Queenstown Lakes District Council

Proposed District Plan - Submission Form

Clause 6 of First Schedule, Resource Management Act 1991
FORM 5

Correspondence to:
Attn: Submission Team
Queenstown Lakes District Council
Private Bag 50072
QUEENSTOWN 9348

For office use only **Submission No:**
Receipt Date:

1. Submitter details:

Full Name of Submitter:	**Trojan Helmet Limited (THL)**
Address for Service:	**C/- Brown & Company Planning Group, PO Box 1467, QUEENSTOWN**
And:	**C/- Lane Neave, P O Box 701, QUEENSTOWN 9348**
Email:	**office@brownandcompany.co.nz** **Rebecca.wolt@laneneave.co.nz**
Contact Person:	**A Hutton / J Brown** **R Wolt**

2. Scope of submission

This is a submission on the Queenstown Lakes District Proposed District Plan ("PDP"), notified 26 August 2015

The specific provisions that the submission relates to are:

The entire PDP, including but not limited to:

2.1 Chapter 22: Rural Residential & Rural Lifestyle Zone (submit for land to be added)

2.2 Chapter 27: Submit additional site specific objectives, policies, subdivision rules and Structure Plan

2.3 Chapter 6: Landscapes

2.4 Planning maps

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3. Submission

3.1 General

The Proposed District Plan (**PDP**) must, in achieving the purpose of the Act, strike an appropriate balance between all relevant resource management issues relating to the use, development and protection of the Districtôs natural and physical resources. The rapid population growth of the District will continue for the foreseeable future ï being well beyond the life of this District Plan ï and the PDP has a fundamental role in accommodating this growth, while protecting the values that contribute to how people and communities appreciate the District. This appreciation is the very reason for the rapid growth.

Growth must be accommodated in many sectors: residential, visitor accommodation, retail, business, industrial, tourism, and commercial recreation, and all related sectors and services such as education, community, and transport. All of these uses require physical space. For some uses there is likely to be sufficient spatial capacity (over the life of the District Plan) but for other uses, such as residential, there are current pressing needs for new space.

In the residential sector, the growth is in all of the residential demand categories and across a range of affordabilities, including in high and low density urban and suburban areas, and rural residential and rural lifestyle areas. All of these categories of demand will continue to grow, and the PDP must recognise and provide for this, within the parameters of the purpose and principles of the Act.

Growth impacts on other resource management issues facing the District, including managing the Districtôs landscape values. It is inevitable that growth will affect landscape values. This inevitability should be accepted, and the PDP should focus on how the effects can be appropriately managed so that adverse effects are avoided, remedied or mitigated and future generations can continue to enjoy the values that attract growth.

THL considers that the PDP as notified does not strike an appropriate balance between accepting the inevitability of growth and how landscape values should be managed in the face of this growth. Rather, the PDP is weighted too far in the direction of protection of all landscapes, and this will frustrate appropriate development proposals.

Further, the notified PDP over-emphasises the importance of farming activities. Farming is one method for utilising rural resources, but its long term economic opportunities, in many rural parts of the District, are very uncertain. The value of rates in many cases means that the farming incomes need to be high to meet those costs as well as to provide an income for the farmer. There are very few farmers that derive their income entirely from farming, particularly within the Wakatipu Basin.

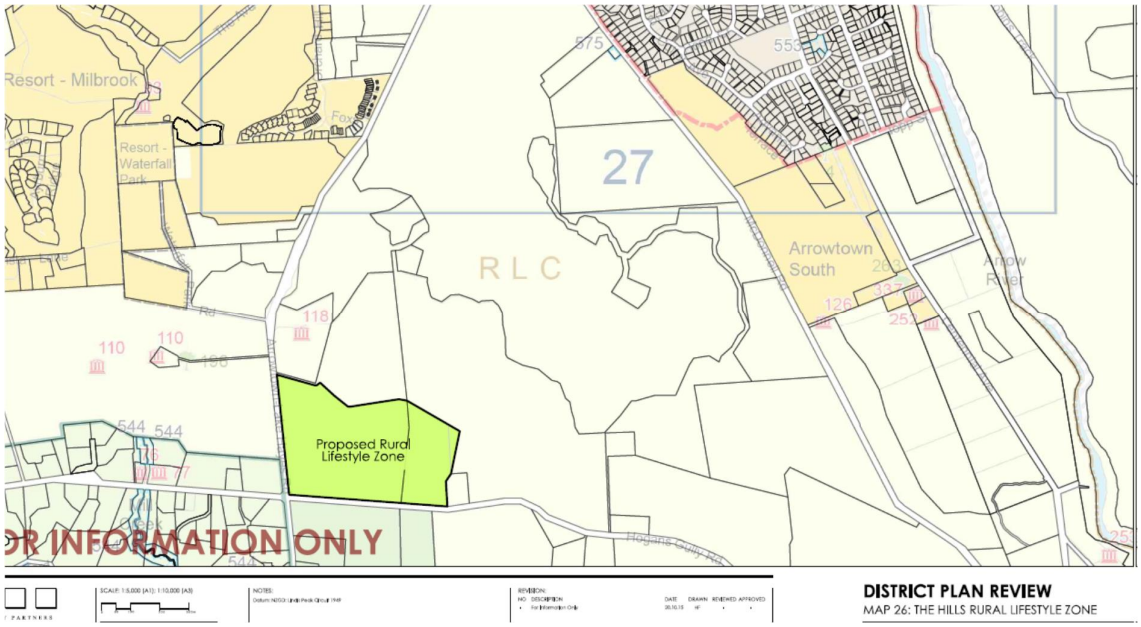
Other activities that require a rural location, such as rural residential and rural lifestyle uses, may better provide economic wellbeing for landowners and the wider community in the face of rapid growth, and therefore should also be enabled and should be on at least an equal footing with farming, depending on location and managing potential adverse effects on landscape and other values.

A District Plan regime that balances protection and use and development of all resources, taking into account particularly Sections 6(b) (the protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development); 7(c) (the maintenance and enhancement of amenity values) and 7(f) (the maintenance and enhancement of the quality of the environment) is the most appropriate regime to achieve the purpose of the Act.

Accordingly, THL considers that PDP Chapters 22 (Rural residential and Rural Lifestyle), and Chapter 27 (Subdivision and Development), Map 22 should be modified to include the land located along Hogans Gully Road. These modifications are set out in Sections 3.2 ï 3.4 below.

3.2 Rezoning

3.2.1 THL seeks that the land identified on the plan below be rezoned Rural Lifestyle:



3.2.2 The submission to rezone the land identified above is supported by the following reports, which are **attached** to and form part of this submission:

- The site to be rezoned Rural Lifestyle as **Annexure A**
- The Proposed Structure Plan for the Rural Lifestyle Zone (Hogans Gully Road Resort Zone as **Annexure B**
- A Section 32 evaluation of the proposed rezoning, Prepared by Brown & Company Groupas **Annexure C**
- The Rural Lifestyle Zone (Hogans Gully Road), Master Planning report, prepared by Darby Partners, Dated 21 October 2015 as **Annexure D**
- The Rural Lifestyle Zone (Hogans Gully Road), Assessment of Landscape and Visual effects, Prepared by Boffa Miskell, Dated October 2015 as **Annexure E**
- The Rural Lifestyle Zone (Hogans Gully Road), Transportation Assessment Report, Prepared by Traffic Design Group, dated October 2015 as **Annexure F**
- The Hills Golf Course Land, Infrastructure Feasibility. Prepared by Hadley Consultants Limited, dated 21 October 2015 as **Annexure G**
- Hills Golf Course Land (including McDonnell Road Gully Land) and Hogans Gully Land, Natural Hazard Assessment, Prepared by Hadley Consultants Limited, dated 21 October as **Annexure H**

- Preliminary and Detailed Site Investigation, Prepared by Davis Consulting Limited, Dated October 2015 as **Annexure I**

These reports undertake a detailed and comprehensive assessment of the proposed rezoning and reach the conclusion that it is appropriate. The conclusion reached in each of the reports is, in summary:

Landscape: The Site is relatively visually contained, and due to the existing togography, and the existing and proposed vegetation and setbacks from roads, including the proposed Landscape Amenity Management Area, the proposed rezoning will not give rise to significantly adverse landscape or visual effects, and is appropriate for and will maintain the character of the surrounding area.

