appendix 2.

4.3 Subsurface Geology

Our site investigation generally identified a layer of topsoil between 0.2 m to 0.3 m thick covering the majority of the site.

TPs located in the western extent of the site intercepted between 0.3 to 0.8 m of weathered alluvium, comprising medium dense to dense fine sand with some silt and minor gravels. Coarser grained but thinly bedded alluvium was encountered below this to the target depth of 2.5 m. This material was typically recovered as well graded fine to coarse gravel and sand. The material interpreted in these TPs is consistent with soil exposure 1 & 2 logged in the vertical bank walls adjacent to Lots 1, 7 and 8 and is considered to represent terrace Alluvium.

WRH-ENG21-TP10 (Lot 9) interpreted fine sandy silt, yellowish brown, very stiff, dry and friable with low plasticity. Fine grained, lacustrine material was homogenous down to a target depth of 2.5 m.

Surficial soils interpreted within TPs across the remainder of the site were reasonably consistent. Below topsoil between 0.0 m to 0.9 m of lacustrine material, typically recovered as medium dense to dense silty fine sand was encountered. Highly to slightly weathered, extremely weak to moderately strong Schist was interpreted below lacustrine material. TPs refused between 0.8 and 1.7 m in schist bedrock.

The orientation of foliation within the Schist was measured in TPs WRH-ENG21-TP02 and WRH-ENG21-TP09 as generally between 18º – 22º dip to the southeast, consistent with measurements taken from surrounding schist outcrops (Section 4.1).

Hand augers completed within Lot 18 interpreted colluvium overlying shallow bedrock to depths between 0.3 m and 1 m. Colluvium typically comprised remobilized lacustrine sediments and was recorded as silty fine sand, light brown, medium dense, dry and poorly graded. An interpreted geologic cross section intersecting Lot 18 is provided in Appendix 3.

Groundwater was not encountered in any of the test pits completed by ENGEO.

5 Geohazard Assessment

Based on our desktop study of ORC hazard database (Section 3.3) and site investigation (Section 4), ENGEO considers it unlikely the proposed development will be adversely affected by alluvial fan risks, liquefaction potential and rockfall hazards. However, during our site assessment (Section 4.1) we identified signs of a possible shallow, small scale localized failure within Lot 18 boundary that required further slope stability assessment. The results of this additional assessment are provided in the following section.

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5.1 Slope Stability

5.1.1 Lot 18 Slope Stability Investigation

As indicated in Section 4.1, there appeared to be evidence of a shallow landslide in the vicinity of proposed Lot 18. ENGEO completed geomorphic mapping, four HAs, associated DCP testing and preparation of an interpreted geologic ground model (Appendix 3) across Lot 18 to further understand the likely cause of shallow failure signs identified during the site assessment.

Geomorphic mapping in Lot 18 observed *in situ* schist bedrock outcrops in close vicinity to where ground cracking was observed suggesting shallow depth to rock. An historic water race feature was also identified approximately 20 m directly up slope that has potential to provide seepage to the area. However, ENGEO could not observe a toe bulge down-slope of the ground cracking to suggest localized slope failure.

HA and DCP investigation across Lot 18 slope alignment confirmed shallow depth to inferred bedrock, between 0.3 m (where ground cracking was observed) to 1 m. Investigation results returned a lack of evidence in the subsoil to suggest localized slope failure e.g., no changes in moisture, no disturbed or void zones and the density of subsurface material was consistent and generally increased with depth. These findings have been illustrated on the interpreted geologic cross section included in Appendix 3.

As such, it is our opinion that ground cracking has occurred from long term creep of surficial soils over shallow bedrock and not as a result of larger scale landslide failure.

5.1.2 Slope Hazard Assessment

To further characterise the landslide potential across the proposed subdivision, we have utilised contour data gathered by Landpro Ltd. As part of an aerial drone survey undertaken in 2016 to group the sloping site into areas of similar gradient. For the purposes of this analysis we have adopted the following slope gradient categories:

- Instability unlikely where slope angles are less than 10°.
- Instability unlikely where slope angles are between 10° and 17.5°.
- Instability possible where slope angles are between 17.5° and 25°.
- Instability unlikely under earthquake or rainfall events where slope angles are between 25° and 32.5°.
- Instability likely where slope angles are between 32.5° and 37.5°.
- Instability expected where slope angles are greater than 37.5°.

Our resulting slope hazard assessment is presented in Appendix 4. The resultant hazard mapping is limited by resolution of the drone and the vegetation coverage in specific areas that slightly alter the contours.

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5.2 Seismic Hazards

Potential seismic hazards resulting from nearby moderate to major earthquakes can generally be classified as primary and secondary. The primary effect is ground rupture, also called surface faulting. The common secondary seismic hazards include ground shaking, regional subsidence or uplift, soil liquefaction, lateral spreading, landslides.

5.2.1 Ground Rupture

There are no known active faults within the site. Based on our site walkover and review of relevant publications (Section 3.2) it is our opinion that fault-related ground rupture is unlikely at the subject site.

5.2.2 Site Subsoil Classification

Based on the investigation information detailed in Section 4 interpreting the shallow depth to bedrock, we consider the soil classification in line with NZS 1170.5:2004 to be 'Class C – Shallow Soil' for the purpose of seismic design.

5.2.3 Seismic Design Considerations

For the purposes of characterising seismic design, we have assumed that the subdivision will be developed with Importance Level 2 (IL2) structures only. Further analysis will be required if the development is to incorporate structures of higher importance levels.

According to NZS 1170.0:2002, Importance Level 2 (IL2) buildings should sustain little or no structural damage under a Serviceability Limit State (SLS) design load case, which is based on earthquake shaking with a 25 year return period. Further, IL2 buildings are required to be designed to resist earthquake shaking with an annual probability of exceedance of 1/500 (i.e., a 500 year return period). This is the Ultimate Limit State (ULS) design seismic loading.

The design peak ground accelerations (PGA) for the site under both ultimate limit state (ULS) and serviceability limit state (SLS) design load cases have been calculated from NZS 1170.5:2004 using the recommendations of the New Zealand Geotechnical Society as follows:

Peak horizontal ground accelerations (a_{max}) have been calculated in accordance with MBIE / NZGS Module 1 (2016) using the following formula:

$$a_{max} = C0,_{1000}\ R\ f\ g\ /\ 1.3.$$

Where

$C_{0,1000}$ = 0.33 for Cromwell (Commentary to the NZTA Bridge Manual (2018) Table C6.1)

R = 1 for a 500 year return period event (NZS1170.5) (ULS)

= 0.25 for a 25 year return period event (NZS1170.5) (SLS)

f = 1.3 for Class C

Thus a_{max} = = 0.33 x 0.25 x 1.3 / 1.3 = 0.08 g (SLS)

= 0.33 x 1.0 x 1.3 / 1.3 = 0.33 g (ULS)

The effective earthquake magnitude for the Cromwell area has been assumed to be 6.25.

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5.3 Development Constraints Assessment

To provide guidance for future development, we have prepared a constraints map outlining potential risk to the proposed subdivision by combining our knowledge of past and present site conditions to guide future works. The constraints map considers interactions between the following:

- Site geology (subsurface conditions, identified through our site observations and subsurface investigations).
- Geomorphological conditions (the locations of landslides and other features identified through our site observations and aerial photograph reviews).
- Topographical conditions (utilising drone survey data to characterise areas of similar slope gradients).

Combining these factors, we have developed the risk classes presented in **Error! Reference source not found.**1 below. We have been advised that the proposed subdivision will be entirely low density and rural residential development, and our assessment of risk has taken this into consideration when assessing vulnerability.

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Table 1: Development Risk Classes

Development Risk Class	Hill Slope Characteristics	Limitations to Development
1	Low slope gradients (less than 17.5°) No obvious evidence of instability	Little to no limitations to residential development (subject to foundation suitability)
2	Areas of moderate slope gradient (17.5° to 25°) May be evidence of instability following heavy rainfall or large earthquake events No obvious evidence of instability	May require shallow earthworks to form a suitable building platform
3	Moderate to steep slope gradients (25° to 32.5°) Instability is likely under earthquake or rainfall events (includes potential for inundation from upslope) or Some evidence of small scale instability	Will likely require specific engineering design to form a suitable building platform
4	Steep slope gradients (32.5° to 37.5°) Instability is likely under earthquake or rainfall events (includes potential for inundation from upslope) or Evidence of large-scale inactive or relict slope instability	Will require specific engineering design and substantial foundations and / or earthworks to form a suitable building platform
5	Steep slope gradients (greater than 37.5° from horizontal) and indications of recent instability or Evidence of large-scale, active slope instability	Complex or large-scale engineering works required to develop. Consideration should be given to avoiding these other areas owing to severe physical limitations that are likely to be difficult to overcome

Note that these are based on the current site topography and assume only minimal earthworks to develop the site into residential lots. Should extensive earthworks be proposed (such as valley in-fills), the Constraint areas would need to be reassessed.

A site map presenting our interpreted development classes is presented in Appendix 5.

In some areas the map within Appendix 5 indicates higher development risk classes immediately adjacent to a lower risk category. In this instance, we recommend that that the lot specific geotechnical investigation takes into consideration risk posed by the adjacent area such that appropriate mitigation solutions are incorporated into the development works.

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6 Geotechnical Recommendations

Based on our geotechnical assessment to date, ENGEO consider the site at Lot 4 Water Race Hill, Bannockburn to be suitable for the proposed development from a geotechnical perspective, subject to recommendations in Sections 6.1 through 6.6.

6.1 Section 106 Hazard Assessment

In accordance with Section 106 of the Resource Management Act we have assessed the potential for geological hazards which may impact the proposed development. Of the assessed natural hazards, we consider slope stability to be the most likely impact to the development.

We have considered our site investigation (Section 4), slope stability hazard assessment (Section 5.1, Appendix 4) and development constraint map (Section 5.3, Appendix 5) while assessing the potential risk from identified geohazards to the proposed subdivision.

Majority of proposed lots across the site have been assessed as development risk Class 1. If geotechnical recommendations outlined in following sections are adopted, these lots are not expected to be subject to significant risk from geohazards identified in this report in accordance with the provisions of Section 106 of the Resource Management Act 1991.

Proposed lots along the southern boundary (Lots 15, 16, 17 and 19), occupy moderately sloping relief and have been assessed as development risk class 2. We consider these proposed lots unlikely to accelerate, worsen or result in material damage to the land, provided good engineering practice for hill slope development (AGS, 2007) is applied (Appendix 6). Shallow earthworks may be required to create a stable building platform as part of subdivision works.

Proposed Lot 18 has been categorised as development risk class 3 due to its location on moderately sloping ground and ground cracking identified during our site assessment (Section 4.1). ENGEO completed further specific investigation within Lot 18 (Section 5.1.1) and noted that the source of ground cracking is likely due to creep of surficial soil overlying shallow bedrock up to 0.3 m depth. It is not clear that there is a significant risk from the geohazard identified, and it is our opinion this hazard will be able to be mitigated through a combination of good engineering practises for hill slope development (Appendix 6) and specific engineering mitigation design.

6.2 Foundations

We understand that at this stage of the development process site plans are preliminary only and foundations are yet to be designed. A range of preliminary foundation recommendations are provided below based on our investigations and observations.

- Foundations bearing on the native gravelly alluvial, engineered fill or bedrock materials can be designed for a geotechnical Ultimate Bearing Capacity (UBC) of 300 kPa. As required by Section B1/VM4 of the New Zealand Building Code, a strength reduction factor of 0.33 or 0.50 must be applied to all recommended geotechnical ultimate soil capacities (for shallow foundations) in conjunction with their use in factored design load cases for serviceability and ultimate limit state conditions, respectively.

- Foundations bearing on lacustrine silts and sand material should be further assessed for specific bearing capacities during detailed design works.

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6.3 Setback Zone

Based on our site assessment observations, ENGEO recommends setback zones are applied along the western crests of both Lot 1 and 9 to reduce crest loading from nearby structures and promote slope stability of the adjacent banks.

ENGEO recommends that foundation construction in Lot 1 and 9 are setback from the crest at a horizontal distance at least twice the adjacent vertical slope height (V), Photo 5. The vertical slope height may be measured from the top of the talus apron that buttresses the base of the vertical slope. We note that this is steeper than allowed for in Section 3.1.2 of NZS3604, however we consider it to be appropriate for the granular materials encountered in both lots. Setback distances should be further assessed and defined by a surveyor during detailed design works for Lot 1 and 9.

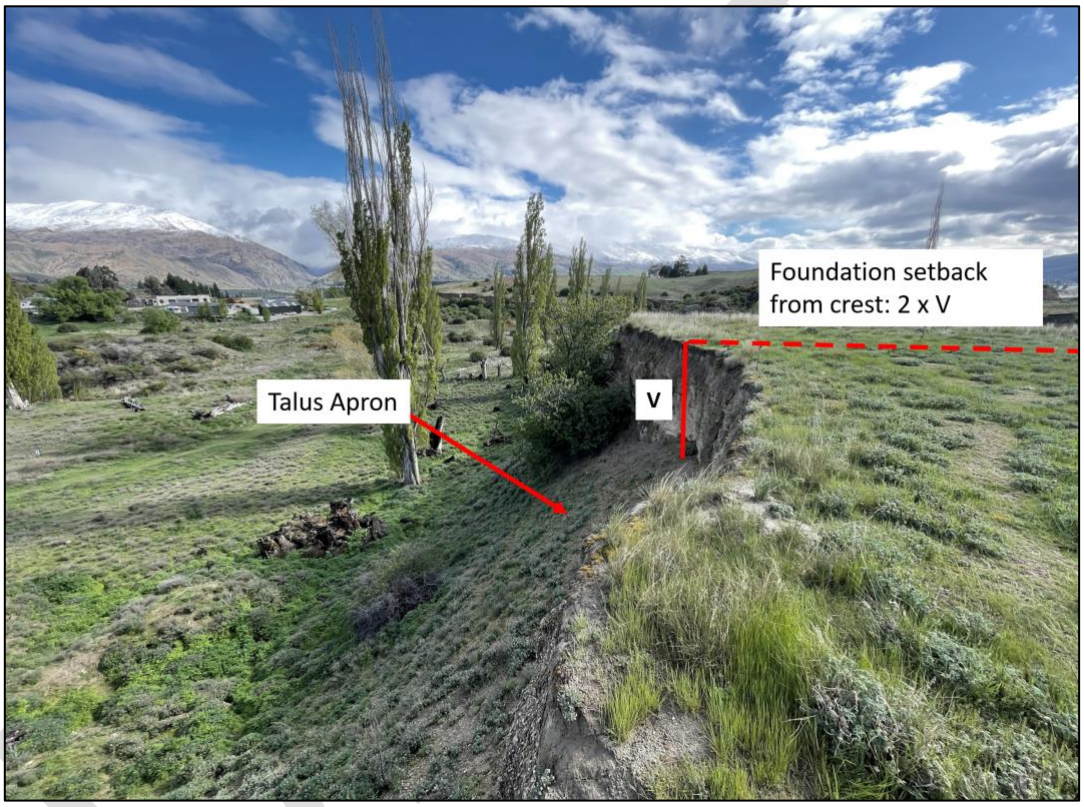


Photo 5: Image showing example setback calculation for Lot 1 & 9.

Setback zone dimensions may be optimized if retaining solutions are explored during Building Consent and detailed designed works.

6.4 Sustainability

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We encourage you to consider sustainability when assessing the options available for your project. Where suitable for the project, we recommend prioritising the use of sustainable building materials (such as timber in favour of concrete or steel), locally sourced (materials readily available to Contractors as opposed to materials requiring import), and installed in an environmentally friendly way (e.g., reduced carbon emissions and minimal contamination). If you would like to discuss these options further, ENGEO staff are available to offer suggestions.

6.5 Future Geotechnical Involvement

The investigations completed to date are intended to support the Resource Consent application (by AD), and to inform the conceptual design of foundations. Further investigation and analysis may be required to support detailed design and Building Consent (by others) once development plans are further progressed.

7 Limitations

i. We have prepared this report in accordance with the brief as provided. This report has been prepared for the use of our client, DJ Jones Family Trust & Searell Family Trust No 2, their professional advisers and the relevant Territorial Authorities in relation to the specified project brief described in this report. No liability is accepted for the use of any part of the report for any other purpose or by any other person or entity.

ii. The recommendations in this report are based on the ground conditions indicated from published sources, site assessments and subsurface investigations described in this report based on accepted normal methods of site investigations. Only a limited amount of information has been collected to meet the specific financial and technical requirements of the client's brief and this report does not purport to completely describe all the site characteristics and properties. The nature and continuity of the ground between test locations has been inferred using experience and judgement and it should be appreciated that actual conditions could vary from the assumed model.

iii. Subsurface conditions relevant to construction works should be assessed by contractors who can make their own interpretation of the factual data provided. They should perform any additional tests as necessary for their own purposes.

iv. This Limitation should be read in conjunction with the Engineering NZ/ACENZ Standard Terms of Engagement.

v. This report is not to be reproduced either wholly or in part without our prior written permission.

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We trust that this information meets your current requirements. Please do not hesitate to contact the undersigned on (03) 328 9012 if you require any further information.

Report prepared by

Ryan Dingle
Engineering Geologist

Report reviewed by

Richard Justice, CMEngNZ (PEngGeol)
Principal Engineering Geologist

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8 References

Australian Geomechanics; Volume 42, No 1; Landslide Ris Management. Dated March, 2007

Barrell, D. J. A (2019a). General distribution and characteristics of active faults and folds in the Queenstown Lake and Central Otago districts, Otago. Lower Hutt (NZ): GNS Science. Consultancy Report 2018/207.

ENGEO (2021), Geotechnical Investigation Proposal – Lot 4 Water Race Hill, Bannockburn. Dated 31 August 2021

Pedley, K 2017. Bannockburn Sluicings. Institute of Geological and Nuclear Sciences

LINZ data services; Aerial imagery of New Zealand Base Map

Mackey B. 2015. Seismic hazard in the Queenstown Lakes district. Dunedin (NZ): Otago Regional Council. 88 p. GNS Science (2009). Otago Alluvial Fans Project: Supplementary maps and information on fans in selected areas of Otago.

Rough & Milne Landscape Architects. Master Plan – 20 Lot Option Bannockburn Subdivision; Drawing no. L1.1, dated 21 September 2021.

Turnbull, I.M. (2000). Geology of the Wakatipu area. Institute of Geological and Nuclear Sciences 1:250 000 geological map 18.

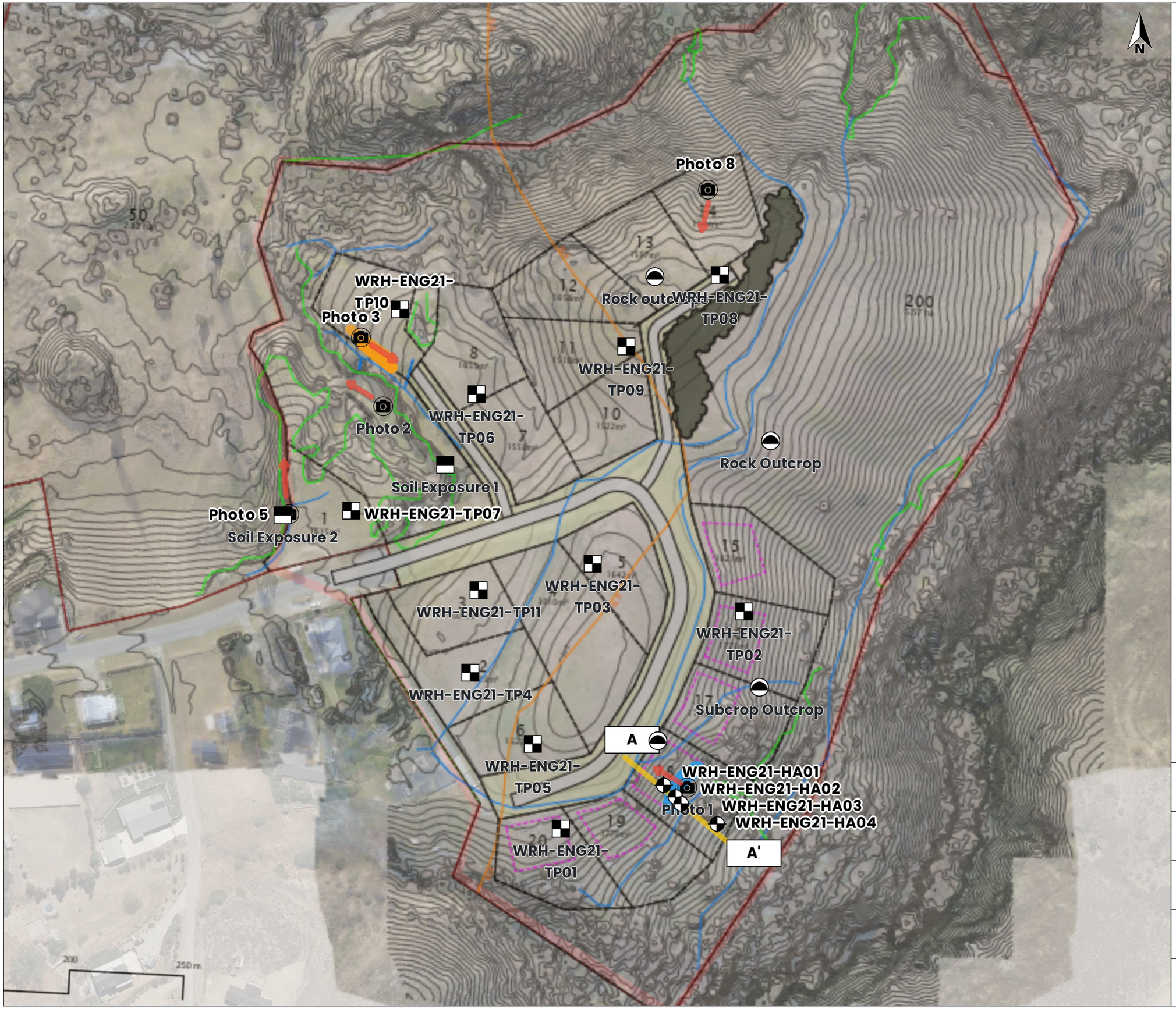
We also acknowledge the New Zealand GeoNet project and its sponsors EQC, GNS Science and LINZ, for providing data used in this report.

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APPENDIX 1:

Site Investigation and Geomorph Mapping

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Legend

- ENGEO Hand Auger Investigation Locations
- ENGEO Test Pit Investigation Locations
- Soil Exposure Location
- Outcrops
- Site Photo Locations
- Cross Section Alignment
- Lot 9 Soil Creep
- Lot 18 ground cracking
- Site Boundary

0 25 m 50 m

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ENGEO

Produced by **Datanest.earth**

Title: Site Investigation & Geomorphological Features Location		
Client: DJ Jones Family Trust & Searell Family Trust No 2		Figure No: 1 Size: A3
Project: Lot 4 Water Race Hill	Drawn: RD	
Date: 30-11-2021	Checked: RJ	
Proj No: 19377	Scale: 1:1500	Version: Final

APPENDIX 2:

Site Investigation Results

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Geotechnical Soil Logging Key

ENGEO borehole and test pit logs are written in general accordance with the New Zealand Geotechnical Society field classification guidelines (2005).
Please refer to this document for the methods of field classification and description for engineering purposes.

Grain Size (mm)

0.06	0.2	0.6	2	6	20	60	200

SILT and CLAY	SAND			GRAVEL			COBBLE	BOULDER
	Fine	Medium	Coarse	Fine	Medium	Coarse		

Additional Info

▼	Standing water level
UTP	Unable to Penetrate
NA	Not Assessed

Graphic Logs

The graphic log shows soil types and their corresponding UCS classification

Granular Soil (>65% of soil >0.06 mm)			Cohesive Soil (>35% of soil <0.06 mm)		
GW	Well graded GRAVEL		MH	High plasticity SILT	
GP	Poorly graded GRAVEL		ML	Low plasticity SILT	
GM	Silty GRAVEL		CH	High plasticity CLAY	
GC	Clayey GRAVEL		CL	Low plasticity CLAY	
SW	Well graded SAND			**Rock**	
SP	Poorly graded SAND		OH	Schist Bedrock	
SM	Silty SAND		OL		
SC	Clayey SAND		PT		
Other Soils					
TS/BTS	Topsoil/ Buried Topsoil		F	Fill	

G = Gravel W = Well Graded P = Poorly Graded C = Clay S = Sand M = Silt H = High Plasticity L = Low Plasticity O = Organic

Cohesive Soils - Consistency Index

		Undrained shear strength (kPa)	Field Diagnostic Features
VS	Very Soft	<12	Easily exudes between fingers when squeezed
S	Soft	12 – 25	Easily indented by fingers
F	Firm	25 – 50	Indented by strong finger pressure and can be indented by thumb pressure
St	Stiff	50 – 100	Cannot be indented by thumb pressure
VSt	Very Stiff	100 – 200	Can be indented by thumb nail
H	Hard	200+	Difficult to indent by thumb nail

Moisture Content

D	Dry	Looks and feels dry
M	Moist	Feels cool and darkened in colour and granular soils tend to be cohere
W	Wet	Feels cool and darkened in colour. Granular soils tend to cohere and free water forms when remoulding cohesive soils
S	Saturated	Feels cool, darkened in colour and free water present on the sample

Granular Soils - Density Index

		SPT 'N' Value (blows /300mm)	Scala Penetrometer (blows/100 mm)
VL	Very loose	<4	0 - 2
L	Loose	4 – 10	1 – 3
MD	Medium Dense	10 - 30	3 - 7
D	Dense	30 - 50	7 – 17
VD	Very Dense	<50	>17

Proportional Terms Definition

Fraction	Term	% of Soil	Example
Major	(UPPERCASE)	>50	GRAVEL
Subordinate	(lowercase)y	20 - 50	Sandy
Minor	With some....	12 - 20	With some sand
	With minor....	5 - 12	With minor sand
	With trace....	<5	With trace sand

Soil Structure

Zoning		Cementing	
Layers	Continuous across exposure or sample	Weakly Cemented	Easily broken up by hand in air or water
Lenses	Discontinuous layers of lenticular shape	Moderately cemented	Effort is required to break up the soil by hand in air or water
Pockets	Irregular inclusions of different material		

ENGEO

Test Pit Log

Client: Searell Jones
Project: Lot 4 Water Race Hill
Location: Bannockburn
Project Number: 19377

Hole I.D:
Soil Exposure 1

Method: Soil Exposure
Contractor:
Operator:
Equipment:
Bucket Size: mm
Vane Number: N/A

Coordinates E: -45.087057
(NZTM) N: 169.166603
Elevation (mRL): 269
Elevation Datum: NZTM

Maximum Depth: 3 m
Survey Method: Leica FLX100
Start Date: 12/10/2021
Finish Date: 12/10/2021
Logged By: RD
Reviewed By:

Elevation (mRL)	Geological Unit	Excavatability (relative scale) Easier – Harder	DESCRIPTION (SOIL: Classification, colour, consistency / density, moisture, plasticity, additional features (grain size, roundness, composition etc. as applicable))	Depth (m BGL)	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density	Sample	Testing / Additional Comments	Dynamic Cone Penetrometer Blows per 100mm (2 4 6 8 10 12)
269			Fine to medium SAND with minor gravel; brown. Loosely packed; dry; poorly graded; gravel, fine, subrounded to subangular [ALLUVIUM]	0.5							
268	ALLUVIUM		Sandy fine to coarse GRAVEL; brown. Tightly packed; dry; well graded; sand, fine to coarse [ALLUVIUM].	1.0			D				
267			Fine to medium SAND with minor gravel; brown. Tightly packed; dry; poorly graded; gravel, fine, subrounded [ALLUVIUM].	1.5							
266			Depth of Excavation: 3 m Termination Condition:	2.0 2.5 3.0							

DRAFT

Photos / Sketches

TP = Tightly Packed, LP = Loosely Packed

ENGEO

Test Pit Log

Client: Searell Jones
Project: Lot 4 Water Race Hill
Location: Bannockburn
Project Number: 19377

Hole I.D:
Soil Exposure 2

Method: Soil Exposure
Contractor:
Operator:
Equipment:
Bucket Size: mm
Vane Number: N/A

Coordinates E: -45.086988
(NZTM) N: 169.16572
Elevation (mRL): 266
Elevation Datum: NZTM

Maximum Depth: 3 m
Survey Method: Leica FLX100
Start Date: 12/10/2021
Finish Date: 12/10/2021
Logged By: RD
Reviewed By:

Elevation (mRL)	Geological Unit	Excavatability (relative scale) Easier – Harder	DESCRIPTION (SOIL: Classification, colour, consistency / density, moisture, plasticity, additional features (grain size, roundness, composition etc. as applicable))	Depth (m BGL)	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density	Sample	Testing / Additional Comments	Dynamic Cone Penetrometer Blows per 100mm (2 4 6 8 10 12)
265	ALLUVIUM		Sandy fine to coarse GRAVEL; brown. Tightly packed; dry; well graded; sand, fine to coarse [ALLUVIUM].	0.5				TP			
				1.0							
			Fine to coarse SAND with minor gravel; brown. Loosely packed; dry; well graded; gravel, fine to coarse, 300 mm thick discontinuous lens [ALLUVIUM].	1.5			D				
264				2.0				LP			
				2.5							
263			Gravelly fine to coarse SAND; brown. Loosely packed; dry; well graded; gravel, fine to medium, subangular [ALLUVIUM].	3.0							
			Depth of Excavation: 3 m Termination Condition:								

DRAFT

Photos / Sketches

TP = Tightly Packed, LP = Loosely Packed

ENGEO

Test Pit Log

Client: Searell Jones
Project: Lot 4 Water Race Hill
Location: Bannockburn
Project Number: 19377

Hole I.D:
WRH-ENG21-TP01

Method: Bucket Excavator
Contractor: Donerite
Operator: Chase
Equipment: 10t Excavator
Bucket Size: mm
Vane Number: N/A

Coordinates E: -45.08838
(NZTM) N: 169.16722
Elevation (mRL): 269
Elevation Datum: NZTM

Maximum Depth: 2 m
Survey Method: Leica FLX100
Start Date: 14/10/2021
Finish Date: 14/10/2021
Logged By: RD
Reviewed By:

Elevation (mRL)	Geological Unit	Excavatability (relative scale) Easier – Harder	DESCRIPTION (SOIL: Classification, colour, consistency / density, moisture, plasticity, additional features (grain size, roundness, composition etc. as applicable))	Depth (m BGL)	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density	Sample	Testing / Additional Comments
	TS		TOPSOIL							
			Silty fine SAND; light brown, homogenous. Medium dense; dry; poorly graded [ALLUVIUM]	0.5						
268	ALLUVIUM		Fine to medium SAND with some gravel and trace cobbles; brown. Medium dense to dense; dry; well graded; gravel, fine to coarse, subrounded, moderately weathered schist. Maximum particle size 60 mm [ALLUVIUM].	1.0			D	MD to D		
				1.5						
267			Depth of Excavation: 2 m Termination Condition: Practical refusal	2.0						

Dynamic Cone Penetrometer

Blows per 100mm

2 4 6 8 10 12

>>

>>

DRAFT

Photos / Sketches

Refused on hard material

ENGEO

Test Pit Log

Client: Searell Jones
Project: Lot 4 Water Race Hill
Location: Bannockburn
Project Number: 19377

Hole I.D:
WRH-ENG21-TP02

Method: Bucket Excavator
Contractor: Donerite
Operator: Chase
Equipment: 10t Excavator
Bucket Size: mm
Vane Number: N/A

Coordinates E: -45.08756
(NZTM) N: 169.1682
Elevation (mRL): 268
Elevation Datum: NZTM

Maximum Depth: 1 m
Survey Method: Leica FLX100
Start Date: 14/10/2021
Finish Date: 14/10/2021
Logged By: RD
Reviewed By:

Elevation (mRL)	Geological Unit	Excavatability (relative scale) Easier – Harder	DESCRIPTION (SOIL: Classification, colour, consistency / density, moisture, plasticity, additional features (grain size, roundness, composition etc. as applicable)	Depth (m BGL)	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density	Sample	Testing / Additional Comments
	TS		TOPSOIL					MD		
	SCHIST		Highly weathered, foliated, brown / orange, SCHIST; very weak; foliation dips 18 degrees to the south [SCHIST].	0.5			D	VW		
267			Moderately to slightly weathered, grey, SCHIST; weak to moderately strong [SCHIST].	1.0				W to MS		

Depth of Excavation: 1 m
Termination Condition: Practical refusal

Dynamic Cone Penetrometer
Blows per 100mm
2 4 6 8 10 12 >>

DRAFT

Photos / Sketches

Refused on hard material

ENGEO

Test Pit Log

Client: Searell Jones
Project: Lot 4 Water Race Hill
Location: Bannockburn
Project Number: 19377

Hole I.D:
WRH-ENG21-TP03

Method: Bucket Excavator
Contractor: Donerite
Operator: Chase
Equipment: 10t Excavator
Bucket Size: mm
Vane Number: N/A

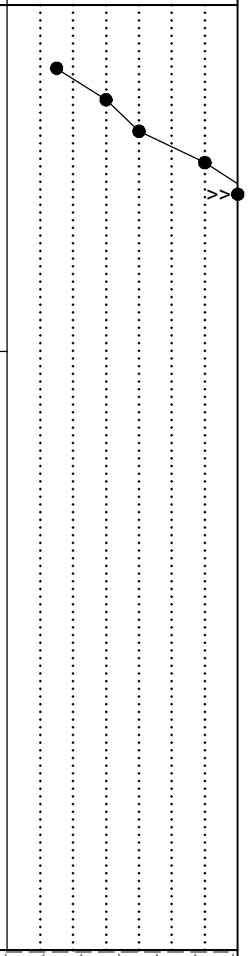
Coordinates E: -45.08738
(NZTM) N: 169.16739
Elevation (mRL): 272
Elevation Datum: NZTM

Maximum Depth: 1.1 m
Survey Method: Leica FLX100
Start Date: 14/10/2021
Finish Date: 14/10/2021
Logged By: RD
Reviewed By:

Elevation (mRL)	Geological Unit	Excavatability (relative scale) Easier – Harder	DESCRIPTION (SOIL: Classification, colour, consistency / density, moisture, plasticity, additional features (grain size, roundness, composition etc. as applicable)	Depth (m BGL)	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density	Sample	Testing / Additional Comments
			TOPSOIL							
	LACUSTRINE		Silty fine SAND; light brown, homogenous. Medium dense; dry; poorly graded [LACUSTRINE].					MD		
	SCHIST		Highly weathered, foliated, brown / orange SCHIST; very weak [SCHIST].	0.5			D	VW		
271			Moderately to slightly weathered, grey SCHIST; weak to moderately strong [SCHIST].	1.0				W to MS		

Depth of Excavation: 1.1 m
Termination Condition: Practical refusal

Dynamic Cone Penetrometer
Blows per 100mm
2 4 6 8 10 12



DRAFT

Photos / Sketches

Refused on hard material

TEST PIT LOG (NZ) TP LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 29/11/21