Traffic: the surrounding roading network can accommodate the increase in traffic that will arise as a result of the rezoning, and accessways to the new zone can be safely and appropriately designed and located.

Natural Hazards: The proposed zone is not subject to any natural hazard risk.

Servicing and Infrastructure: The development enabled by the rezoning can be appropriately serviced, and infrastructure is or can be made available and appropriately designed in terms of water supply, wastewater and stormwater.

Soil Contamination: the site does not present any risk to human health and is suitable for development for residential activity. If remediation of any part of the site is required, it can be appropriately addressed at the time of resource consent.

Planning Assessment: The proposed rezoning is consistent with the relevant objectives and policies in the Proposed Plan and achieves the Purpose of the Resource Management Act. The proposal is appropriate in terms of section 32 of the Act.

3.2.3 As part of the proposed rezoning, and to give effect to the proposed structure plan for the new zone, several amendments to Chapter 22 and Chapter 27 of the PDP are required, as detailed in the below submission points.

3.3 Chapter 22 (Rural Residential & Rural Lifestyle)

3.3.1 THL supports Table 2, Building materials and Colours, subject to the following modifications (or similar):

Table 2, Building Materials and Colours

All buildings, including any structure larger than 5m^2, new, relocated, altered, reclad or repainted, are subject to the following in order to ensure they are visually recessive with the surrounding landscape:

22.5.1.1 *All exterior surfaces **(excluding windows)** shall be coloured in a range of black, browns, greens and greys;*

22.5.1.2 *Pre-painted steel, and all roofs shall have a reflectance value not greater than 20%*

22.5.1.3 *Surface finishes hall have a reflectance values of not greater than 30%.*

22.5.1.4 ***Natural materials such as locally sourced schist and unstained cedar may be used.***

Discretion is restricted to all of the following:

- *Whether the building would be visually prominent, especially in the context of the wider landscape, rural environment and as viewed from neighbouring properties*
- *Whether the proposed colour is appropriate given the existence of established screening or in the case of alternations, if the proposed colour is already present on a long established building.*
- *The size and height of the building where the subject colours would be applied.*

The reasons for the support and proposed modifications include:

(i) It is efficient to list the acceptable building materials and colours that are acceptable in the Rural Residential and Rural Lifestyle Zones. This enables a reduction in the volume of consents required in the zone and ensures that development is of an appropriate standard to be sensitive to the surrounding environment. If an applicant wishes to pursue not listed colours or materials then there is a clear list of matters of discretion for any consent to be tested against.

(ii) Without the modifications sought by THL, Rule 22.5.1.1 requires all exterior surfaces to be in the range of black, browns, greens and greys, which may capture other parts of an exterior surface including windows, which is not appropriate and unlikely to be the intention of the proposed rule.

(iii) There are a number of building materials that occur naturally in the local environment which may not have a reflectance value of not greater than 30%, or, because of their natural state, the reflectance values of these materials may be not able to be quantified. It appropriate that these locally occurring natural products are provided for by the rule as appropriate building materials in the Rural Lifestyle zone.

3.3.2 ***22.5.3 Building Size***

THL opposes Rule 22.5.3 which limits the maximum size of any building in the Rural Lifestyle zone to 500m^2 and considers it should be deleted. THL considers there is no resource management reason to limit the size of a dwelling. Issues of dominance, character and amenity should be assessed as appropriate at time of zoning of land. The rule is therefore unnecessary.

3.3.3 ***22.5.5 Setback from Roads***

THL seeks that Rule 22.5.5 be modified to include appropriate setbacks for buildings from roads in the proposed Rural Lifestyle zone sought by this submission. The modifications will ensure the rezoning does not give rise to adverse landscape or visual effects. The particular modifications sought are as follows (or similar):

22.5.5 Setback from Roads

The minimum setback of any building from a road boundary shall be 10m, except:
- *in the Rural Residential zone at the north end of Lake Hayes, the minimum setback from Speargrass Flat road shall be 15m.*
- ***In the Rural Lifestyle zone on Hogans Gully Road the minimum setback shall be 75m.***

The reasons for the proposed modifications include:

(i) The structure plan proposed for the new zone (to be included in Chapter 27.7) provides for a Landscape Amenity Management Area in which

landscaping will be undertaken and buildings are not permitted. The modification sought to the rule provides for this. The modification also ensures that the rezoning is appropriate for and in character with the surrounding area.

3.4 Chapter 27 (Subdivision and Development)

3.4.1 THL seeks the following additional objectives and policies (or similar), be included in Chapter 27, to apply to the land identified in Annexure A if its submission for a Rural Lifestyle zoning for that land is accepted:

27.7.21 Hogans Gully Rural Lifestyle Zoning

Objective 27.7.21.1:
Enable subdivision to Rural Lifestyle densities while maintaining the landscape character of the surrounding area.

Policy 27.7.22.1.1
Subdivision shall be undertaken in accordance with a Structure Plan which provides for appropriate setbacks and landscaping to maintain the landcape character of the surrounding area.

Policy 27.7.22.1.2
Require the provision of a Landscape Amenity Management Area to preserve views of the surrounding landscape from public roads while visually softening the appearance of buildings in the zone

Policy 27.7.22.1.3
Avoid linear planting and buildings in the Landscape Amenity Management Area

The reasons for the new objective and policies include:

(i) As noted in the landscape assessment by Boffa Miskell it is important to retain the character of the surrounding area and the openness currently associated with the site. The requirement for subdivision to be undertaken in accordance with a structure plan which shows a Landscape Amenity Management Area within which linear plantings and buildings are to be avoided is an appropriate way to achieve this.

3.4.2 THL seeks the following additional rules (or similar), be included in Chapter 27, to give effect to the objective and policies proposed above:

27.8.10 Hogans Gully Rural Lifestyle Zoning

27.8.10.1 Hogans Gully Structure Plan – Subdivision failing comply with this rule shall be a discretionary activity.

(a) In the Hogans Gully Rural Lifestyle Zone, subdivision shall be in general accordance with the Structure Plan located within Part 27.13 of this Chapter. All subdivision shall result in the following:
(i) Location of all building platforms within the zone
(ii) Location of internal lot boundaries
(iii) Access to the zone to be provided from Hogans Gully Road
(iv) Provision of a Landscape Management Plan which details landscape treatment and management within the Landscape Amenity Management Area, and includes the following:

- ***A planting layout plan for the Landscape Amenity Management Area, which includes species and densities of tussocks and naturalised groups of exotic and***

indigenous trees and shrubs and mowed grass. The purpose of the planting layout shown in the plan is to create a predominately open character;

- ***Timeframes and sequencing of works;***
- ***Details of the proposed maintenance programme to ensure a survival rate of at least 90% within the first 5 years.***

(b) Registration of a consent notice which requires the Landscape Amenity Management Area to be established and maintained by the subdividing owner and/or subsequent owners of any individual allotment on a continuing basis.

The reasons for the additional rules sought include:

(i) They provide certainty that the intent of the objectives and policies will be carried out.