ENGEO

Test Pit Log

Client: Searell Jones
Project: Lot 4 Water Race Hill
Location: Bannockburn
Project Number: 19377

Hole I.D:
WRH-ENG21-TP04

Method: Bucket Excavator
Contractor: Donerite
Operator: Chase
Equipment: 10t Excavator
Bucket Size: mm
Vane Number: N/A

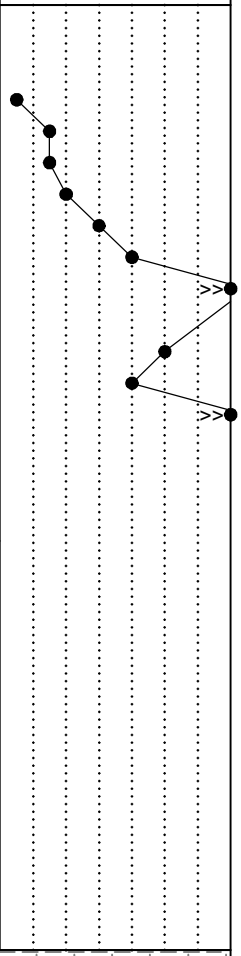
Coordinates E: -45.0876
(NZTM) N: 169.1666
Elevation (mRL): 272
Elevation Datum: NZTM

Maximum Depth: 1.7 m
Survey Method: Leica FLX100
Start Date: 14/10/2021
Finish Date: 14/10/2021
Logged By: RD
Reviewed By:

Elevation (mRL)	Geological Unit	Excavatability (relative scale) Easier–Harder	DESCRIPTION (SOIL: Classification, colour, consistency / density, moisture, plasticity, additional features (grain size, roundness, composition etc. as applicable)	Depth (m BGL)	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density	Sample	Testing / Additional Comments
	TS		TOPSOIL							
	LACUSTRINE		Silty fine SAND; light brown, homogenous. Medium dense; dry; poorly graded [LACUSTRINE].	0.5				MD		
271	SCHIST		Highly weathered, foliated, brown SCHIST; very weak [SCHIST].	1.0			D	VW		
			Moderately to slightly weathered, grey, SCHIST; weak to moderately strong [SCHIST].	1.5				W to MS		

Depth of Excavation: 1.7 m
Termination Condition: Practical refusal

Dynamic Cone Penetrometer
Blows per 100mm
2 4 6 8 10 12



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Photos / Sketches

Refused on hard material

TEST PIT LOG (NZ) TP LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 29/11/21

ENGEO

Test Pit Log

Client: Searell Jones
Project: Lot 4 Water Race Hill
Location: Bannockburn
Project Number: 19377

Hole I.D:
WRH-ENG21-TP05

Method: Bucket Excavator
Contractor: Donerite
Operator: Chase
Equipment: 10t Excavator
Bucket Size: mm
Vane Number: N/A

Coordinates E: -45.08806
(NZTM) N: 169.16707
Elevation (mRL): 272
Elevation Datum: NZTM

Maximum Depth: 1.3 m
Survey Method: Leica FLX100
Start Date: 14/10/2021
Finish Date: 14/10/2021
Logged By: RD
Reviewed By:

Elevation (mRL)	Geological Unit	Excavatability (relative scale) Easier – Harder	DESCRIPTION (SOIL: Classification, colour, consistency / density, moisture, plasticity, additional features (grain size, roundness, composition etc. as applicable)	Depth (m BGL)	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density	Sample	Testing / Additional Comments
	TS		TOPSOIL							
	LACUSTRINE		Silty fine SAND; light brown, homogenous. Medium dense; dry; poorly graded [LACUSTRINE].	0.5			D	MD to D		
271	SCHIST		Highly weathered, foliated, brown SCHIST; very weak [SCHIST].	1.0				VW		
			Depth of Excavation: 1.3 m Termination Condition: Practical refusal							

Dynamic Cone Penetrometer

Blows per 100mm

2 4 6 8 10 12

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DRAFT

Photos / Sketches

Refused on hard material

ENGEO

Test Pit Log

Client: Searell Jones
Project: Lot 4 Water Race Hill
Location: Bannockburn
Project Number: 19377

Hole I.D:
WRH-ENG21-TP06

Method: Bucket Excavator
Contractor: Donerite
Operator: Chase
Equipment: 10t Excavator
Bucket Size: mm
Vane Number: N/A

Coordinates E: -45.08718
(NZTM) N: 169.1661
Elevation (mRL): 270
Elevation Datum: NZTM

Maximum Depth: 2.5 m
Survey Method: Leica FLX100
Start Date: 14/10/2021
Finish Date: 14/10/2021
Logged By: RD
Reviewed By:

Elevation (mRL)	Geological Unit	Excavatability (relative scale) Easier–Harder	DESCRIPTION (SOIL: Classification, colour, consistency / density, moisture, plasticity, additional features (grain size, roundness, composition etc. as applicable)	Depth (m BGL)	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density	Sample	Testing / Additional Comments	Dynamic Cone Penetrometer Blows per 100mm (2 4 6 8 10 12)
	TS		TOPSOIL								
			Fine SAND with some silt and minor gravel; light brown. Medium dense; dry; poorly graded; gravel, fine to medium, subangular. Maximum particle size 15 mm [ALLUVIUM].	0.5				MD			
269	ALLUVIUM		Gravelly fine to coarse SAND; light brown. Dense; dry; well graded; thinly bedded; gravel, fine to coarse, subangular [ALLUVIUM].	1.0			D	MD to D			>>
268				1.5							>>
				2.0							
				2.5							

Depth of Excavation: 2.5 m
Termination Condition: Target depth

DRAFT

Photos / Sketches

ENGEO

Test Pit Log

Client: Searell Jones
Project: Lot 4 Water Race Hill
Location: Bannockburn
Project Number: 19377

Hole I.D:
WRH-ENG21-TP07

Method: Bucket Excavator
Contractor: Donerite
Operator: Chase
Equipment: 10t Excavator
Bucket Size: mm
Vane Number: N/A

Coordinates E: -45.08674
(NZTM) N: 169.16677
Elevation (mRL): 268
Elevation Datum: NZTM

Maximum Depth: 2.4 m
Survey Method: Leica FLX100
Start Date: 14/10/2021
Finish Date: 14/10/2021
Logged By: RD
Reviewed By:

Elevation (mRL)	Geological Unit	Excavatability (relative scale) Easier – Harder	DESCRIPTION (SOIL: Classification, colour, consistency / density, moisture, plasticity, additional features (grain size, roundness, composition etc. as applicable)	Depth (m BGL)	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density	Sample	Testing / Additional Comments	Dynamic Cone Penetrometer Blows per 100mm (2 4 6 8 10 12)
	TS		TOPSOIL								
			Fine SAND with some silt and minor gravel; light brown. Medium dense; dry; poorly graded; gravel, fine to medium, subangular. Maximum particle size 15 mm [ALLUVIUM].	0.5				MD			
267	ALLUVIUM		Gravelly fine to coarse SAND; light brown. Dense; dry; well graded; thinly interbedded; gravel, fine to coarse, subrounded [ALLUVIUM].	1.0			D				>>
				1.5				D			>>
266				2.0							
			Depth of Excavation: 2.4 m Termination Condition: Target depth								

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Photos / Sketches

ENGEO

Test Pit Log

Client: Searell Jones
Project: Lot 4 Water Race Hill
Location: Bannockburn
Project Number: 19377

Hole I.D:
WRH-ENG21-TP08

Method: Bucket Excavator
Contractor: Donerite
Operator: Chase
Equipment: 10t Excavator
Bucket Size: mm
Vane Number: N/A

Coordinates E: -45.08629
(NZTM) N: 169.16807
Elevation (mRL): 274
Elevation Datum: NZTM

Maximum Depth: 0.9 m
Survey Method: Leica FLX100
Start Date: 14/10/2021
Finish Date: 14/10/2021
Logged By: RD
Reviewed By:

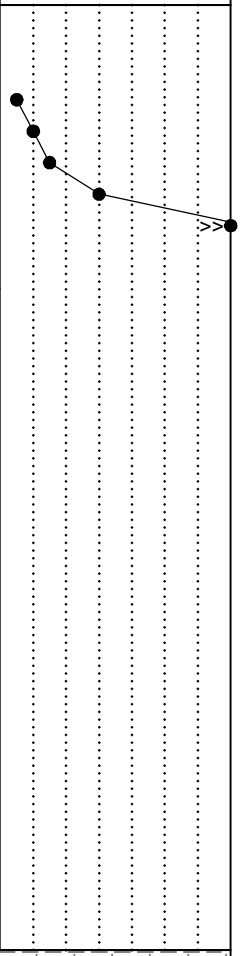
Elevation (mRL)	Geological Unit	Excavatability (relative scale) Easier / Harder	DESCRIPTION (SOIL: Classification, colour, consistency / density, moisture, plasticity, additional features (grain size, roundness, composition etc. as applicable)	Depth (m BGL)	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density	Sample	Testing / Additional Comments
	TS		TOPSOIL							
	LACUSTRINE		Silty fine SAND; light brown, homogenous. Medium dense; dry; poorly graded [LACUSTRINE].	0.5			D	MD		
	SCHIST		Moderately to slightly weathered, foliated, grey SCHIST; moderately strong [SCHIST]					MS		

Depth of Excavation: 0.9 m
Termination Condition: Practical refusal

Dynamic Cone Penetrometer

Blows per 100mm

2 4 6 8 10 12



DRAFT

Photos / Sketches

Refused on hard material

TEST PIT LOG (NZ) TP LOGS.GPJ NZ MASTER DATA TEMPLATE.GDT 29/11/21

ENGEO

Test Pit Log

Client: Searell Jones
Project: Lot 4 Water Race Hill
Location: Bannockburn
Project Number: 19377

Hole I.D:
WRH-ENG21-TP09

Method: Bucket Excavator
Contractor: Donerite
Operator: Chase
Equipment: 10t Excavator
Bucket Size: mm
Vane Number: N/A

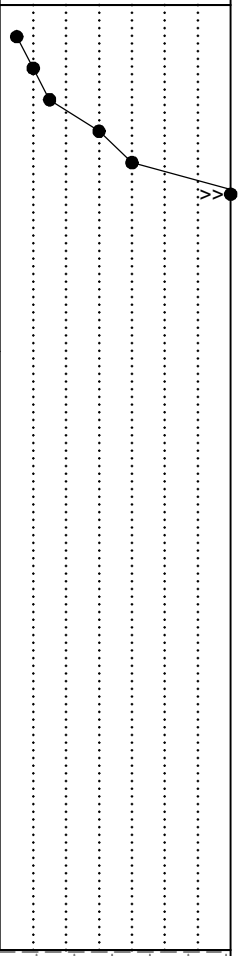
Coordinates E: -45.08656
(NZTM) N: 169.16757
Elevation (mRL): 272
Elevation Datum: NZTM

Maximum Depth: 1.1 m
Survey Method: Leica FLX100
Start Date: 14/10/2021
Finish Date: 14/10/2021
Logged By: RD
Reviewed By:

Elevation (mRL)	Geological Unit	Excavatability (relative scale) Easier–Harder	DESCRIPTION (SOIL: Classification, colour, consistency / density, moisture, plasticity, additional features (grain size, roundness, composition etc. as applicable)	Depth (m BGL)	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density	Sample	Testing / Additional Comments
	TS		TOPSOIL							
	LACUSTRINE		Silty fine SAND; light brown, homogenous. Medium dense; dry; poorly graded [LACUSTRINE].	0.5			D	MD		
	SCHIST		Highly weathered, foliated, brown / orange SCHIST; very weak; foliation dips 22 degrees south [SCHIST].					VW		
271	SCHIST		Moderately to slightly weathered, foliated, grey, SCHIST; weak to moderately strong [SCHIST].	1.0				W to MS		

Depth of Excavation: 1.1 m
Termination Condition: Practical refusal

Dynamic Cone Penetrometer
Blows per 100mm
2 4 6 8 10 12



DRAFT

Photos / Sketches

Refused on hard material

ENGEO

Test Pit Log

Client: Searell Jones
Project: Lot 4 Water Race Hill
Location: Bannockburn
Project Number: 19377

Hole I.D:
WRH-ENG21-TP10

Method: Bucket Excavator
Contractor: Donerite
Operator: Chase
Equipment: 10t Excavator
Bucket Size: mm
Vane Number: N/A

Coordinates E: -45.08642
(NZTM) N: 169.16636
Elevation (mRL): 265
Elevation Datum: NZTM

Maximum Depth: 2.5 m
Survey Method: Leica FLX100
Start Date: 14/10/2021
Finish Date: 14/10/2021
Logged By: RD
Reviewed By:

Elevation (mRL)	Geological Unit	Excavatability (relative scale) Easier / Harder	DESCRIPTION (SOIL: Classification, colour, consistency / density, moisture, plasticity, additional features (grain size, roundness, composition etc. as applicable)	Depth (m BGL)	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density	Sample	Testing / Additional Comments	Dynamic Cone Penetrometer Blows per 100mm (2 4 6 8 10 12)
	TS		TOPSOIL								
	LACUSTRINE		Sandy SILT; yellowish brown, homogenous. Very stiff, dry, low plasticity, moderately sensitive, friable [LACUSTRINE].	0.5			D	VSt			>>
264				1.0							>>
				1.5							
263				2.0							
				2.5							

Depth of Excavation: 2.5 m
Termination Condition: Target depth

DRAFT

Photos / Sketches

ENGEO

Test Pit Log

Client: Searell Jones
Project: Lot 4 Water Race Hill
Location: Bannockburn
Project Number: 19377

Hole I.D:
WRH-ENG21-TP11

Method: Bucket Excavator
Contractor: Donerite
Operator: Chase
Equipment: 10t Excavator
Bucket Size: mm
Vane Number: N/A

Coordinates E: -45.08748
(NZTM) N: 169.16678
Elevation (mRL): 269
Elevation Datum: NZTM

Maximum Depth: 1.6 m
Survey Method: Leica FLX100
Start Date: 14/10/2021
Finish Date: 14/10/2021
Logged By: RD
Reviewed By:

Elevation (mRL)	Geological Unit	Excavatability (relative scale) Easier – Harder	DESCRIPTION (SOIL: Classification, colour, consistency / density, moisture, plasticity, additional features (grain size, roundness, composition etc. as applicable)	Depth (m BGL)	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density	Sample	Testing / Additional Comments
	TS		TOPSOIL							
	LACUSTRINE		Silty fine SAND; light brown, homogenous. Medium dense; dry; poorly graded [LACUSTRINE].	0.5				MD		
268	SCHIST		Highly to moderately weathered, brown / orange SCHIST; very weak to weak. Some of rock mass has weathered to Sandy fine to coarse GRAVEL; Medium dense; dry; well graded; subangular; sand, fine to coarse [SCHIST]	1.0			D	VW to W		
			Depth of Excavation: 1.6 m Termination Condition: Practical refusal	1.5						

Dynamic Cone Penetrometer

Blows per 100mm

2 4 6 8 10 12

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DRAFT

Photos / Sketches

Refused on hard material

ENGEO

Hand Auger Log

Client: Searell Jones
Project: Lot 4 Water Race Hill
Location: Bannockburn
Project Number: 19377

Hole I.D:
WRH-ENG21-HA01

Method: Hand Auger
Contractor:
Operator:
Equipment:
Hole Size: 75 mm mm
Vane Number: N/A

Coordinates E: -45.0882
(NZTM) N: 169.1678
Elevation (mRL): 266
Elevation Datum: NZTM

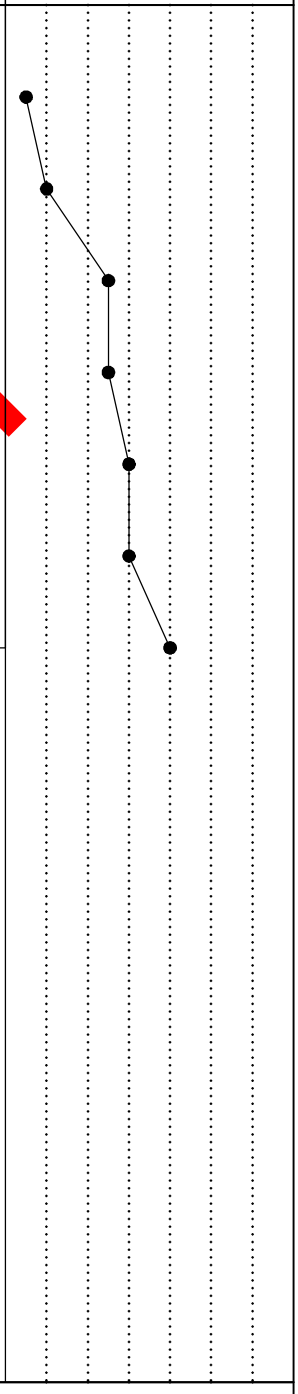
Total Depth: 0.7 m
Survey Method: Leica FLX100
Start Date: 24/11/2021
Finish Date: 24/11/2021
Logged By: RD
Reviewed By:

Elevation (mRL)	Geological Unit	DESCRIPTION (SOIL: Classification, colour, consistency / density, moisture, plasticity, additional features (grain size, roundness, composition etc. as applicable))	Depth (m BGL)	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density	Sample	Testing / Additional Comments
	TS	TOPSOIL							
	LACUSTRINE	Silty fine SAND; light brown. Medium dense; dry; poorly graded; friable, [LACUSTRINE].				D	MD		
265.5		at 0.5 m depth: with minor fine to medium gravel; subangular to subrounded, moderately weathered schist	0.5						
		End of Hole Depth: 0.7 m Termination Condition: Practical refusal							

Dynamic Cone Penetrometer

Blows per 100mm

2 4 6 8 10 12



DRAFT

Refused on infered bedrock

ENGEO

Hand Auger Log

Client: Searell Jones
Project: Lot 4 Water Race Hill
Location: Bannockburn
Project Number: 19377

Hole I.D:
WRH-ENG21-HA02

Method: Hand Auger
Contractor:
Operator:
Equipment:
Hole Size: 75 mm mm
Vane Number: N/A

Coordinates E: -45.08825
(NZTM) N: 169.16784
Elevation (mRL): 266
Elevation Datum: NZTM

Total Depth: 0.3 m
Survey Method: Leica FLX100
Start Date: 24/11/2021
Finish Date: 24/11/2021
Logged By: RD
Reviewed By:

Elevation (mRL)	Geological Unit	DESCRIPTION (SOIL: Classification, colour, consistency / density, moisture, plasticity, additional features (grain size, roundness, composition etc. as applicable))	Depth (m BGL)	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density	Sample	Testing / Additional Comments	Dynamic Cone Penetrometer (Blows per 100mm)
	TS	TOPSOIL								
	COLLUVIUM	Silty fine SAND; light brown. Medium dense; dry; poorly graded; friable, [COLLUVIUM].				D	MD			
		End of Hole Depth: 0.3 m Termination Condition: Practical refusal								

2 4 6 8 10 12

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DRAFT

Refused on infered bedrock

ENGEO

Hand Auger Log

Client: Searell Jones
Project: Lot 4 Water Race Hill
Location: Bannockburn
Project Number: 19377

Hole I.D:
WRH-ENG21-HA03

Method: Hand Auger Contractor: Operator: Equipment: Hole Size: 75 mm mm Vane Number: N/A	Coordinates E: -45.08827 (NZTM) N: 169.167893 Elevation (mRL): 266 Elevation Datum: NZTM	Total Depth: 1 m Survey Method: Leica FLX100 Start Date: 24/11/2021 Finish Date: 24/11/2021 Logged By: RD Reviewed By:

Elevation (mRL)	Geological Unit	DESCRIPTION SOIL: Classification, colour, consistency / density, moisture, plasticity, additional features (grain size, roundness, composition etc. as applicable)	Depth (m BGL)	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density	Sample	Testing / Additional Comments	Dynamic Cone Penetrometer Blows per 100mm 2 4 6 8 10 12
	TS	TOPSOIL								
265.5	COLLUVIUM	Silty fine Sand; light brown. Medium dense; dry; poorly graded; friable, [COLLUVIUM]. at 0.4 m depth: with fine to medium gravel; subangular, moderately weathered schist	0.5			D	MD			
265.0		End of Hole Depth: 1 m Termination Condition: Practical refusal	1.0							>>

DRAFT

Refused on infered bedrock

ENGEO

Hand Auger Log

Client: Searell Jones
Project: Lot 4 Water Race Hill
Location: Bannockburn
Project Number: 19377

Hole I.D:
WRH-ENG21-HA04

Method: Hand Auger
Contractor:
Operator:
Equipment:
Hole Size: 75 mm mm
Vane Number: N/A

Coordinates E: -45.088362
(NZTM) N: 169.168055
Elevation (mRL): 266
Elevation Datum: NZTM

Total Depth: 0.8 m
Survey Method: Leica FLX100
Start Date: 24/11/2021
Finish Date: 24/11/2021
Logged By: RD
Reviewed By:

Elevation (mRL)	Geological Unit	DESCRIPTION (SOIL: Classification, colour, consistency / density, moisture, plasticity, additional features (grain size, roundness, composition etc. as applicable))	Depth (m BGL)	Graphic Symbol	Water Level	Moisture Cond.	Consistency/ Density	Sample	Testing / Additional Comments
	TS	TOPSOIL							
265.5	LACUSTRINE	Silty fine SAND; light brown. Medium dense; dry; poorly sorted; friable, [LACUSTRINE].	0.5			D	MD		
		at 0.6 m depth: fine to medium gravel; subangular to subrounded, moderately weathered schist							
		End of Hole Depth: 0.8 m Termination Condition: Practical refusal							

Dynamic Cone Penetrometer

Blows per 100mm

2 4 6 8 10 12

>>

DRAFT

Refused on infered bedrock

APPENDIX 3:

Interpreted Geologic Cross Section

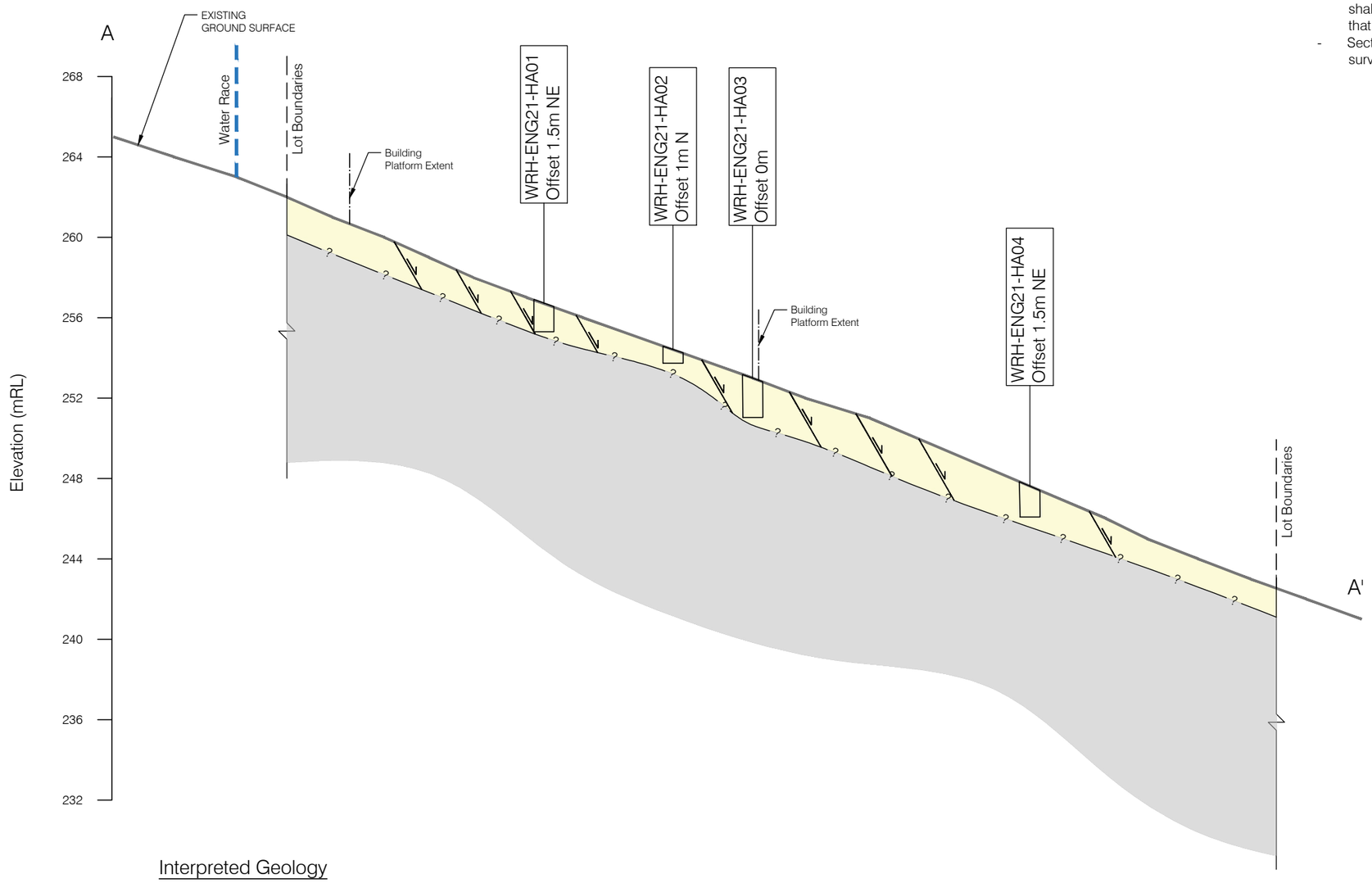
DRAFT

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DATE PLOTTED: 3 December 2021 1:29 AM BY: CAROLINE DJERDJERIAN

Notes:

- Subsurface profile inferred from site observations and shallow soil testing. Actual conditions may vary from that shown.
- Section profile generated from 2016 drone survey completed by Land Pro Ltd. A & A' Section



Interpreted Geology

- Lacustrine derived Colluvium(Silty Fine Sand, medium dense)
- Schist Bedrock
- —— ? —— Inferred Contact
- Indicative Creep Movement

CROSS SECTION A-A'
SCALES 1:250

Rev	Date	Description	Drwn	Chkd
A	25.11.21	Draft for review	CD	-

DRAFT

ENGEO

Queenstown Office
25 Glenda Drive
Frankton
Queenstown 9300
Tel: 03 328 9012,
www.engeo.co.nz

Title: Interpreted Geological Cross Section

Client: D J Jones Family Trust & Searell Family Trust
Project: Lot 4 Water Race Hill
Designed: RD
Drawn: CD
Checked: -
Date: 25.11.21
Proj No: 19377
Scale: 1:250
Appendix: 3
Size: A3
Rev: A

CAD File: Z:\Drafting\19001 to 20000\19377- Water Race Hill\19377-Water Race Hill-XSection-1121.dwg
XREF's:

ORIGINAL FIGURE PRINTED IN COLOUR

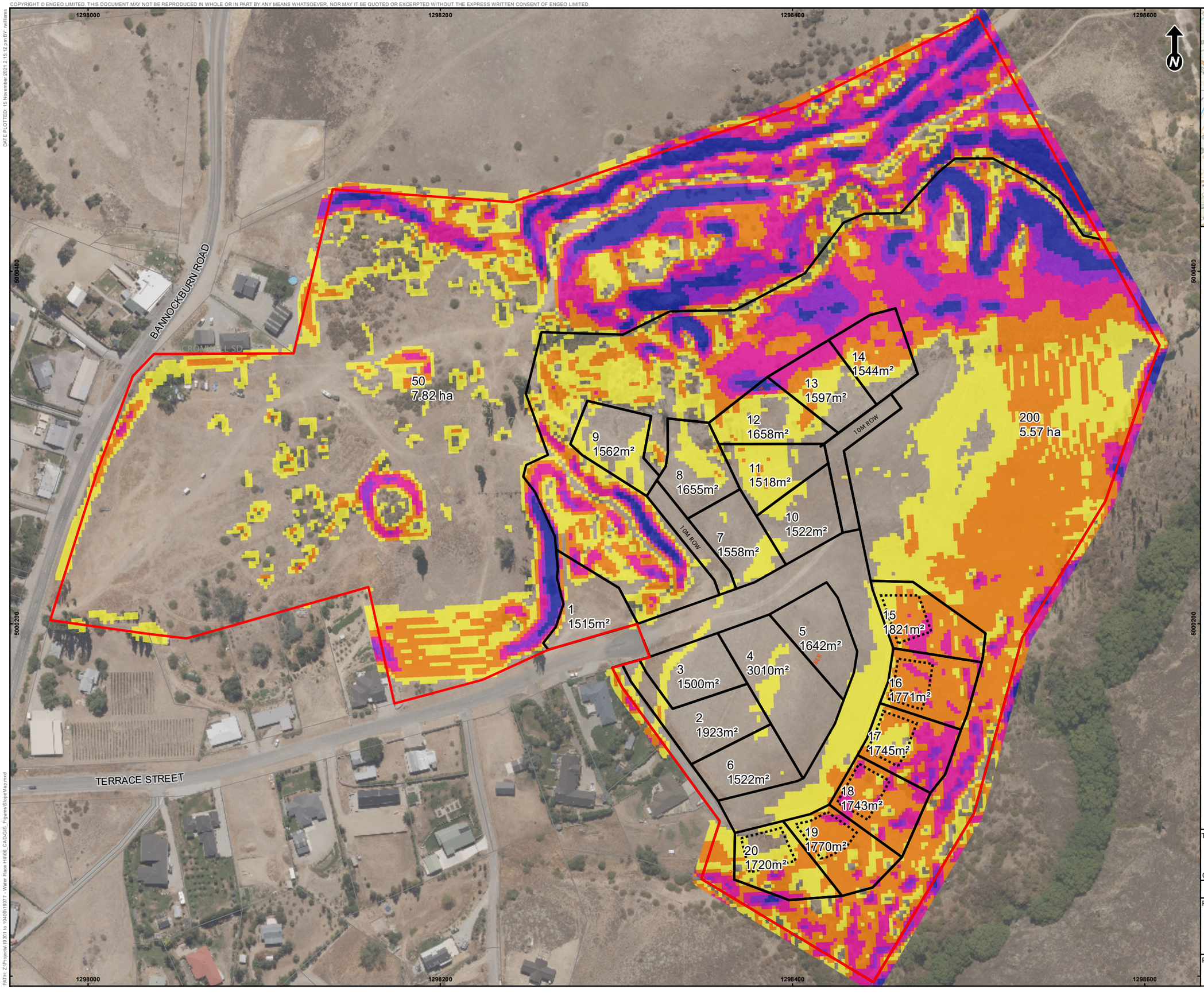
APPENDIX 4:

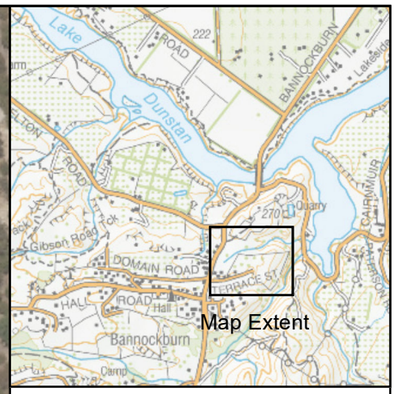
Slope Hazard Assessment

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DATE PLOTTED: 15 November 2021 2:15:12 pm BY: rwilliams





Legend

- Site outline
- Existing property title boundary
- Building Platform
- Subdivision Lot Boundary

Slope

- <10 degrees
- 10 – 17.5 degrees
- 17.5 – 25 degrees
- 25 – 32.5 degrees
- 32.5 – 37.5
- >37.5 deg

Aerial: LINZ and Eagle Technology, CC BY 4.0.
Map image: Eagle Technology.
Elevation Data: LandPro Sep 2016
Proposed subdivision: Adapted from Rough Milne Mitchell.

0 50 100
Metres

PROJECTION: NZGD 2000 New Zealand Transverse Mercator

Queenstown Office
25 Glenda Drive, Frankton, Queenstown 9300
Tel: 03 328 9012, www.engeo.co.nz

Title: Site Slope Plan

Client: DJ Jones Family Trust & Searell Family Trust No. 2

Project: Water Race Hill Lot 4 Terrace Street

Designed: RD
Drawn: RW
Checked: XX
Date: Nov 21

Figure No: 1
Size: A3

Proj No: 19377.000.001

Scale: 1:2,000

Revision: A

PATH: Z:\Projects\19301 to 19400\19377 - Water Race Hill\06 CAD-GIS Figures\SlopeMap.mxd

ORIGINAL FIGURE PRINTED IN COLOUR

APPENDIX 5:

Constraint Map

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DATE PLOTTED: 26 November 2021 10:46:50 am BY: rw Iliams

1298000 1298200 1298400 1298600

5000400 5000200

BANNOCKBURN ROAD

TERRACE STREET

CROMWELL SD

LOT 4 DP 339137 (CFR: 474127)

50
7.82 ha

1
1515m²

2
1923m²

3
1500m²

4
3010m²

5
1642m²

6
1522m²

7
1558m²

8
1655m²

9
1562m²

10
1522m²

11
1518m²

12
1658m²

13
1597m²

14
1544m²

15
1821m²

16
1771m²

17
1745m²

18
1743m²

19
1770m²

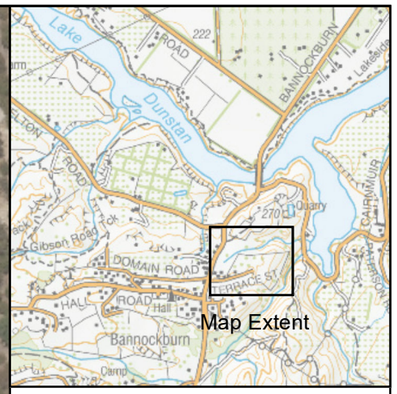
20
1720m²

200
5.57 ha

10M ROW

10M ROW

N



Legend

- Site outline
- Existing property title boundary
- Building Platform
- Subdivision Lot Boundary

Risk Class

- 1
- 2
- 3
- 4
- 5

Aerial: LINZ and Eagle Technology, CC BY 4.0.
Map image: Eagle Technology.
Elevation Data: LandPro Sep 2016
Proposed subdivision: Adapted from Rough Milne Mitchell.