(ii) They ensure the landscape character of the surrounding area openness of the site are maintained via a Landscape Management Area and the provision of a landscape management plan.

(iii) Accesses can be formed to service the proposed Rural Lifestyle Zone.

(iv) They ensure the outcomes sought by the structure plan will given effect to.

3.5 Chapter 6 – Landscapes

3.5.1 THL Opposes Rule 6.4.1.2 and seeks that it is amended as follows:

6.4.1.2 The landscape categories and the provisions of this chapter apply only to the Rural Zone. The ~~Landscape Chapter and~~ Strategic Direction Chapter's objectives and policies are relevant and applicable in all zones where landscape values are at issue.

The reasons for the proposed modifications include:

(i) The proposed rule introduces a level of uncertainty to the Proposed Plan that is not required. The Rural Residential and Rural Lifestyle Zone has its own set of objectives and policies that address landscape issues. Any additional site specific issues are addressed through site specific objectives and policies for the particular zone.

(ii) The additional layer of objectives and policies is inefficient. It is unnecessary and inappropriate for the Council to require assessment under another Chapter which also addresses landscape issues.

(iii) The Rural Residential and Rural Lifestyle Zone already contain appropriate objectives and policies to address landscape issues and promote sustainable management within the Zone.

(iv) Consequential amendments to the objectives and policies in Chapter 6 may be required to clarify they do not apply to the Rural Lifestyle zone.

3.6. THL considers that without the amendments detailed in this submission the Proposed Plan:

(a) Is not the most appropriate way to promote the sustainable management of natural and physical resources;

(b) Is not the most appropriate way to provide for the efficient use and development of natural and physical resources;

(c) Is otherwise inconsistent with the relevant provisions of the Resource Management Act 1991, including the purposes and principles of Part 2 of the Act; and

(d) Does not result in the most appropriate plan provisions in terms of section 32 of the Act.

4. Trojan Helmet Limited seeks the following decision from the Queenstown Lakes District Council:

4.1 That the land identified in Annexure A be rezoned Rural Lifestyle zone and the modifications to Chapters 6, 22 and 27 outlined in section 3.of this submission be allowed; or

4.2 That the Proposed Plan be amended in a similar or such other way as may be appropriate to address the matters raised in this submission; and

4.3 Any consequential decisions required to address the matters raised in this submission.

Trojan Helmet Limited **DOES** wish to be heard in support of this submission.

If others make a similar submission, Trojan Helmet Limited will consider presenting a joint case with them at a hearing.

Signature of Submitter

A A Hutton
Authorised to sign on behalf of Trojan Helmet Limited

Date: 23 October 2015

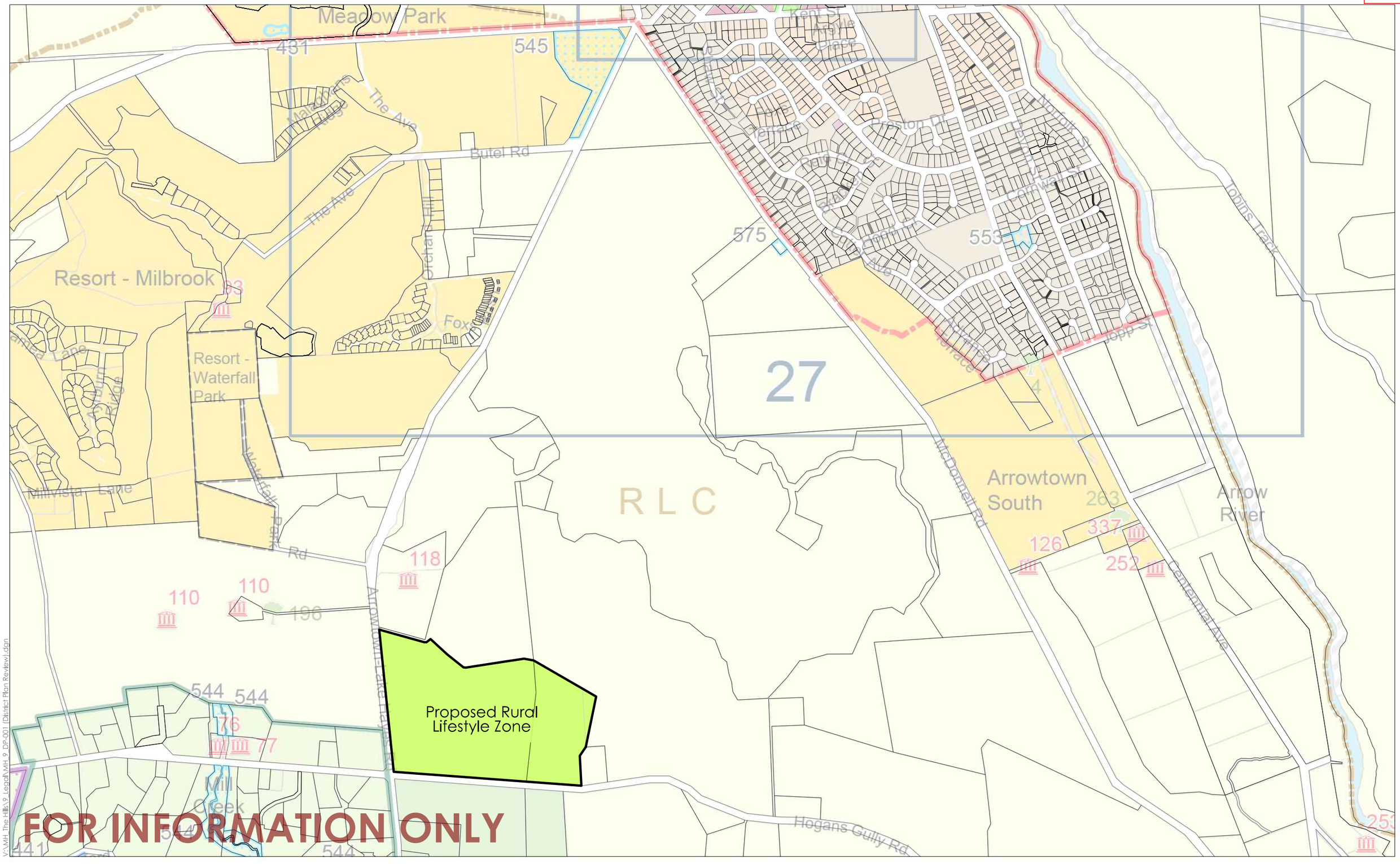
Telephone: 03 409 2258 / 021 529 745

Notes to person making submission:

If you make your submission by electronic means, the email address from which you send the submission will be treated as an address for service.

If you are a person who could gain an advantage in trade competition through the submission, your right to make a submission may be limited by clause 6 (4) of Schedule 1 of the Resource Management Act 1991.