0 50 100
Metres

PROJECTION: NZGD 2000 New Zealand Transverse Mercator

ENGEO

Queenstown Office
25 Glenda Drive, Frankton, Queenstown 9300
Tel: 03 328 9012, www.engeo.co.nz

Title: Development Risk Classes

Client: DJ Jones Family Trust & Searell Family Trust No. 2

Project: Water Race Hill Lot 4 Terrace Street

Designed: RD
Drawn: RW
Checked: XX
Date: Nov 21

Figure No: 2

Size: A3

Proj No: 19377.000.001

Scale: 1:2,000

Revision: A

PATH: Z:\Projects\19301 to 19400\19377 - Water Race Hill\06 CAD-GIS Figures\ConstraintMap.mxd

ORIGINAL FIGURE PRINTED IN COLOUR

APPENDIX 6:

Hillslope Development

DRAFT

Australian Geomechanics Society

Extract from

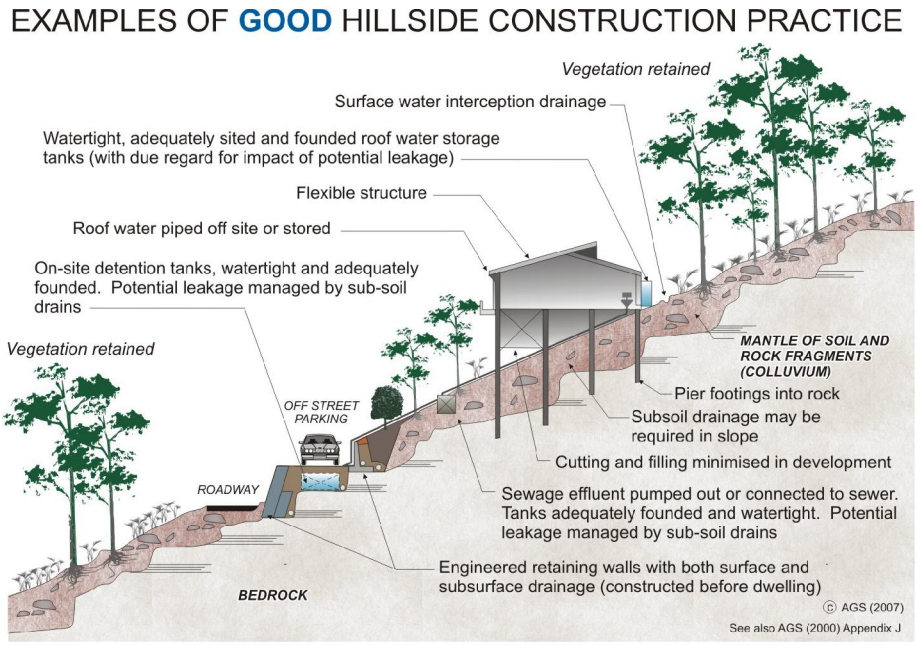
Australian Geomechanics

Journal and News of the Australian Geomechanics Society
Volume 42 No 1 March 2007

Extract containing:

"Practice Note Guidelines for Landslide Risk Management 2007"

Ref: AGS (2007c)



Landslide Risk Management

ENGINEERS AUSTRALIA

AusIMM AUSTRALASIAN INSTITUTE OF MINING & METALLURGY

ISSN 0818-9110

7 August 2023

Searell Family Trust No 2 and Doug Jones Family Trust

C/- Town Planning Group
PO Box 2559
Queenstown, 9348

Attention: Craig Barr

Dear Craig,

Bannockburn Subdivision, Terrace Street, Bannockburn Transport Assessment

The purpose of this letter is to provide a transport assessment for a proposed subdivision of Lot 4 DP339137 to be accessed via Terrace Street, Bannockburn.

1 Background

The Site, Lot 4 DP339137, is accessed from either Bannockburn Road or Terrace Street, Bannockburn. The site is undeveloped.

Under the CODC Operative District Plan (ODP) the site is predominantly within the Residential Resource Area, RRA (4).

2 Transport Network

2.1 Local Road Network

The Site has frontage to Bannockburn Road and Terrace Street. The proposed subdivision area is located in the eastern part of the Site and will be access from Terrace Street.

2.1.1 Bannockburn Road

Bannockburn Road is an urban local road within the ODP road classification[1]. Bannockburn Road has a current (estimated) traffic flow of 1,500vpd[2] serving the urban area of Bannockburn and the rural land to the south of Bannockburn. At the site, and at the intersection with Terrace Street, Bannockburn Road is formed with two traffic lanes on a 7.0m sealed carriageway width. Bannockburn Road has a speed limit of 50km/hr posted as you enter Bannockburn, the general straight alignment of Bannockburn Road suggests a likely operating speed of less than 60km/hr.

2.1.2 Terrace Street

The site is accessed from the existing cul-de-sac end of Terrace Street which is also an urban local road within the ODP road classification[3]. Terrace Street has a current (estimated) traffic

[1] Refer CODC District Plan, Schedule 19.7: Roading Classification.
[2] From Mobile Road (mobileroad.org) estimated traffic flow of 1,500vpd with 8% heavy vehicles dated 18/05/2020.
[3] Refer CODC District Plan, Schedule 19.7: Roading Classification.

flow of 97vpd[4] serving the residential properties on each side. Given the number of residential properties served it is likely that the current (2023) traffic flow on Terrace Street will be closer to 200vpd. Terrace Street is formed with two traffic lanes on a 7.0m sealed carriageway width. The speed limit of Terrace Street is 50km/hr, based on the roadside residential activity it is likely that the operating speed will be approximately 50km/hr to match the speed limit.

2.2 Public Transport

There are no public transport services that serve Bannockburn although there are school bus services between Bannockburn and the Schools, primary and secondary, which are located in Cromwell.

2.3 Walking and Cycling

Within Bannockburn there are no formal cycle trails and cyclists are expected to share the road with vehicles within the 50km/hr speed limit.

A recent pedestrian and cycle path has been constructed adjacent to Bannockburn Road providing a pedestrian and cycle connection between Felton Road and Cromwell, it is expected that this trail will be extended into Bannockburn in the near future. This trail also links with the Cromwell to Clyde leisure trail which is part of the Clutha River Trails.

Footpaths are provided on Bannockburn Road and other streets within Bannockburn, these are provided on one side only. These is no footpath provided on Terrace Street, on this road pedestrians (and cyclists) are expected to share the road with vehicles.

There are informal pedestrian and cycle trails running through the site, this includes a link through the northern portion of the site between Bannockburn Road and the Bannockburn Inlet (Lake Dunstan and Cairnmuir Road). This trail has no legal corridor and is reliant on access over land owned by others outside of the site.

3 Proposed Development

It is proposed to subdivide the site to create the following:

- 20 residential lots – Lots 1-20,
- A recreation reserve/lookout – Lot 30,
- 3 balance lots to be retained for future development – Lots 40, 50 & 51, and
- 2 access lots which will be formed as roads to be vested with CODC – Lots 100 & 101.

The proposed development will include a number of private shared access Right of Way (ROW) to serve specific lots.

3.1 Traffic Generation

The proposed subdivision will create 20 residential lots, the proposed development may generate up to 164 vehicles per day (vpd) including a peak hour traffic flow of up to 18 vehicles per hour (vph)[5].

---

[4] From Mobile Road (mobileroad.org) estimated traffic flow of 97vpd with 2% heavy vehicles dated 10/10/2016.

[5] Base on NZTA Research Report (RR453) Trips and Parking Related to Land Use, Table 7.4 Summary of design trips and parking demand in NZ in 2010. Dwelling (outer Suburban) 0.9vph/unit, 8.2vpd/unit. Calculations are based on 20 total residential dwellings, one per lot.

3.2 Site Access

The site is accessed via the extension of Terrace Street beyond the current cul-de-sac end. The proposed development will add additional vehicle trips to Terrace Street and at the Terrace Street intersection with Bannockburn Road.

4 District Plan

The CODC ODP, Section 12 District Wide Rules and Performance Standards, provides rules to manage potential transport effects within the residential zones. The access rule, Access Standards from Roads (rule 12.7.1) provide a framework for advice relating to the site access from Terrace Street and for access to individual lots. Based on the ODP rules the following advice is provided:

- Construction and Maintenance, 12.7.1 (i) – That any vehicle crossing (including private shared access ROW) should have a sealed surface and the access is formed to meet the requirement of a Right of Way[6] which are to intersect the road boundary within 15 degrees of a right angle. The vehicle crossing must not impede or restrict roadside drainage facilities.
- Sight Distance, 12.7.1 (ii) – That any vehicle crossing (including private shared access ROW) should have 40m sight distance in each direction based on the 50km/hr speed limit.
- Access to Urban Local Roads, 12.7.1 (vii) – That any vehicle crossing (including private shared access ROW) are to have a sealed surface (similar to the adjacent road).

Breaches of the ODP rules (above) will result in a discretionary (restricted) activity status (refer 12.7.1 (viii) Breach of Standards). Any potential breaches and their potential transport effects are discussed in the following section. Any potential breaches of these rules may be minimised or avoided through detailed design, as recommended in the following section.

5 Transport Effects

The greatest transport effect is likely to be a result of increased traffic in the local road network as a result of the proposed 20 residential lots (residential dwellings).

5.1 Off-Site Transport Effects

5.1.1 Bannockburn Road Intersection

Terrace Street is accessed from Bannockburn Road, this intersection has been formed as a basic urban intersection with good sight distance provided in each direction on Bannockburn Road. The traffic volume (current and proposed) using Terrace Street is relatively low. It is expected that this existing intersection formation is appropriate to serve the increased traffic generation of the proposed subdivision. The increased traffic volume at the intersection of Terrace Street with Bannockburn Road is unlikely to have any noticeable effects on the overall intersection efficiency or safety.

5.1.2 Local Road Access, Terrace Street

Terrace Street is formed with two traffic lanes on a 7.0m sealed carriageway width. This sealed carriageway with provides for both traffic and parking. Based on the CODC Addendum to NZS 4404:2004 this road type would be expected to have a sealed carriageway width of 8.5m[7].

---

[6] Refer Central Otago District Council, Addendum to NZS 4404:2004, July 2008.

[7] Refer Central Otago District Council, Addendum to NZS 4404:2004, July 2008. Table 3.1 Road Design Standards – Urban, based on a residential local road serving 21-150 dwelling units.

The roadside residential lots are relatively large which provides sufficient off-street parking and there is no identified, or observed, demand for onstreet car parking. This means that the existing road width is sufficient to accommodate both the current and proposed traffic flow.

The existing Terrace Street has no footpaths which means that pedestrians share the carriageway with vehicles. The existing street includes street lighting which means that pedestrians, and cyclists, who are required to share the carriageway will be visible at night.

5.1.3 Pedestrian access

Based on the CODC Addendum to NZS 4404:2004 Terrace Street would be expected to provide footpaths so that pedestrians are not required to share the road with vehicles. Given that the assessed operating speed is approximately 50km/hr it is recommended that a footpath is provided within the existing Terrace Street road corridor so that pedestrians are not required to share the carriageway with vehicles. It is recommended that the proposed development includes a single 1.5m footpath is recommended along the full length of the existing Terrace Street. Ideally, this footpath would be provided on the northern side and will include a footpath crossing over Bannockburn Road to allow pedestrians to access the existing footpath network on the western side of Bannockburn Road. This recommended footpath will improve overall pedestrian safety within Terrace Street and allow for increased traffic as a result of the proposed subdivision.

5.1.4 Vehicle Crossings

Lot 1 and the shared (existing) access ROW (Lots 2, 3 & 6 Lot 36 DP339137) will have vehicle crossings directly from the existing Terrace Street. The vehicle crossing for the shared access ROW (Lots 2, 3 & 6 Lot 36 DP339137) will remain unchanged.

A new vehicle crossing is to be formed to Lot 1, this vehicle crossings can be constructed at any location along the frontage length and will comply with the ODP requirements with respect to construction, crossing angle and sight distance. This vehicle crossings does not need to be formed at a subdivision stage and may remain unformed, with consent conditions or advice notice, for the location to be determined by future owners as this lot is developed for residential activities.

5.2 Onsite Transport Effects

5.2.1 Internal Roads

The onsite traffic effects can be managed through the design process. The CODC Addendum to NZS 4404:2004 identifies the minimum design requirements for new road. The development drawings provide a structure and context for the provision of new internal roads and identify the position of vehicle crossings.

The internal road network is to be designed and constructed in accordance with the Addendum to 4404:2004, Table 1 provides an overview of the proposed internal access road network. This onsite road network, Lots 100 & 101, are expected to be vested with CODC.

Table 1 – Roads, Compliance with CODC Addendum to NZS 4404:2004

Subdivision Access Road	CODC Requirement	Specific Details
Lot 101 – Terrace Street extension. Provides access to a maximum of 19 onsite lots with possible direct access to 11 lots, Lots 3, 4, 5, 7-9 & 10-14. Other lots will be accessed via Lot 100.	Local Road, Cul-de-sac standard serving up to 20 dwellings.	Constructed as a cul-de-sac with a turning area at the northern/eastern end. Legal road width to be 20m minimum. Sealed carriageway of width of 6m minimum allowing for traffic and parking. Single 1.5m footpath required. Maximum gradient 12.5%, the preliminary design suggests a maximum gradient of 10%. Provision of public parking adjacent to Lots 5 and 30 to serve walking trails in Lots 30 and 40. Street lighting is recommended.
Lot 100 – loop road. Provides access to a maximum of 11 onsite lots, Lots 2-6, & 15-20. Some of these lots may be accessed from Lot 101 or an existing private access ROW.	Local Road, Cul-de-sac standard serving up to 20 dwellings.	Constructed as a loop/through road. Legal road width to be 20m minimum. Sealed carriageway of width of 6m minimum allowing for traffic and parking. Single 1.5m footpath required. Maximum gradient 12.5%, the preliminary design suggests a maximum gradient of 10%. Possible provision of public parking adjacent to Lots 6/20 to serve walking trails in Lot 40. Street lighting is recommended.

These roads can be constructed to comply with the requirements of the CODC Addendum to NZS 4404:2004 providing appropriate internal transport links for vehicles and pedestrians. It is noted that footpaths will connect with off road paths/trails in the recreation reserve, Lot 30, and the balance lot, Lots 40, 50 & 51.

The preliminary design of Lot 100 (loop road) and Lot 101 (Terrace Street extension) will have a tight horizontal curves adjacent to Lot 4 and Lot 10. These curves will have reduced design speeds of approximately 20km/hr and 30km/hr respectively. These areas will have reduced forward sight distance and reduced sight distances at adjacent vehicle crossings. It is anticipated the road the designs will result in an overall operating speed of less than 40km/hr[8] and less than the 50km/hr speed limit.

The proposed onsite road network is appropriate for the urban environment and the number of lots to be served.

5.2.2 Access ROW

A number of lots will be accessed via private access ROW which are to be constructed as part of the subdivision. These access ROW are to be designed and constructed in accordance with

[8] Based on Figure E12 suburban live and play road type from NZ Standards NZS4404:2010, Land Development and Subdivision Infrastructure.

the CODC Addendum to 4404:2004. Table 2 below provides an overview of the proposed private access ROW.

Table 2 – Access ROW, Compliance with CODC Addendum to NZS 4404:2004

Subdivision Access Road	CODC Requirement	Specific Details
Existing ROW, Lots 2, 3 & 6. Provides access to 3 onsite lots (Lots 2, 3 & 6) and existing Lot 36 DP339137.	ROW, 2-4 dwellings.	Legal ROW width will be 6m minimum. Sealed carriageway of width of 4m over a straight length of approximately 100m. Allowable maximum gradient 16%, the existing ROW has a maximum gradient of 12.5%.
Lots 7, 8 & 9 ROW. Provides access to 3 onsite lots.	ROW, 2-4 dwellings.	Legal ROW width will be 6m minimum. Sealed carriageway of width of 4m. Maximum gradient 16%, the preliminary design suggests a maximum gradient of 12.5%.
Lots 15 & 16 ROW. Provides access to 2 onsite lots.	ROW, 2-4 dwellings.	Legal ROW width will be 6m minimum. Sealed carriageway of width of 4m. Maximum gradient 16%, the preliminary design suggests a maximum gradient of 20%.
Lots 17 & 18 ROW. Provides access to 2 onsite lots.	ROW, 2-4 dwellings.	Legal ROW width will be 6m minimum. Sealed carriageway of width of 4m. Maximum gradient 16%, the preliminary design suggests a maximum gradient of 20%.
Lots 19 & 20 ROW. Provides access to 2 onsite lots.	ROW, 2-4 dwellings.	Legal ROW width will be 6m minimum. Sealed carriageway of width of 4m. Maximum gradient 16%, the preliminary design suggests a maximum gradient of 24%.

The preliminary designs of the access ROW shows that the access ROW serving 2 lots (dwellings, Lots 17/18 & 19/20) will breach maximum gradients of the CODC Addendum to NZS 4404:2004. This Addendum requires a maximum gradient of 16% for ROW serving 2 or more dwellings with an allowance for up to 20% when serving only 1 dwelling. The current NZ Standard, NZS4404:2010 Land Development and Subdivision Infrastructure provides design standards for a Figure E1 road type (lane or private way)[9]. In this NZ Standard this road type may serve up to 6 residential dwellings with a maximum gradient of 20% (1 in 5), as private way for residential access (access ROW) the centreline gradient may be modified as: *Not be steeper than 1 in 5 although gradients of 1 in 4.5 may be used on straight lengths of access over distances of up to 20m. The first 5m of any access shall be not steeper than 1 in 8*[10]*.* The NZ Standard provides clear design guidelines with respect to the proposed driveway and private residential access. When considering winter conditions in Central Otago it is recommended that any gradient steeper than 1 in 6 (16.7%) is to include a higher friction surfacing such as exposed aggregate or brushed concrete. Based on the allowances of the

[9] Refer NZ Standard NZS4404:2010 Land Development and Subdivision, Table 3.2 – Road design standards.
[10] From NZ Standard NZS4404:2010 Land Development and Subdivision, Section 3.3.16.1 part (a).

current NZ Standards it is recommended that a suitable design criteria for the access ROW is:

> *That any private access ROW may have a maximum gradient of 1 in 5 (20%). This may be increased to 1 in 4.5 (22.2%) for short straight lengths up to 20m maximum length. Any portion of an access with a gradient greater that 16% is to have a higher friction surfacing such as exposed aggregate or brushed concrete or similar.*

The preliminary design suggests that the maximum access gradients will be within the private lots and is generally a result of maintaining appropriate drainage details as the accesses cross the existing water race structures within Lot 100 (loop road). It is possible that the detailed design will need to manipulate road levels (Lot 100, loop road) and/or building platform heights in order to achieve the recommended maximum access ROW gradients above. It is understood that this is possible.

Overall, it is considered that the proposed subdivision can establish appropriate access ROW design to meet the requirements of the current NZ Standards and will be appropriate for winter conditions in Central Otago.

5.2.3 Vehicle Crossings

The majority of the onsite vehicle crossings can be constructed at any location along the frontage length, the following identifies lots where specific vehicle crossing criteria must be considered:

The preliminary design of Lot 100 (loop road) and Lot 101 (Terrace Street extension) will have a tight horizontal curves adjacent to Lot 4 and Lot 10. These curves will have reduced design speeds, approximately 20km/hr and 30km/hr respectively. The reduced design (operating) speed at these locations will mean that reduced sight distance at the vehicle crossings in these locations will be acceptable. The minimum sight distance requirements of the ODP (12.7.1 (ii) Sight distances) are based on the Guidelines for visibility at driveways[11] and is equivalent to the absolute minimum stopping sight distance (SSD)[12] for the anticipated operating (design) speed. The required sight distance for a 20km/hr operating speed is 12m, or 20m for a 30km/hr operating speed[13]. This suggest that the sight distances for vehicle crossings at these curves may be reduced as follows:

- Lots 4 & 6, if a vehicle crossing is to be located to the south of these lots (from Lot 100) the vehicle crossing is to have a minimum sight distance, towards the curve in Lot 100, of 12m which can be achieved.
- Lots 19/20, The sight distance of this shared vehicle crossing will be restricted by the adjacent curve (Lot 100). This vehicle crossing is to have a minimum sight distance, towards the curve in Lot 100, of 12m which can be achieved.
- Lots 17/18, The sight distance of this shared vehicle crossing will be restricted by the adjacent curve (Lot 100). This vehicle crossing is to have a minimum sight distance, towards the curve in Lot 100, of 12m which can be achieved.

---

[11] Refer Land Transport Safety Authority (now Waka Kotahi, NZTA) RTS 6 Guidelines for visibility at driveways.

[12] Refer Austroads Guide to Road Design, Part 3: Geometric Design, Section 5.3.1 Car Stopping Sight Distance.

[13] Calculated from Austroads Guide to Road Design, Part 3: Geometric Design, Section 5.3 Stopping Sight Distance (SSD), Equation 1 using R_T=1.5 seconds and d=0.46 for the absolute minimum.

To avoid unnecessary conflict at the vehicle crossing it is good practice to separate vehicle crossings for adjacent intersections (Lot 100/101). To mitigate potential conflict the position of a following vehicle crossing is to be restricted:

- Lot 3 – This lot has access via the access ROW, any secondary access must be greater that 15m from the adjacent intersection to achieve desirable intersection separation distances.
- Lot 4 – Any access must be greater that 15m from the adjacent intersection to achieve desirable intersection separation distances.
- Lot 5 – Any access must be greater that 15m from the centre of the adjacent intersection to achieve desirable intersection separation distances.
- Lot 10 – Any access must be greater that 15m from the centre of the adjacent intersection to achieve desirable intersection separation distances.

It is noted that these vehicle crossings do not need to be formed at a subdivision stage and may remain, with consent conditions or advice notice, to be determined by future owners as these lots are developed for residential activities.

vehicle crossings do not need to be formed at a subdivision stage and may remain unformed with consent conditions or advice notice, for the location to be finalised by future owners as the lot is developed for residential activities.

Overall, there are options for the future development of vehicle crossing which means that these can be developed, in the future, to suit the proposed residential development of the lots.

6 Summary

It is proposed to subdivide Lot 4 DP339137 to create 20 residential lots (Lots 1-20) with allowance for access (Lots 100 & 101), reserve (Lot 30) and balance lots. It is expected that each residential lot would be developed as a single residential dwelling unit.

The onsite traffic effects can be managed through the design process. The proposed onsite road network will be designed in accordance with the CODC Addendum to NZS 4404:2004. Access Lots 100 & 101 will be a developed as local roads serving up to 20 residential dwellings with a separate footpath which will also link with proposed off-road paths/trails within Lots 30, 40, 50 & 51.

The shared access ROW have been considered based on their preliminary design information. The gradients of the shared accesses ROW from Lot 100 (loop road) will breach the gradient requirements of the CODC Addendum to NZS 4404:2004. I therefore recommend that the gradient of these shared private access ROW, serving 15/16, 17/18 & 19/20 be design in accordance with the current NZ Standards with the access surfacing amended to accommodate winter conditions in Central Otago, The final design of these shared access ROW may be considered through the engineering approvals process.

Vehicle crossings can be located and designed in accordance with the ODP although it is recommended that the location of some vehicle crossings are restricted, as recommended, for Lots 3, 4, 5 & 10.

The proposed subdivision relies on access from Terrace Street, an urban local road within the CODC road hierarchy. This road is formed with a 7m sealed carriageway width which is appropriate for the anticipated traffic flows. However, to improve pedestrian safety it is recommended that a 1.5m footpath is provided along the full length of Terrace Street with a crossing over Bannockburn Road to meet with the existing footpath on the western side of Bannockburn Road.

Overall, with the recommendations suggested it is considered that the proposed subdivision will not have any adverse transport effects on the safety or efficiency of the adjacent transport network including the local pedestrian and cycling environment.

Should you require any further information please contact me.

Yours sincerely,

Jason Bartlett
CEng MICE, MEngNZ
Transport Engineer

SUBJECT TO RESOURCE CONSENT

Optional/as required silt fence

Compulsory silt fence

Stabilised entrance (indicative location)

Stormwater inlet protection (indicative locations)

Optional/as-required silt fence

1	1910m²	
2	1502m²	
3	1526m²	
4	2266m²	
5	1704m²	
6	1502m²	
7	2038m²	
8	1910m²	
9	1562m²	
10	1522m²	
11	1518m²	
12	1658m²	
13	1597m²	
14	1544m²	
15	820m²	
16	1771m²	
17	1745m²	
18	1743m²	
19	1770m²	
20	1730m²	
30	0.41 Ha	
40	4.44 Ha	
51	0.53 Ha	
100	0.55 Ha	
101	0.47 Ha	

LOT 4 DP 339137 (CFR: 474127)

LOT 33 DP 339137

LOT 36 DP 339137

LOT 17 DP 339137

INDICATIVE EARTHWORKS

CUT/FILL SHOWN IN 0.5m INCREMENTS

TOTAL CUT VOLUME - 2,020m³
TOTAL FILL VOLUME - 1,700m³

APPROX DISTURBED AEA - 10,400m²

Rev.	Date	Revision Details	By
A	25.08.23	UPDATE EARTHWORKS FOR REVISED LOTS	RAF

Surveyed	Signed	Date	Job No.	Drawing No.	
DRONE		SEP 16	S15303	12_01c	
Drawn	Signed	Date	Scale		
RAF		14.02.22	1:1,500 @ A3		
Designed	Signed	Date	Datum & Level	Rev.	
R & M		NOV '21	NZTM 2000 & MSL	A	

ISSUED FOR EROSION & SEDIMENT CONTOL PLANNING 28.08.2023

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Client
JONES SEARELL FAMILY TRUST

NOTES
- All dimensions shown are in metres unless otherwise shown
- Copyright on this drawing is reserved
- Check any electronic data against the hardcopy plan to ensure it is the latest version
-If this plan is being used as part of sale and purchase agreement then it is done so on the basis that it is preliminary only, final dimensions and areas may vary on final survey

INDICATIVE EARTHWORKS PLAN
PROPOSED SUBDIVISION OF LOT 4 DP 339137
TERRACE STREET, BANNOCKBURN

D:\DATA L - Local working\2021\Terrace Street\S15303.12.EWK.dwg Plotted: 28.08.2023

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD

Search Copy

R.W. Muir
Registrar-General
of Land

Identifier **474127**
Land Registration District **Otago**
Date Issued 15 July 2009

Prior References
433928

Estate Fee Simple
Area 17.6140 hectares more or less
Legal Description Lot 4 Deposited Plan 339137
Registered Owners
Alan Bevin McKay as to a 1/2 share
David Riley and Lindsay William Lloyd as to a 1/2 share

Interests

Saving and excepting all minerals within the meaning of the Land Act 1924 on or under part formerly Section 40 Blk I Bannockburn SD

Part formerly Section 40 Block I Bannockburn Survey District is subject to Section 315 Land Act 1924

Subject to Section 8 Mining Act 1971 (affects part formerly Sections 121, 122 & 123 BLK I Cromwell Survey District)

Subject to Section 168A Coal Mines Act 1925 (affects part formerly Sections 121, 122 & 123 BLK I Cromwell Survey District)

Subject to a right (in gross) to drain sewage over part marked A, F DP 339137 and a right (in gross) to drain water over part marked U DP 339137 to Central Otago District Council created by Easement Instrument 6267274.4 - 24.12.2004 at 9:00 am

The easements created by Easement Instrument 6267274.4 are subject to Section 243 (a) Resource Management Act 1991

Subject to a right (in gross) to convey telecommunications and computer media over part marked U, V, F, W DP 339137 to Telecom New Zealand Limited created by Easement Instrument 6267274.5 - 24.12.2004 at 9:00 am

The easements (except computer media) created by Easement Instrument 6267274.5 are subject to Section 243 (a) Resource Management Act 1991

Subject to a right (in gross) to convey electricity over part marked U, V, F, W DP 339137 to Aurora Energy Limited created by Easement Instrument 6267274.6 - 24.12.2004 at 9:00 am

The easements created by Easement Instrument 6267274.6 are subject to Section 243 (a) Resource Management Act 1991

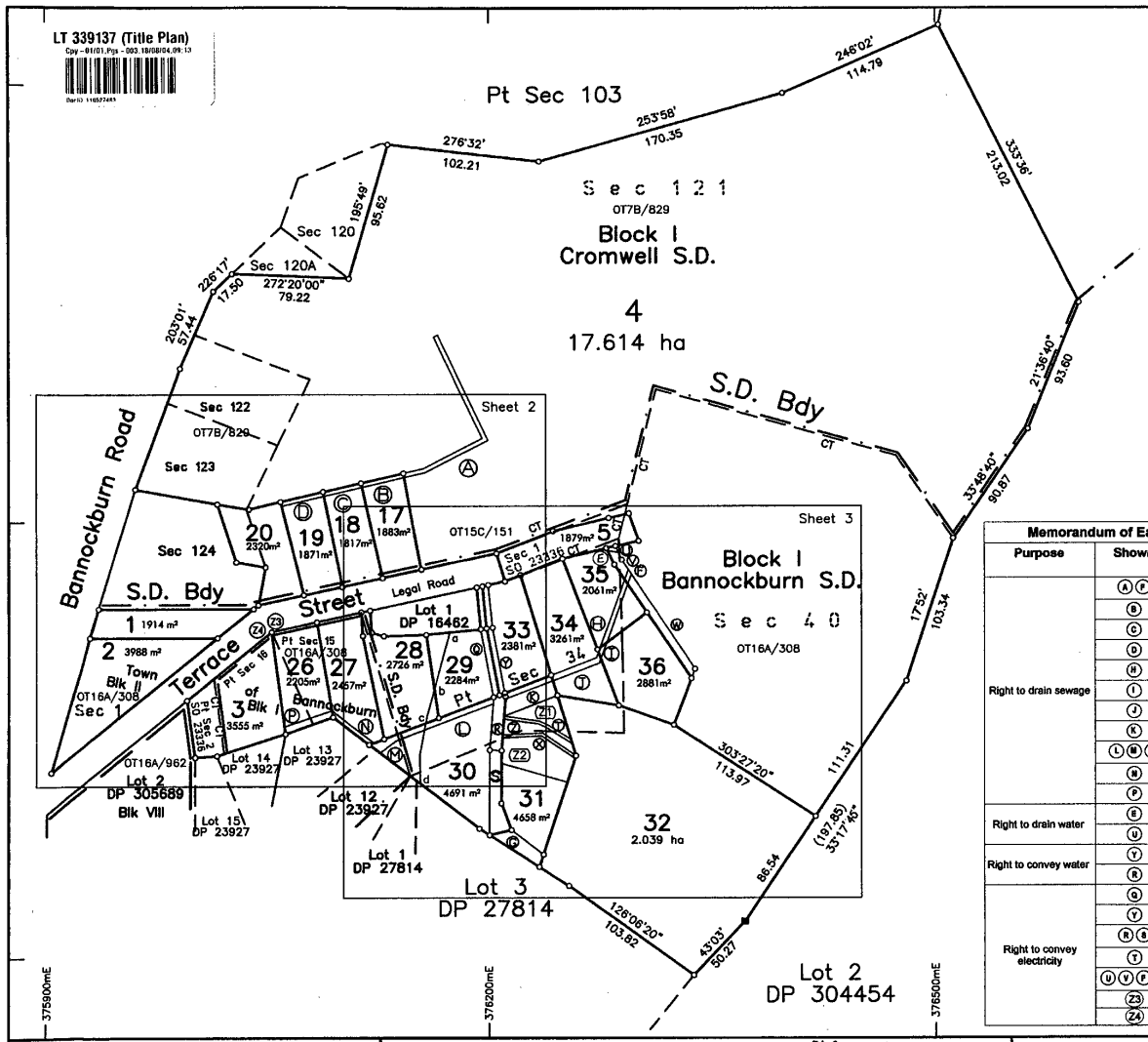
Subject to a right of way, right to convey water, telecommunications and computer media over part marked U, V, F, W DP 339137 created by Easement Instrument 6267274.8 - 24.12.2004 at 9:00 am

The easements (except computer media) created by Easement Instrument 6267274.8 are subject to Section 243 (a) Resource Management Act 1991

Subject to a right (in gross) to drain sewage over part marked B on DP 512361 in favour of Central Otago District Council created by Easement Instrument 10854120.1 - 10.4.2018 at 12:21 pm

Transaction ID 2284275
Client Reference
Search Copy Dated 22/12/23 1:39 pm, Page 2 of 4
Register Only

LT 339137 (Title Plan)



Memorandum of Easements in Gross

Purpose	Shown	Servient Tenement	Grantee
Right to drain sewage	A F	Lot 4 hereon	Central Otago District Council
	B	Lot 17 hereon	
	C	Lot 18 hereon	
	D	Lot 19 hereon	
	H	Lot 35 hereon	
	I	Lot 36 hereon	
	J	Lot 34 hereon	
	K	Lot 31 hereon	
	L M R	Lot 30 hereon	
	N	Lot 27 hereon	
	P	Lot 26 hereon	
Right to drain water	E	Lot 35 hereon	
	U	Lot 4 hereon	
Right to convey water	Y	Lot 33 hereon	
	R	Lot 30 hereon	
Right to convey electricity	Q	Lot 29 hereon	Aurora Energy Limited
	Y	Lot 33 hereon	
	R S	Lot 30 hereon	
	T	Lot 31 hereon	
	U V F W	Lot 4 hereon	
	Z3	Lot 26 hereon	
	Z4	Lot 3 hereon	

I hereby certify that this plan was approved by the Central Otago District Council pursuant to Sec 223 of the Resource Management Act 1991 on the 11th day of August 2004 subject to the granting or reserving of the easements shown in the Memoranda hereon and subject to the following amalgamation condition:

"That Lots 2,3 and 4 hereon be held in one certificate of title (see CSN Request 189811)"

L.A. van der Voort
(Pursuant to delegated authority) Chief Executive Officer

It is hereby certified that pursuant to Section 321(3)(b) of the Local Government Act 1974 the Central Otago District Council is satisfied that adequate access is provided to Lots 30,31,32 and 36 hereon by easement of right of way running with the land and appurtenant to those allotments and on that basis subsection 1 of Section 321 shall not apply.

Dated at Alexandra this 11th day of August 2004.

L.A. van der Voort
(Pursuant to delegated authority) Chief Executive Officer

New CT Allocated					
Lot 2	161034	Lot 20	161040	Lot 31	161046
Lot 3	161035	Lot 26	161041	Lot 32	161047
Lot 4	161036	Lot 27	161042	Lot 33	161048
Lot 17	161037	Lot 28	161043	Lot 34	161049
Lot 18	161038	Lot 29	161044	Lot 35	161050
Lot 19	161039	Lot 30	161045	Lot 36	161051

Schedule of Existing Easement

Purpose	Shown	Servient Tenement	Creating Document
Right to convey water	a-b	Lot 29 hereon	T.504828.1
	b-c	Lot 28 hereon	
	c-d	Lot 30 hereon	

NOTE:
1. See Sheet 3 for Memorandum of Easements.
2. Lots 1 and 5 to vest as road in Central Otago District Council.

Class of survey : III Lot 4
I all lots except Lot 4

Total Area 24.5362 ha

Comprised in OT16A/962, OT16A/308, OT15C/151, OT7B/829

I, Anthony John Cox

being a person entitled to practise as a licensed cadastral surveyor, certify that
(a) The surveys to which this dataset relates are accurate, and were undertaken by me or under my direction in accordance with the Cadastral Survey Act 2002 and the Surveyor-General's Rules for Cadastral Survey 2002/2
(b) This dataset is accurate, and has been created in accordance with that Act and those Rules.