The submitter could NOT gain an advantage in trade competition through this submission



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SCALE: 1:5,000 (A1); 1:10,000 (A3)

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CONSULTANTS:

NOTES:
Datum: NZGD: Lindis Peak Circuit 1949

REVISION:

NO	DESCRIPTION	DATE	DRAWN	REVIEWED	APPROVED
-	For Information Only	20.10.15	HF	-	-

DISTRICT PLAN REVIEW

MAP 26: THE HILLS RURAL LIFESTYLE ZONE

PLAN STATUS:	JOB CODE:	DRAWING NO:	REV:
DRAFT	MH_9	DP-002	-

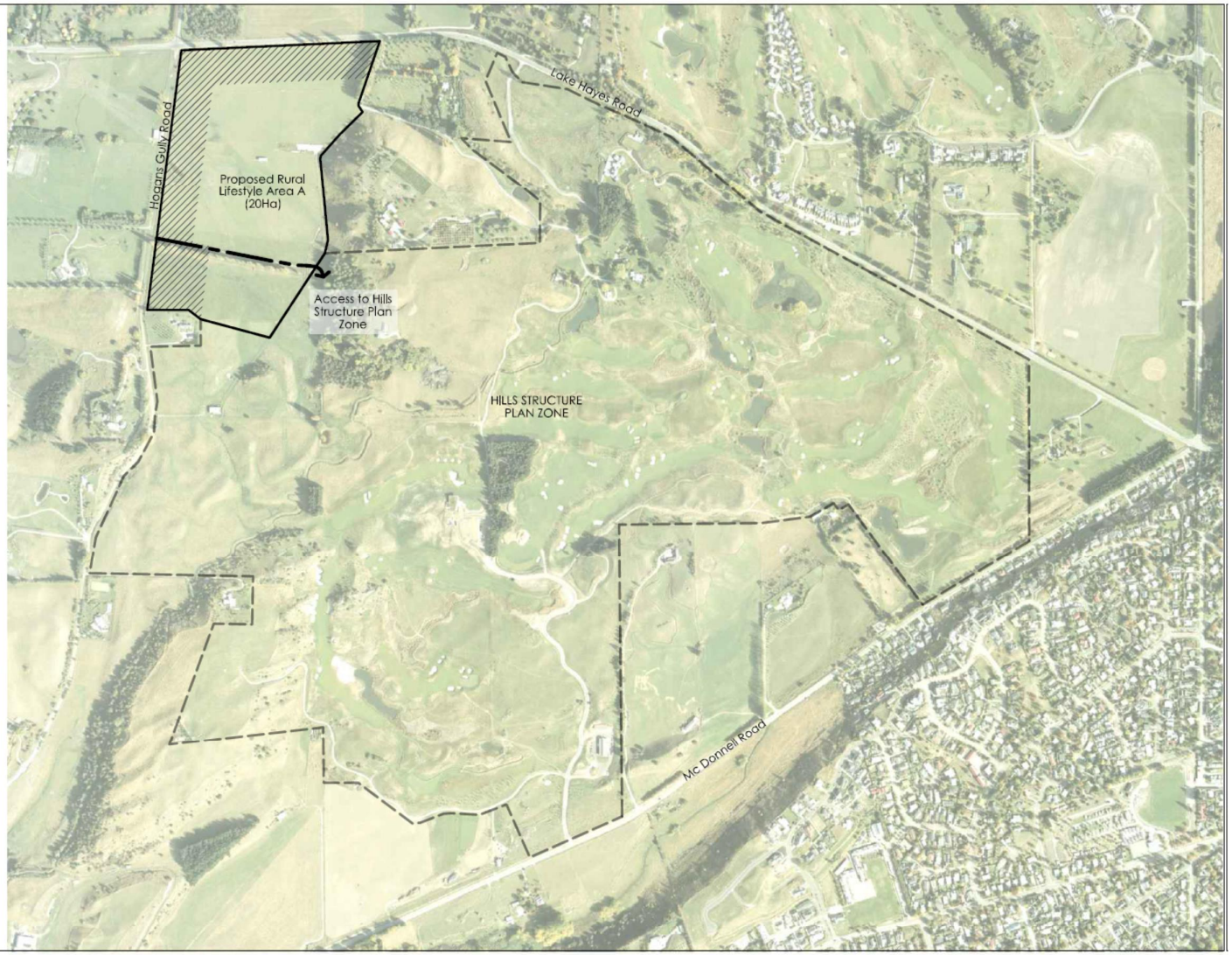
KEY:

Hills Structure Plan Boundary

Proposed zoning Areas

Overlays:

Landscape Amenity Management Area;
Includes tree planting, sited to preserve views of surrounding landscape and partially screen proposed dwellings



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SCALE: 1:4,000 (A1); 1:8,000 (A3)

PLAN STATUS:
DP REVIEW

THE HILLS
PROPOSED RURAL LIFESTYLE AREA A

DRAWN / REVIEWED: RT / JC
APPROVED: DT
DATE: 14.10.15

DRAWING NO:
MH_10_1_MLP_012B

Hogans Gully – Rural Lifestyle Zoning

Preliminary Section 32 Evaluation Report

BROWN&COMPANY
PLANNING GROUP

1. Evaluation of proposed Objective [S32 (1) (a)]

Objective 27.7.21.1

Enable subdivision to Rural Lifestyle densities while maintaining the landscape character of the surrounding area.

The above objective is considered appropriate to address the key resource management issues of the Proposed District Plan review:

- The objective undertakes to outline the acceptable density pattern for the proposed Rural Lifestyle Area.
- Proposed development will be seen from public places, however the design and placement of buildings within the landscape will not detract from the wider landscape. This is because a wide Landscape Amenity Management Area has preserved setback for buildings to retain a level of openness.
- Distinctive landscapes are not being compromised by this development. Further development will be seen as extension of the surrounding rural lifestyle development, and will maintain the landscape character and amenity of the surrounding environment.

2. Evaluation of the proposed provisions S32 (1) (b)

The below table considers whether the proposed provisions are the most appropriate way to achieve the relevant objectives. In doing so, it considers the costs and benefits of the proposed provisions.

Number	***Policy***	***Is the policy the most appropriate way to support the Objective? Is it efficient and effective? Does it support the objectives in the Proposed District Plan?***
27.7.21.1	Subdivision shall be undertaken in accordance with a Structure Plan which provides for appropriate setbacks and landscaping to maintain the landscape character of the surrounding area.	A structure plan provides a framework for development, analysis has already been undertaken as to the appropriateness of the proposed zoning, the Structure plan is mechanism that this can be achieved. Careful design and the use of a structure plan and associated rules can ensure that development has appropriate regard to the landscape and amenity values of the site and the wider environment.
27.7.22.1.2	Require the provision of a Landscape Amenity Management Area to preserve views of the surrounding	Appropriate landscaping will assist softening but not screening development in this proposed zone.

Number	*Policy*	*Is the policy the most appropriate way to support the Objective? Is it efficient and effective? Does it support the objectives in the Proposed District Plan?*
	landscape from public roads while visually softening the appearance of buildings in the zone	A structure plan supported by rules which set out the parameters for this area is an appropriate way to achieve the objectives.
27.7.22.1.3	Avoid linear planting and buildings in the Landscape Amenity Management Area	This policy ensures that the landscape character of the proposed zone is maintained ï an area of planting to soften (but not screen) the development is similar to the environment on the western side of Arrowtown-Lakes Hayes road.

Part 2 of the Act

It is considered the PDP, with the modifications sought in THLôs submission, will achieve the purpose and principles of the Act, for the reasons set out above and for the further reasons below.

It is noted the Rural Residential and Rural Lifestyle Zones are already established zones within the District Plan. The PDP does not make significant changes to these zones, and in fact it amends their structure to allow the building of houses as permitted activities, provided certain thresholds are achieved (in relation to design and appearance etc.).

The PDPôs objectives and policies as notified (and supported by the Councilôs Section 32 evaluation) are generally considered appropriate and are supported. However, it is considered there is other land in the District that is suitable for Rural Lifestyle zoning which should be included in the PDP, in particular the Hogans Gully Rd land the subject of THLôs submission.
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Accordingly, it is considered that:

(a) The evaluation carried out for the PDP as notified did not adequately examine valid alternatives such as those raised in THLôs submission;

(b) The objectives, as sought to be modified by THLôs submission, are the most appropriate way to achieve the purpose of the Resource Management Act; and

(c) The policies and rules, as sought to be modified by THLôs submission, , are the most appropriate way to achieve the relevant objectives, including those contained in Chapters 3 and 22 of the PDP; and

(d) The methods, including the modifications sought in THLôs submission to the PDPôs rules, and the additional site specific rules THL seeks be included in the PDP are the most effective and efficient for achieving the relevant objectives; and

(e) The rezoning, including the provisions to give effect to it, will result in a similar landuse pattern that is already either evident or anticipated/inevitable in the area as a result of already consented and zoned development.

(f) There is no risk of acting (by adopting the modifications sought in THLôs submission) because there is no uncertainty or insufficient information about the rezoning.

Section 6

There are no matters of national important relevant to the Site.

Section 7

The modifications sought in this submission are directly relevant to achieving the following matters to which particular regard must be given:

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

(c) the maintenance and enhancement of amenity values;

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

(g) any finite characteristics of natural and physical resources;

It is acknowledged that there is a finite capacity for residential activity in rural areas. However, the Site the subject of THLôsubmission is located within an area where there is existing residential development, both to the south and the east. The proposed rezoning includes controls (primarily the Structure Plan and Landscape Amenity Management Area) that will ensure the amenity values, landscape character and quality of the surrounding and wider environment will be maintained. The site is relatively small (20ha) and can not be used efficiently as a stand alone farming unit or productive land. Rural lifestyle residential development of the nature proposed is therefore considered appropriate.

Section 5

With the modifications sought to the PDP by THLôs submission, the PDP will achieve the sustainable management purpose of the Act by enabling people and communities of the District to provide for their collective well-being and safety in a manner that: sustains the potential of the natural and physical resources of the Rural Lifestyle Zone for future generations; will continue to safeguard the life-supporting capacity of air, water, soil, and ecosystems; and will avoid or mitigate potential adverse landscape effects.

The purpose of the Act is therefore achieved by the PDP, if the modifications sought by THLôs submission are allowed.

The Hills

Masterplanning Report – Rural Lifestyle Zone A (Hogans Gully)
Prepared for District Plan Review

21 October 2015

Prepared by Darby Partners

The Hills property is located to the south west of Arrowtown. The majority of the property has been developed into a world class golf course.

The site, where Rural Lifestyle Area A (20 ha) is proposed is located at the intersection of Hogan Gully and Arrowtown - Lake Hayes Road, within the south-western corner of the Hills property.

Topography is flat farmland, with the terrace escarpment rising to the north of the site towards the rest of the Hills property. To the west, on the other side of Lake Hayes Road is zoned Rural Residential and Rural General in the existing QLDC District Plan. To the south, on the other side of Hogans Gully Road is zoned Rural Lifestyle. The site is currently zoned Rural General.

The proposal seeks to zone the site Rural Lifestyle to allow 2Ha average Lot size, continuing the existing settlement pattern in the area. This zoning would allow up to 10 lots at 2 hectare density. Dwellings will be allowed up to 8m in height and subject to QLDC's Guide to Suitable Building Colours and Materials in Rural Zones.

As part of the subdivision consent, a Structural Landscape Plan will identify buildings platforms, internal lot boundaries, access ways and the planting framework.

The plan will include the Landscape Amenity Management Area (LAMA) as indicated on the proposed plan. This area is 112m in width to the east of the proposed access to Hills Structure Plan, and 75m width to the west.

The purpose of the LAMA is to preserve views of the surrounding landscape from public roads while partially screening, or visually softening proposed dwellings through landscape treatment. The setback also allows a zone of open space / landscaping to ensure that dwellings will not be overly prominent or close to the road and preserves rural character.

Landscape treatment within the LAMA is intended to include predominantly deciduous tree and hedge planting, with no dwellings to be located in this zone. The Structural Landscape Plan will ensure that the planting will be rural in character rather than an overly domesticated appearance.

KEY:

Hills Structure Plan Boundary

Proposed zoning Areas

Overlays:

Landscape Amenity Management Area:
Includes tree planting, sited to preserve views of surrounding landscape and partially screen proposed dwellings

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SCALE: 1:4,000 (A1); 1:8,000 (A3)

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PLAN STATUS:

DP REVIEW

THE HILLS
PROPOSED RURAL LIFESTYLE AREA A

DRAWN / REVIEWED: RT / JC
APPROVED: DT
DATE: 14.10.15

DRAWING NO:
MH_10_1_MLP_012B

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The Hills Rural Lifestyle Zone A

QLDC DPR Submission

Landscape and Visual Amenity Graphic Supplement
October 2015

Boffa Miskell

The Hills Rural Lifestyle Zone A

QLDC DPR Submission

Landscape and Visual Amenity Graphic Supplement
October 2015

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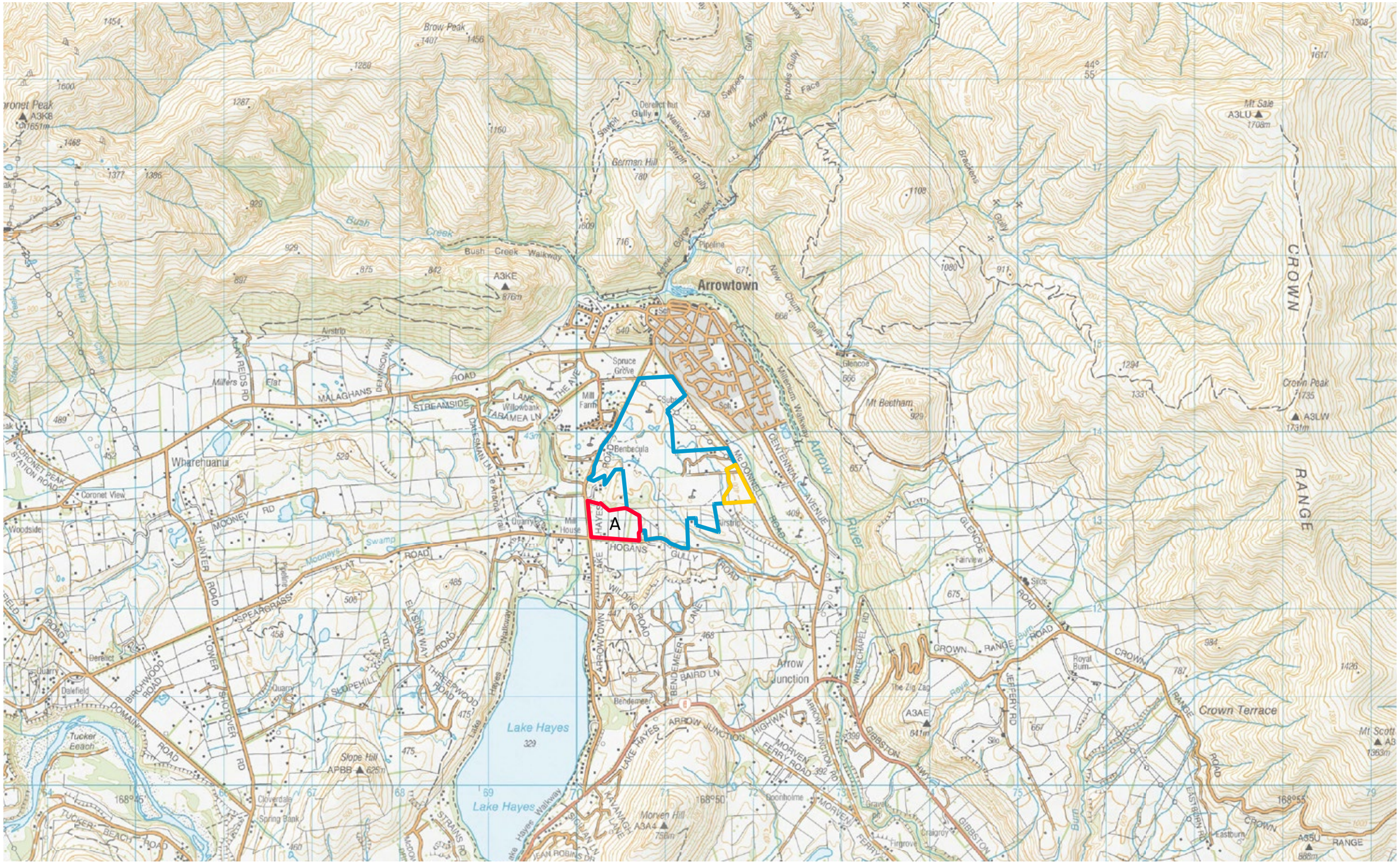

Boffa Miskell
www.boffamiskell.co.nz

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Data Sources: Map sourced from Topo50 series. Crown Copyright Reserved

Projection: NZGD 2000 New Zealand Transverse Mercator.