Dated at CROMWELL this 30th day of JUNE 2004 Signature

Field Book . . Regs . . . . . Traverse Book . . . . . p . .
Reference Plans . . . . . .
Examined . . . . . Correct . . . . . .

Approved as to Survey by Land Information NZ on
12/10/04

Deposited by Land Information NZ on
24/12/04

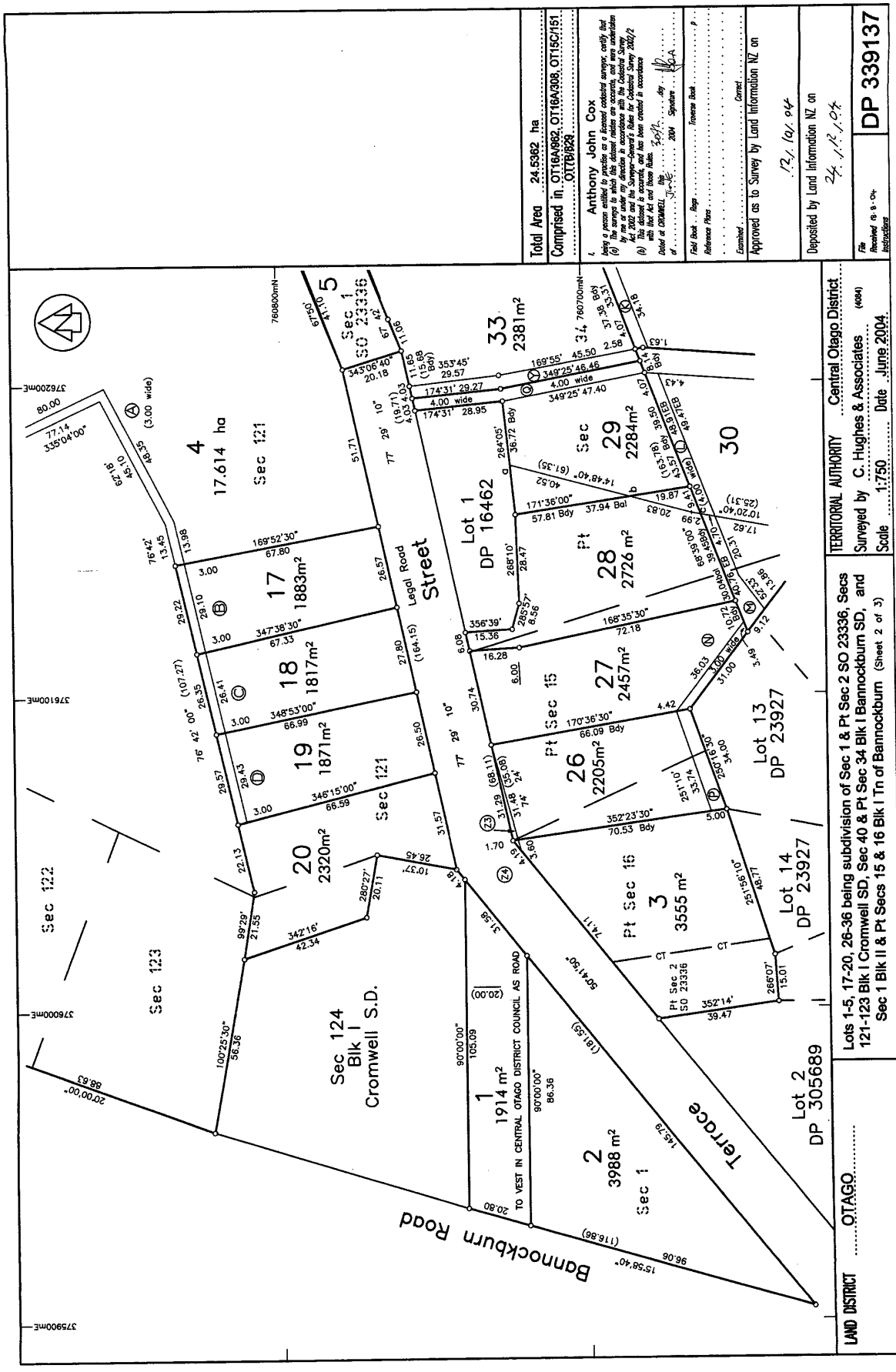
File 4084
Received 13-8-04
Instructions

DP 339137

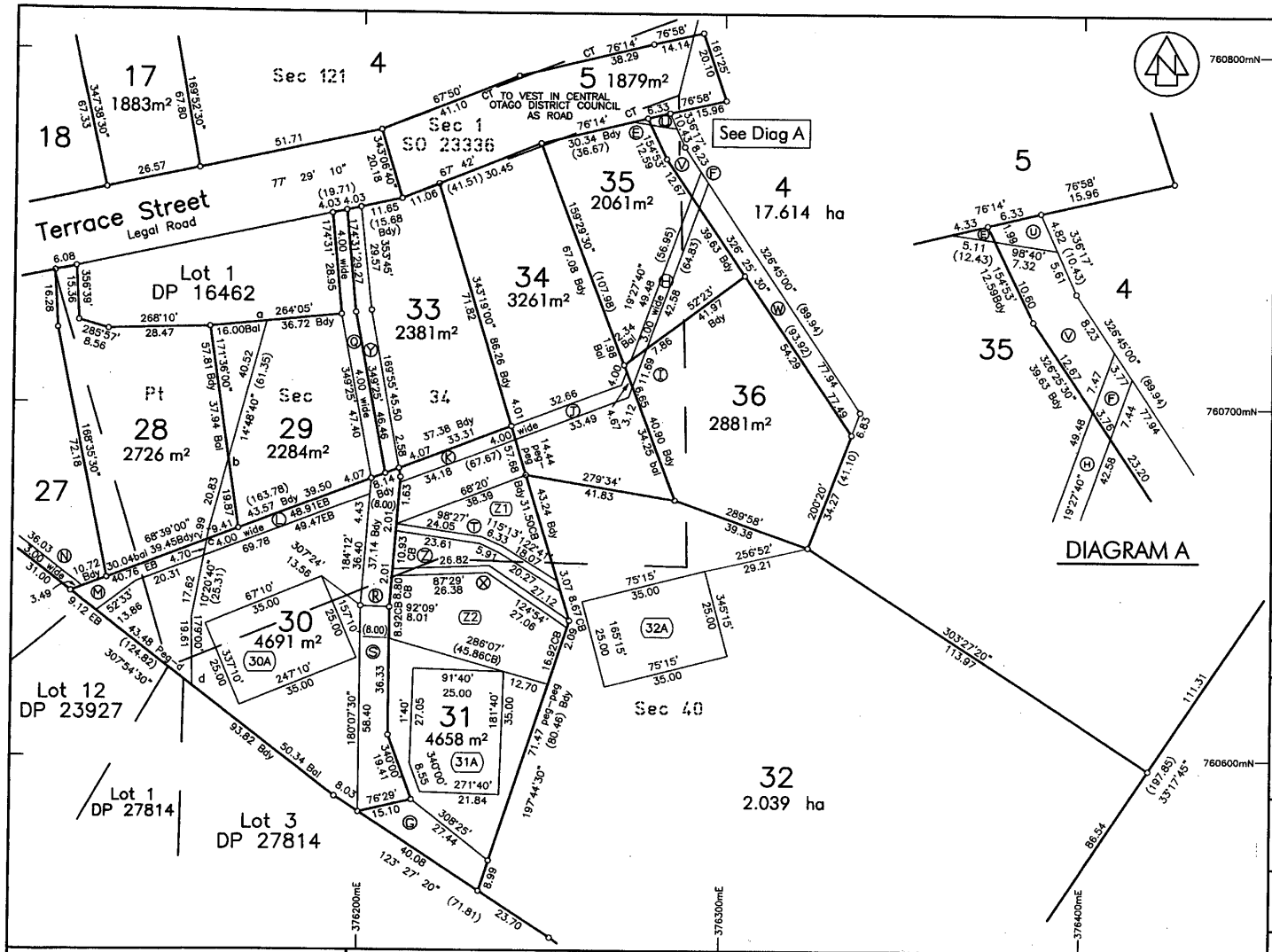
LAND DISTRICT OTAGO

Lots 1-5, 17-20, 26-36 being subdivision of Sec 1 & Pt Sec 2 SO 23336, Secs 121-123 Blk I Cromwell SD, Sec 40 & Pt Sec 34 Blk I Bannockburn SD, and Sec 1 Blk II & Pt Secs 15 & 16 Blk I Tn of Bannockburn (Sheet 1 of 3)

TERRITORIAL AUTHORITY Central Otago District
Surveyed by C. Hughes & Associates
Scale 1:2000 Date June 2004


DP 339137
Total Area 24.5362 ha
Comprised in OT16A/962, OT16A/308, OT15C/151, OT7B/529
I, Anthony John Cox
Approved as to Survey by Land Information NZ on 12/10/04
Deposited by Land Information NZ on 24/12/04
TERRITORIAL AUTHORITY Central Otago District
Surveyed by C. Hughes & Associates (4004)
Scale 1:750 Date June 2004
LAND DISTRICT OTAGO
Lots 1-5, 17-20, 26-36 being subdivision of Sec 1 & Pt Sec 2 SO 23336, Secs 121-123 Blk I Cromwell SD, Sec 40 & Pt Sec 34 Blk I Bannockburn SD, and Sec 1 Blk II & Pt Secs 15 & 16 Blk I Tn of Bannockburn (Sheet 2 of 3)
Bannockburn Road
Terrace
Legal Road
Street
Sec 122
Sec 123
Sec 124 Blk I Cromwell S.D.
Sec 121
Lot 1 DP 16462
Lot 13 DP 23927
Lot 14 DP 23927
Lot 2 DP 305689
Pt Sec 2 SO 23336
TO VEST IN CENTRAL OTAGO DISTRICT COUNCIL AS ROAD

Transaction ID 2284275
Client Reference
Search Copy Dated 22/12/23 1:39 pm, Page 4 of 4
Register Only



Memorandum of Easements			
Purpose	Shown	Servient Tenement	Dominant Tenement
Right of Way, Right to convey water, Right to transmit telecommunications	U V F W	Lot 4 hereon	Lot 36 hereon
Right of Way, Right to transmit telecommunications	Q	Lot 29 hereon	Lots 30-32 hereon
	Y	Lot 33 hereon	Lots 30-32 hereon
	R	Lot 30 hereon	Lots 31&32 hereon
	S	Lot 30 hereon	Lot 31 hereon
Right of Way	S	Lot 30 hereon	Lot 32 hereon
	G	Lot 31 hereon	Lot 32 hereon
Right to convey water, Right to transmit telecommunications	T	Lot 31 hereon	Lot 32 hereon
Right to drain sewage	X	Lot 31 hereon	Lot 32 hereon
Right to drain sewage and convey water	S	Lot 30 hereon	Lot 31 hereon

Memorandum of Easements in Gross			
Purpose	Shown	Servient Tenement	Grantee
Right to transmit telecommunications	U V F W	Lot 4 hereon	Telecom NZ Ltd
	Q	Lot 29 hereon	
	Y	Lot 33 hereon	
	R S	Lot 30 hereon	
	T	Lot 31 hereon	

NOTE:
1. Areas 30A, 31A, 32A are the building platforms referred to in the Consent Notice.
2. Areas T, X, Z, Z1, Z2 on Lot 31 are subject to a Land Covenant.

Total Area 24.5362 ha

Comprised in OT16A/962, OT16A/308, OT15C/151, OT7B/829

I, Anthony John Cox
being a person entitled to practice as a licensed cadastral surveyor, certify that
(a) The surveys to which this dataset relates are accurate, and were undertaken by me or under my direction in accordance with the Cadastral Survey Act 2002 and the Surveyor-General's Rules for Cadastral Survey 2002/2
(b) This dataset is accurate, and has been created in accordance with that Act and those Rules.
Dated at CROMWELL this 20th day of June 2004 Signature

Field Book ... Regs ... Traverse Book ... p ...
Reference Plans ...
Examined ... Correct ...

Approved as to Survey by Land Information NZ on
12/10/04

Deposited by Land Information NZ on
25/10/04

File
Received 18-8-04
Instructions

DP 339137

LAND DISTRICT OTAGO

Lots 1-5, 17-20, 26-36 being subdivision of Sec 1 & Pt Sec 2 SO 23336, Secs 121-123 Blk I Cromwell SD, Sec 40 & Pt Sec 34 Blk I Bannockburn SD, and Sec 1 Blk II & Pt Secs 15 & 16 Blk I Tn of Bannockburn (Sheet 3 of 3)

TERRITORIAL AUTHORITY Central Otago District
Surveyed by C. Hughes & Associates (4084)
Scale 1:750 Date June 2004

Rule/Regulation	Comment
National Environmental Standards	
National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (**NESCS**)	The NESCS will apply because mining has been undertaken on the land, and the proposed use of land involves a subdivision. A detailed site investigation has been commissioned. Regulation 8(3) restricts the volume of the disturbance of the soil of the piece of land to no more than a volume of 25m³ per 500m² area. Regulation 8(4) of the NESCS allows land-use change or subdivision of a piece of land as a permitted activity where it can be demonstrated it is highly unlikely that there will be a risk to human health given the intended activity. ENGEO consultants have undertaken both preliminary and detailed site investigation (refer **Attachment [D]**) and the contamination detected was below the thresholds under the NESCS for recreational, residential or commercial / industrial guideline criteria. The subdivision and development does not require any resource consents under the NESCS.
• National Environmental Standards for Plantation Forestry 2017 • National Environmental Standards for Air Quality 2004 • National Environmental Standard for Sources of Drinking Water 2007 • National Environmental Standards for Telecommunications Facilities 2016 • National Environmental Standards for Electricity Transmission Activities 2009 • National Environmental Standards for Freshwater 2020 • National Environmental Standard for Marine Aquaculture 2020 • National Environmental Standard for Storing Tyres Outdoors 2021	The activity does not engage other NES.
Otago Regional Plan: Water	

Rule/Regulation	Comment
Rule 14.5.1.1 *The use of land, and the associated discharge of sediment into water or onto or into land where it may enter water, for earthworks for residential development is a permitted activity providing:* *(a) The area of exposed earth is no more than 2,500 m2 in any 12-month period per landholding; and* *(b) Earthworks do not occur within 10 metres of a water body, a drain, a water race, or the coastal marine area; and* *(c) Exposed earth is stabilised upon completion of the earthworks to minimise erosion and avoid slope failure; and* *(d) Earthworks do not occur on contaminated or potentially contaminated land; and* *(e) Soil or debris from earthworks is not placed where it can enter a water body, a drain, a race or the coastal marine area; and* *(f) Earthworks do not result in flooding, erosion, land instability, subsidence or property damage at or beyond the boundary of the property where the earthworks occur; and* *(g) The discharge of sediment does not result in any of the following effects in receiving waters, after reasonable mixing:* *(i) the production of conspicuous oil or grease films, scums or foams, or floatable or suspended materials; or* *(ii) any conspicuous change in the colour or visual clarity; or*	The subdivision development associated with the construction of roads and services, would exceed 2,500m² and fail to comply with limb (a). A restricted discretionary activity resource consent is required under the RPW.

Rule/Regulation	Comment
(iii) any emission of objectionable odour; or *(iv) the rendering of fresh water unsuitable for consumption by farm animals; or* *(v) any significant adverse effects on aquatic life.* Activities that cannot comply with the above are a restricted discretionary activity pursuant to Rule 14.5.2.1. Discretion is restricted to the following matters: *(a) Any erosion, land instability, sedimentation or property damage resulting from the activities; and* *(b) Effectiveness of the proposed erosion and sediment control measures in reducing discharges of sediment to water or to land where it may enter water; and* *(c) Compliance with the Erosion and Sediment Control Guidelines for Land Disturbing Activities in the Auckland Region 2016 (Auckland Council Guideline Document GD2016/005); and* *(d) Any adverse effect on water quality, including cumulative effects, and consideration of trends in the quality of the receiving water body; and* *(e) Any adverse effect on any natural or human use value, and on use of the coastal marine area for contact recreation and seafood gathering; and* *(f) Measures to avoid, remedy or mitigate adverse effects on Kāi Tahu cultural and spiritual beliefs, values and uses.*	

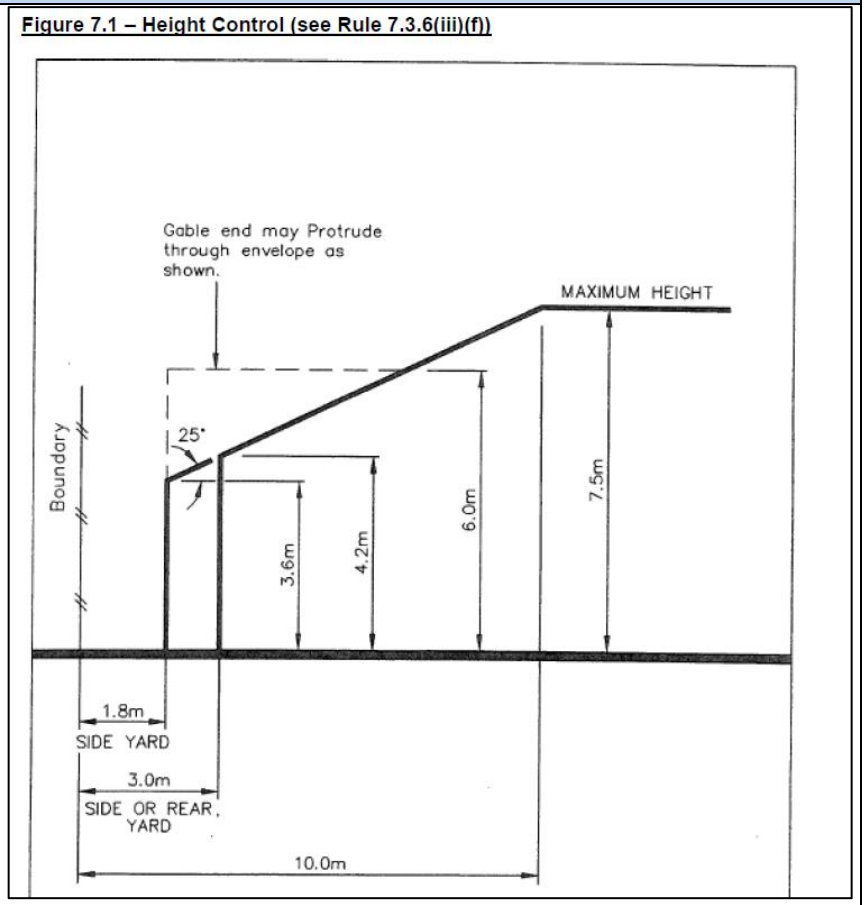
Rule/Regulation	Comment
Other Otago Regional Planning matters	On the basis the site is not near a waterbody, and the development will be connected to the Council's reticulated wastewater network and water supply, and stormwater can be appropriately managed no consents for wastewater or stormwater discharge, or water take are required under the RPW.
Central Otago District Plan	
Section 7 Residential Resource Area	
Rule 7.3.3 (i) *Subdivision shall be a discretionary (restricted) activity provided that:* *(a) Where a reticulated sewerage system is available or is installed as part of the subdivision the minimum size of allotments in the Residential Resource Area shall be 250m2.* *…* *Provided that* *(c) Notwithstanding (a) and (b) above, the following minimum size for allotments and other standards shall apply in the areas set out below:* *…* *Residential Resource Area (4)* *Minimum Allotment Area - 1500m2 provided that the average allotment size is no less than 2000m2.*	Rule assessment is covered in the AEE. A restricted discretionary activity consent is required.