Legend

- 🟦 Proposed Hills Resort Zone
- 🟥 Proposed Rural Lifestyle Zone A
- 🟨 Proposed Rural Lifestyle Zone B

THE HILLS RURAL LIFESTYLE ZONE A, QLDC DPR SUBMISSION

Figure 1: Site Location

| Date: October 2015 | Revision: 0 |

Plan prepared by Boffa Miskell Limited

Project Manager: **james.bentley@boffamiskell.co.nz** | *Drawn:* MWa | *Checked:* JBe

Figure 1

File Ref: C15130_001_Graphics_RLA.indd

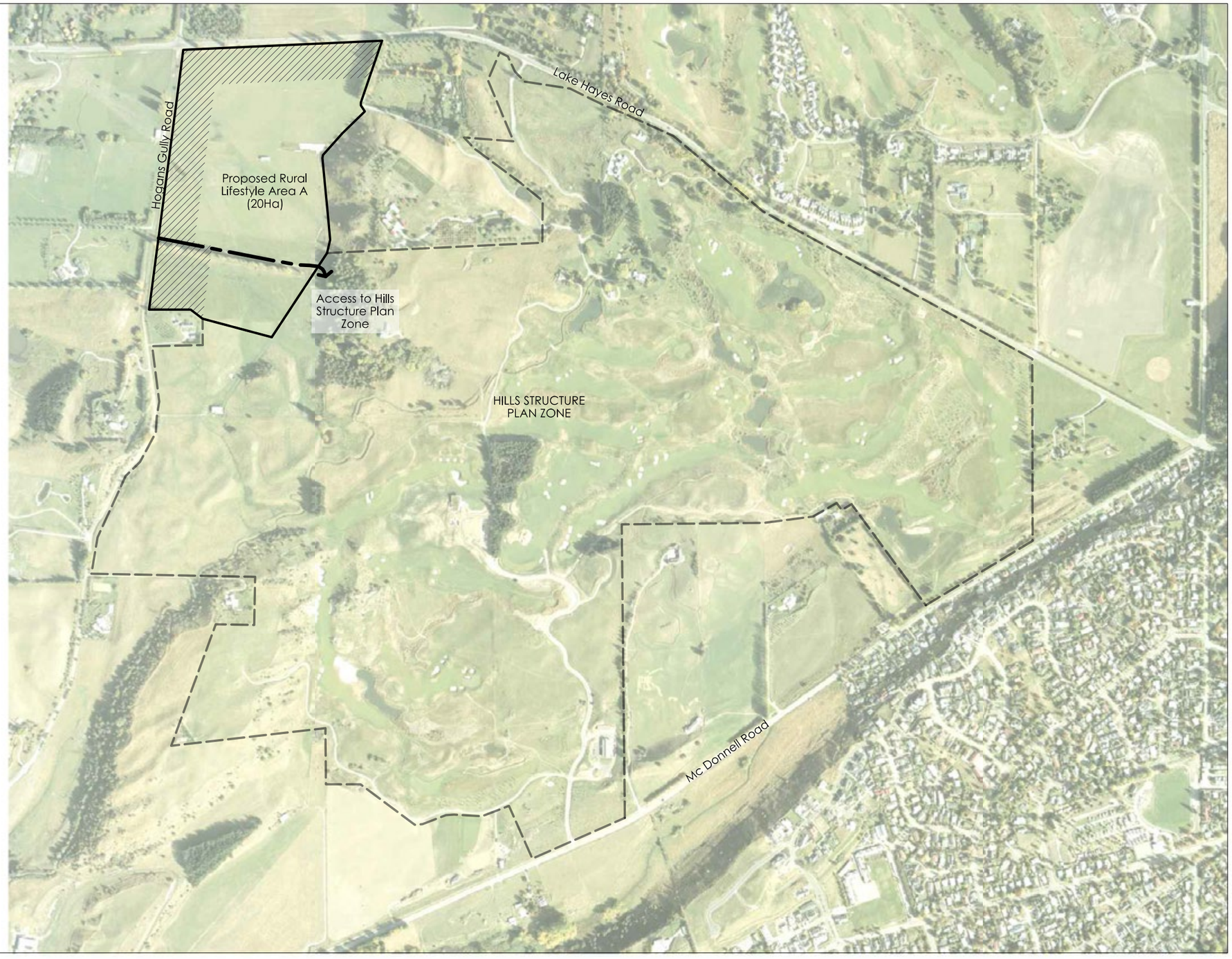
KEY:

Hills Structure Plan Boundary

Proposed zoning Areas

Overlays:

Landscape Amenity Management Area:
Includes tree planting, sited to preserve views of surrounding landscape and partially screen proposed dwellings



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DP REVIEW

THE HILLS
PROPOSED RURAL LIFESTYLE AREA A

DRAWN / REVIEWED: RT / JC
APPROVED: DT
DATE: 14.10.15

DRAWING NO:
MH_10_1_MLP_012B

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Data Sources: Darby Partners

Projection: NZGD 2000 New Zealand Transverse Mercator.

THE HILLS RURAL LIFESTYLE ZONE A, QLDC DPR SUBMISSION

Figure 2: Plan for Proposed Rural Lifestyle Area A

| Date: October 2015 | Revision: 0 |

Plan prepared by Boffa Miskell Limited

Project Manager: **james.bentley@boffamiskell.co.nz** | *Drawn:* MWa | *Checked:* JBe

Figure 2
PAGE 4

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Data Sources: Photograph taken by Yvonne Pfluger, Boffa Miskell Limited. June 14, 2015

Projection: NZGD 2000 New Zealand Transverse Mercator.

Legend

Proposed Rural Lifestyle Zone A

THE HILLS RURAL LIFESTYLE ZONE A, QLDC DPR SUBMISSION

Figure 3: Oblique Aerial Photograph

| Date: October 2015 | Revision: 0 |

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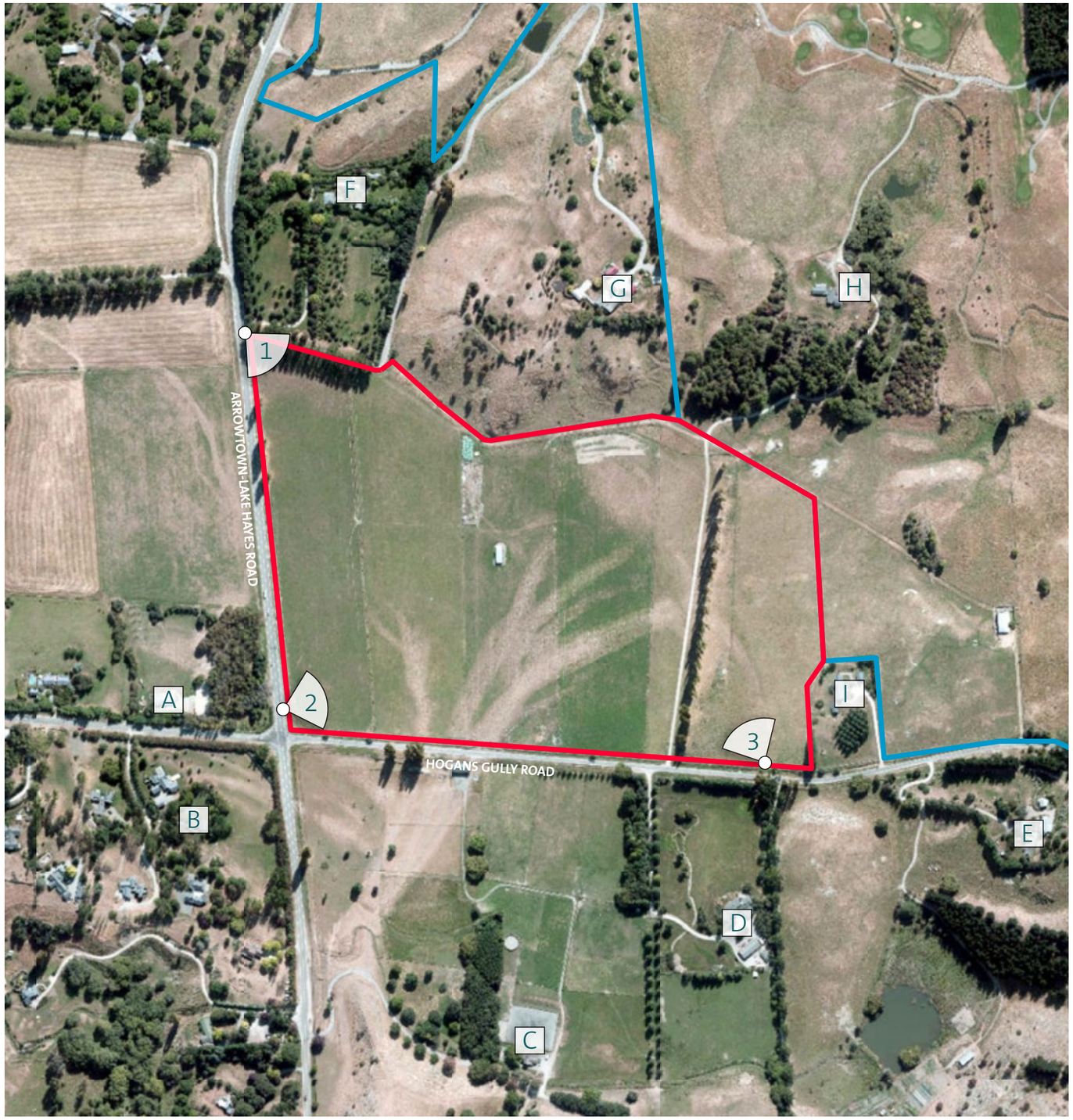
Figure 3

File Ref: C15130_001_Graphics_RLA.indd



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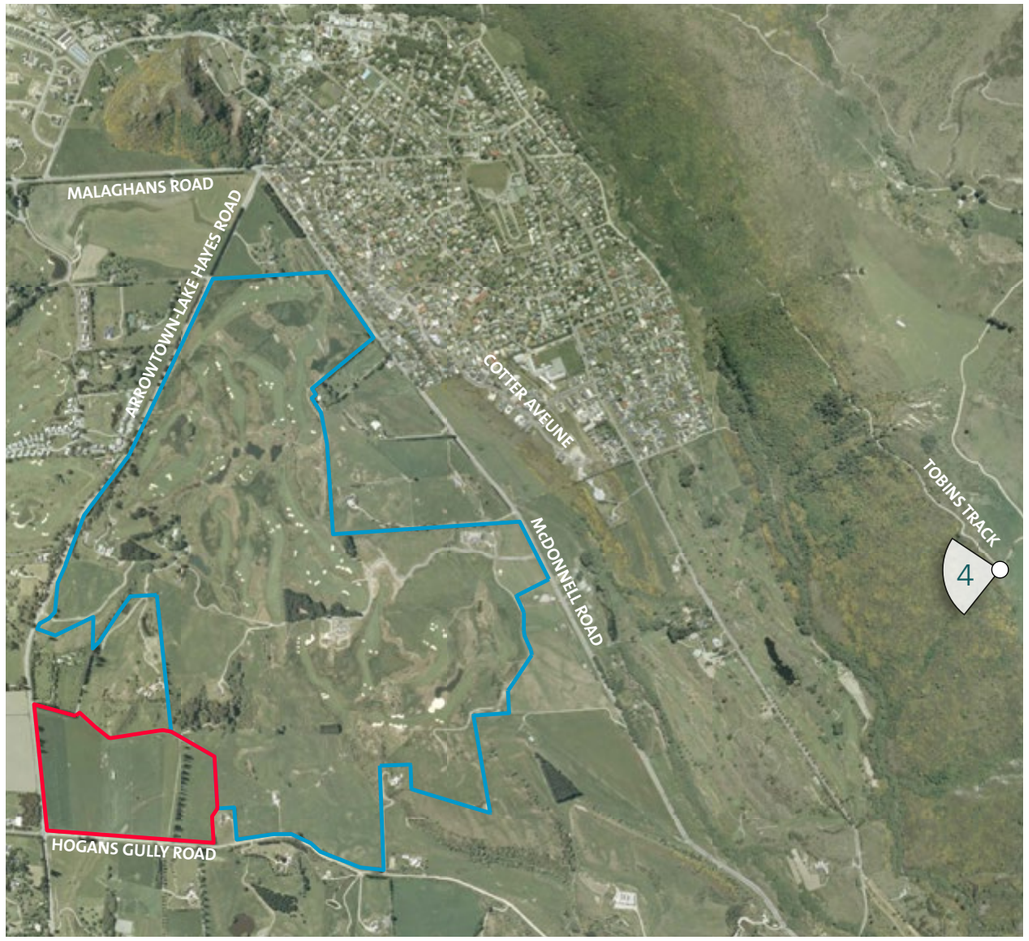

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*Refer to written report for the identification descriptions of the lettered houses identified above.

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Data Sources: Aerials sourced from http://qldcmaps.qldc.govt.nz/arcgis/services, Copyright Reserved by Queenstown Lakes District Council.

Projection: NZGD 2000 New Zealand Transverse Mercator.

Legend

- Proposed Hills Resort Zone
- Proposed Rural Lifestyle Zone A

THE HILLS RURAL LIFESTYLE ZONE A, QLDC DPR SUBMISSION

Figure 4: Site Context Photograph Locations

| Date: October 2015 | Revision: 0 |

Plan prepared by Boffa Miskell Limited

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Figure 4

Site Context Photograph 1: Photograph looking in a south-easterly direction towards the Site from a location off Arrowtown- Lake Hayes Road.

Site Context Photograph 2: Photograph taken from a location on Arrowtown - Lake Hayes Road looking in an easterly direction towards the Site

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Data Sources: Photographs taken by Yvonne Pfluger, Boffa Miskell Limited. June 14, 2015.

THE HILLS RURAL LIFESTYLE ZONE A, QLDC DPR SUBMISSION

Figure 5: Site Context Photographs 1, 2

| Date: October 2015 | Revision: 0 |

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Site Context Photograph 3: Photograph taken from a location on Hogans Gully Road looking northwards towards the Site

Site Context Photograph 4: Photograph taken from a location on Tobins Track, above Arrowtown, looking in a south-westerly direction towards the Site

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Data Sources: Photographs taken by Yvonne Pfluger, Boffa Miskell Limited. June 14, 2015.