Rule/Regulation	Comment
Note: For (a) to (c) above, minimum allotment areas for rear allotments are exclusive of access strips. *Council shall restrict the exercise of its discretion to the following:* *1. The provision of adequate network utility services (given the intended use of the subdivision) and in particular the location, design and construction of these services.* *2. The location, design and construction of access to public roads and its adequacy for the intended use of the subdivision.* *3. The provision of landscaping, including road berms.* *4. Earthworks necessary to prepare the site for development occupation, and/or use.* *5. Subdivisional design including the shape and arrangement of allotments to:* • *Facilitate convenient, safe, efficient and easy access.* • *Facilitate access to passive solar energy sources.* • *Facilitate the safe and efficient operation and the economic provision of roading and network utility services to secure an appropriate and co-ordinated ultimate pattern of development.* • *Maintain and enhance amenity values.* • *Facilitate adequate access to back land.* • *Protect existing water races.* *6. The provision of or contribution to the open space and recreational needs of the community.*	

Rule/Regulation	Comment
7. The provision of buffer zones adjacent to roads, network utilities or natural features. *8. The protection of important landscape features, including significant rock outcrops and escarpments.* *9. Provision for pedestrian movement, including the provision of walkways.* *10. The provision of esplanade strips or reserves and/or access strips.* *11. Any financial contributions necessary for the purposes set out in Section 15 of this Plan.* *12. Any amalgamations and easements that are appropriate.* *13. [Not relevant to this proposal]* *14. Any other matters provided for in section 220 of the Act.* *15. [Not relevant to this proposal]* *16. [Not relevant to this proposal]* *17. [Not relevant to this proposal]*	
Rule 7.3.4 (ii) *Subdivision of land subject to hazards (discretionary activity)* *Any subdivision that involves land that is subject to or potentially subject to the effects of any hazard as identified on the planning maps or land that is or is likely to be subject to material damage by erosion, falling debris, subsidence, slippage or inundation from any source is a discretionary activity.*	The site is not subject to any hazards are identified on the plan maps. The rule also refers to land that is or is likely to be subject to material damage by erosion, falling debris, subsidence, slippage or inundation from any source. The geotechnical report (Attachment [D]) identifies that the subdivision is feasible and the land is not considered to be subject to, or potentially subject to the effects of any hazard. The activity complies with this rule.

Rule/Regulation	Comment
Any application under this rule will generally not be notified but is to be accompanied by written comment obtained from a qualified professional that addresses the risk associated with the hazard within the proposed development and any remedial measures necessary to avoid, remedy or mitigate the hazard.	
Rule 7.3.5 (ii) (non-complying activity) *Buildings on Land Subject to Hazards* *The erection of any building (excluding buildings and/or structures associated with network utilities) on any part of a site identified on the planning maps as being subject to a hazard or land that is or is likely to be subject to material damage by erosion, falling debris, subsidence, slippage or inundation from any source is a non-complying activity.*	The activity complies with this rule. There are no hazards identified on the plan maps which affect the site.
Rule 7.3.5 (iv) (non-complying activity) *Subdivision – Residential Resource Areas (1) – (13)* *Subdivision of land in Residential Resource Areas (1) to (13) that is in breach of Rule 7.3.3(i)(c) is a non–complying activity.*	The proposal complies with this rule.
7.3.6 Standards (i) Traffic Generation and Characteristics of Activities; (ii) Sense of Amenity and Companionship; (iii) Bulk and Location of Buildings (a) yards adjacent to the margin of a lake; (b) Front Yards; (c) Side and Rear yards (d) Yards adjacent to Road Boundaries (e) Determination of Yards (f) height (refer below)	The standards in relation to activities have been reviewed and the proposal either; does not engage with the rule; and/or future residential activity on lots 1-20 can readily comply through no issue with the design of the subdivision, the exception is the extraction rule (7.3.6 (x)) associated with the subdivision development works.

Rule/Regulation	Comment
(iv) Maximum Coverage (refer below) (v) Carparking (vi) Access (vii) Signs (vii) Keeping of Animals (ix) Tree planting in RR(8) (x) Extraction (refer below) (xi) Relocatable Dwellings (xii) Acoustics – not relevant to RR(4) (xii) Landscaping – not relevant to RR(4)	
Height *Rule 7.3.6 (iii) (f) Height* *(1) <u>Normal Standard</u>* *Except on land identified in (2), (3) and (5) below and as set out in (c) above for accessory buildings, the maximum height of all buildings shall be as follows:* *(i) Along the line of the 1.8 metre side yard, no part of any building shall exceed 3.6 metres and along the line of the 3.0 metre side or rear yard, no part of any building shall exceed 4.2 metres, as measured from the natural ground level prior to any excavation or filling of the site, averaged between the extremities of the building foundations adjacent to the yard under consideration, provided that the apex of a single gable end of a building may have a maximum height of 6 metres.* *(ii) Beyond the line of the minimum side and rear yard, no part of any building shall exceed the height determined by an inclined plane and originating from the height determined in (i) above and inclined upwards at an angle of 25o to the horizontal provided that the apex of a single gable end may protrude through any plane to a height not greater than that permitted in (i) above and provided further that the maximum height of any building that is contained within the recession plane shall not exceed 7.5 metres.* *<u>Note:</u> Application of this rule is illustrated in Figures 7.1 – 7.3 presented on pages 7:32 and 7:33*	Future buildings on each lot are able to comply with this rule. Noting that outside the boundary setbacks, the maximum permitted building height is 7.5m, or 7m on sites 6° or greater.

Rule/Regulation	Comment
(iii) The maximum height in the Residential Resource Area (8) shall be 5 metres. [Not relevant] *(2) <u>Sloping Sites</u>* *On sloping sites that exceed 6 degrees (ie greater than 1 in 9.5) and those areas identified as R* on the planning maps the maximum height of all buildings shall be as follows –* *(i) 5 metres - within 4.5 metres of a front, side or rear boundary.* *(ii) 7 metres - beyond 4.5 metres of a front, side or rear boundary.* *where the maximum height shall be the actual height of a building vertically above any given point and measured from the natural ground level.* *(3) <u>Residential Resource Area (10) [Not relevant]</u>* *(4) <u>Residential Resource Area (13) [Not relevant]</u>* *(5) <u>Residential Resource Area in the Wooing Tree Overlay Area</u> [Not relevant]* *<u>Reason</u>* *Separation and height controls maintain and enhance amenity values of the residential area. They also assist in reducing the impact on neighbouring properties access to sunlight and privacy.* *The variance in yard standards reflects the differing amenity standards found within the Districts residential areas.*	**<u>Figure 7.1 – Height Control (see Rule 7.3.6(iii)(f))</u>** 
Rule 7.3.6 Standards *(iv) Maximum Coverage* *The maximum site coverage by the principal building and accessory buildings (including garages and carports) shall be 40%; except within the Residential Resource Area in the Wooing Tree Overlay Area where the maximum site coverage shall be 80%.*	Future buildings within each would be able to readily comply with this rule.

Rule/Regulation	Comment
Rule 7.3.6 Standards *(x) Excavation* *Any extraction of material shall not exceed 1 metre in depth within 2 metres of any site boundary.*	The activity complies with this rule.
Section 12 District Wide	
Rule 12.7.1 Access Standards From Roads Access to and from roads is a permitted activity provided it is in accordance with the following standards: (i) Construction and Maintenance (ii) Sight Distances (iii) – (vii) relate to access to roads based on the hierarchy of the road and do not engage with the subdivision. The connection to Terrace Street will be via a the formation of an access that will be vested as road.	The subdivision design complies with these standards, and future lot owners should be able to comply with these rules.
Rule 12.7.2 Parking Rule 12.7.3 Loading and Manoeuvring Rule 12.7.4 Noise Rule 12.7.5 Signs Rule 12.7.6 Lightspill Rule 12.7.7 – Building Line Restriction (see below) Rule 12.7.8 Transmission Lines	These rules are not directly engaged by the subdivision development activity, and the design of the subdivision does not preclude any future landowner complying with these rules, subject to the design of future residential development. The activity complies with these rules.
Rule 12.7.7 Building Line Restrictions *(i) No building shall be erected within any building line restriction shown on the planning maps between the building line and the feature to which it relates.* *(ii) Breach of Standard* *Any activity which does not comply with this rule shall be a discretionary (restricted) activity.* *Council shall restrict the exercise of its discretion to the following matters:* *1. The effect on the natural character of water bodies and their margins.*	Lots 4, 5, 6, 13, 14, 15 to 20 are located either entirely within, or such that future buildings will be more likely than not located within the BLR. A restricted discretionary activity resource consent is required.

Rule/Regulation	Comment
2. The effect on amenity values of the neighbourhood in particular the character of the streetscape. *3. The effect on the safe and efficient operation of the roading network.* *4. The effect on infrastructure.* *5. The effect on the safety of neighbours.* *6. The effects of noise from the operation of the roading network and compliance with AS/NZS 2107:2000.* *<u>Reason</u>* *Building line restrictions are a useful technique to protect amenity values and the safe and efficient operation of certain roads. They are also useful to avoid the effects of natural hazards on the built environment. The area subject to restriction is shown as 'BLR' on the planning maps.*	
Section 14 Heritage Buildings, Places Sites and Trees	
Rule 14.7.1 Heritage Buildings, Places and Objects (a) Registered items with NZ Historic Places Trust Category 1 Classification (i) The removal or demolition of a building or structure identified in Part A of Schedule 19.4 as an item having a NZ Historic Places Trust classification of Category I is a non-complying activity. (ii) Any alteration or addition (including any sign) to a building or structure identified in Part A of Schedule 19.4 as an item having a NZ Historic Places Trust classification of Category I is a discretionary activity.	The site does not contain any features as identified on the plan maps. The activity complies with this rule.
(b) Registered Items with a NZ Historic Places Trust Category II Classification and Other Items Listed *(i) Any exterior alteration or addition (including any sign) to a building or structure identified in Part A of Schedule 19.4 as an item that has a NZ Historic Places Trust classification of Category II or is otherwise listed in Part A of Schedule 19.4 is a discretionary (restricted) activity.*	The site does not contain any features as identified on the plan maps. The activity complies with this rule.

Rule/Regulation	Comment
Council shall restrict the exercise of its discretion to the effects the exterior alteration or addition will have on the heritage values of the item. *(ii) The removal or demolition of a building or structure identified in Part A of Schedule 19.4 as an item that has a NZ Historic Places Trust classification of Category II or is otherwise listed in Part A of Schedule 19.4 is a discretionary activity.* *Reason* *Items with a NZ Historic Places Trust classification of Category I are places of special or outstanding historical or cultural heritage significance or value. This is the highest classification in terms of the NZ Historic Places Trust. This has been recognised by identifying the removal or demolition of such items as a non-complying activity. Removal or demolition of heritage items that are not Category I and the alteration and addition to the Category I items has been identified as a discretionary activity as there may well be valid reasons why a heritage item needs to be demolished (for example, public safety) or altered (for example, to enable sympathetic use of a building).* *Note: All items in Schedule 19.4 are identified on the planning maps.*	
14.7.2 Notable Trees *(i) The removal of any tree identified in the register in Part B of Schedule 19.4 except where that tree has died of natural causes is a discretionary activity.* *(ii) The following works that involve a tree or a group of trees listed in the register in Part B of Schedule 19.4 shall be a discretionary (restricted) activity:* *(a) Significant trimming of the tree*	The site does not contain any Notable Trees. The activity complies with this rule.
14.7.3 Historic Reserves	The site is not a Historic reserve or identified in Schedule 19.10. The activity complies with this rule.

Rule/Regulation	Comment
Any work or activity (including the renovation or restoration of historic buildings or structures) undertaken by persons or bodies (including the Crown) on or within the land identified in Schedule 19.10 as an historic reserve or protected private land for historic purposes or land held or managed under the Conservation Act 1987 and those other Acts specified in the First Schedule of that Act for historic purposes, is a permitted activity provided that, *1. Such works are consistent with the particular Act under which the land is held, or any management strategy or plan developed under that Act.* *2. Such works are consistent with the general rules of this plan and the rules of the Resource Area that applies to the site.* *3. Notice is given to Council at least 20 working days prior to the carrying out of any such work or activity that outlines the intention and nature of the work or activity and how it complies with the matters referred to in this rule, at least 20 working days prior to the commencement of the work or activity.* *Any activity that does not comply with this rule and the erection of any building on an historic reserve or protected private land for historic purposes shall be considered as a discretionary activity.* *<u>Reason</u>* *The rules relating to resource use within these lands are generally set out by the relevant Act. Therefore Council need only intervene when the objectives of the Act are not being achieved or there is a significant effect generated outside the boundary of the land concerned.*	
Rule 14.7.4 Archaeological Sites And Waahi Tapu (Sacred Sites) (i) Archaeological Sites Where any activity disturbs or identifies the presence of an archaeological site, all work shall cease, and the following process shall be followed: (a) Where the site is registered or the find or site includes koiwi tangata (unidentified human remains) Rule 14.7.4 (ii) and/or (iii) shall apply.	Rule (i): The site contains archaeological sites associated with former mining and early European settlement. The archaeological sites present on the application site are not registered in the District Plan, Therefore rule (b) applies and the HPA 1993 applies, and therefore its replacement legislation the Heritage New Zealand Pouhere Taonga Act 2014 (**HNZPTA**).

Rule/Regulation	Comment
(b) Where the site is not registered or koiwi tangata do not occur, the provisions of sections 9 to 21 of the Historic Places Act 1993 shall apply. (ii) Registered Sites (refer Part A - Schedule 19.4) Any activity that is likely to modify or disturb or affect any archaeological site or waahi tapu site listed in Part A of Schedule 19.4 shall be considered as a non-complying activity. Note: the provisions of sections 9 to 21 of the Historic Places Act 1993, will also apply to these activities. (iii) Koiwi Tangata (unidentified human skeletal remains)	The HNZPTA makes it unlawful to destroy or modify the whole or part of an archaeological site without the prior authority of Heritage New Zealand. This is a separate statutory process to obtaining any resource consents required under the District Plan. These processes are addressed in the Kopuwai Consulting report appended to the notified application. Rule (ii) The site does not contain any registered sites in Schedule 19.4 of the District Plan. Rule (iii) There is no evidence suggesting the site contains Koiwi Tangata. A condition of consent or advice note can alert the consent holder to obligations in the event of an accidental discovery. The activity complies with this rule.
Subdivision	
General comment: the rules for subdivision in Section 16 of the ODP require adherence to generic standards including compliance or implementing the relevant Code of Practice. The proposal can comply with these provisions, or modifications via conditions of consent. The following rules are identified as potentially relevant to the proposal.	
16.7.4 Minimum Access Widths - Urban Areas *Minimum access widths for rear allotments in urban areas shall be as follows:* • *1 Lot = 3.6 metres legal, 3.0 metres formed and sealed, and no more than 60 metres in length* • *2 - 4 Lots = 6 metres legal, 4 metres formed and sealed, and no more than 60 metres in length.* • *5 or more Lots = To a road standard as determined by conditions of resource consent.*	The activity is able to comply with these provisions, or modification as subject to consent.

Rule/Regulation	Comment
<u>Provided that</u> Council may require a different standard as a condition of the resource consent given the particular characteristics of the locality and/or subdivision and provided that where an access more than 60 metres is proposed, provision may be required for the passing of vehicles on the access. *<u>Note</u>: Private access to rear allotments may be achieved by access lots or access strips with reciprocal rights of way.*	
16.7.6 Maximum Gradients for Carriageways The maximum gradients for carriageways shall be as follows – Private access - 1 in 5. Roads - 1 in 8.	The activity will comply with this rule, refer to the Bartlett consulting traffic assessment.