THE HILLS RURAL LIFESTYLE ZONE A, QLDC DPR SUBMISSION

Figure 6: Site Context Photographs 3, 4

| Date: October 2015 | Revision: 0 |

Plan prepared by Boffa Miskell Limited

Project Manager: **james.bentley@boffamiskell.co.nz** | *Drawn:* MWa | *Checked:* JBe

Figure 6

Hogans Gully Lifestyle Zone

Queenstown Lakes District Plan Review

Transportation Assessment Report

October 2015

TDG Ref: 13470 151021 hogans gully lifestyle zone rep.docx

452

Hogans Gully Lifestyle Zone

Queenstown Lakes District Plan Review

Transportation Assessment Report

Quality Assurance Statement

Prepared by:

Cameron Bradley

Transportation Planner

Reviewed by:

Tony Penny

Principal Consultant

Approved for Issue by:

Chris Rossiter

Principal Transportation Engineer

Status: Final report

Date: 21 October 2015

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Table of Contents

1. Introduction

Trojan Helmet Limited proposes the creation of a rural lifestyle zone on the edge of The Hills Golf Course near Arrowtown. The proposed zone has an area of 19.7 hectares and would enable development of up to 10 dwellings.

The report provides a description of the existing transport infrastructure in the vicinity of the zone and existing travel patterns. This is followed by a description of the transport components of the proposed development and the expected traffic generation of the development enabled by the rezoning. This forms the basis of the assessment of traffic effects and the assessment against the transport rules of the District Plan.

2. Existing Transport Infrastructure

2.1 Site Location

The proposed zone is bounded by Arrowtown-Lake Hayes Road to the west, Hogans Gully Road to the south and by The Hills golf course to the north and east. The land is currently zoned as Rural General in the Operative Queenstown Lakes District Plan ("District Plan").

Figure 1 also shows the location of the site in relation to the road hierarchy as defined in the District Plan.

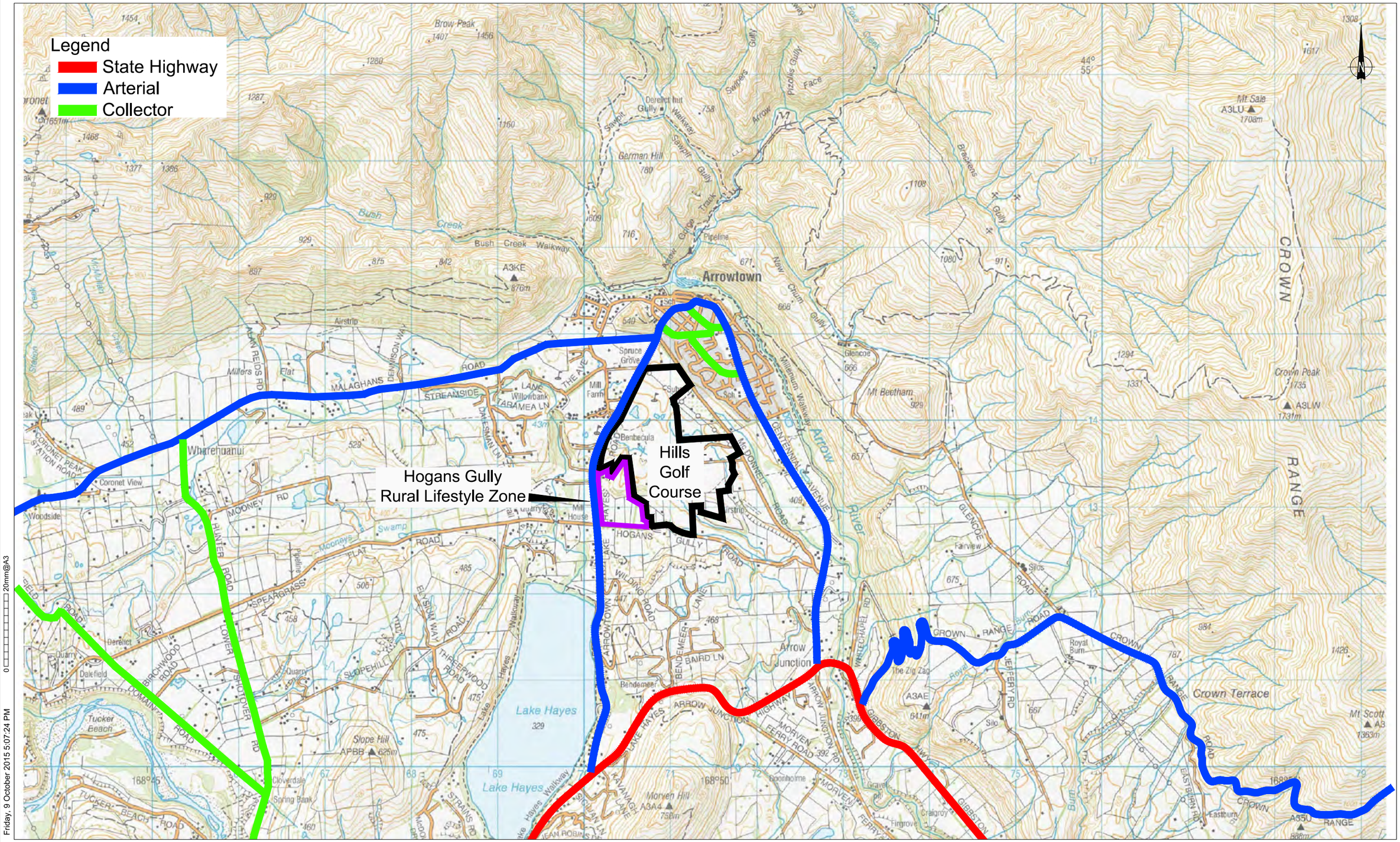
2.2 Roading Network

On the west side of the site, Arrowtown-Lake Hayes Road is classified as an Arterial Road with a role of being a dominant element in the road network, connecting the major settlements with the District. The District Plan states that arterial roads will be managed to minimise their local access function. McDonnell Road runs in a generally northwest-southeast direction and is defined as a local road in the vicinity of the site. Local roads are described by the District Plan as functioning almost entirely as accessways to properties and are not intended to act as through-routes for vehicle travel. Hogans Gully Road along the southern side of the site is also a local road.

2.3 Roading Form

In the vicinity of the site, Arrowtown-Lake Hayes Road has a seal width of 8.0m to 8.5m. No footpaths are provided in this location.

The speed limit along the section of Arrowtown-Lake Hayes Road near the site is 70 km/h, except near its intersections with McDonnell Road (to the north) where the speed limit changes to 50km/h.



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REV	DATE	DRN	CHK	DESCRIPTION
A	09.10.15	CTM	----	Base Boffa Miskell : The Hills Resort Zone, QLDC DPR Submission (Sept2015)
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Hogans Gully Rural Lifestyle Zone
Site Location

Boffa Miskell
www.boffamiskell.co.nz

DRAWN: CTM --- ---
DATE: 09.10.15 STATUS: ---
SCALE: NTS
DWG NO:13470A2A

TDG

1

Photograph 1: Arrowtown-Lake Hayes Road, Looking North Past Hogans Gully Road

At its northern end, Arrowtown-Lake Hayes Road intersects with McDonnell Road and Malaghans Road. This intersection is in the form of a 'GIVE WAY' priority-controlled, cross-road intersection, with priority given to Arrowtown-Lake Hayes Road.

Photograph 2: Arrowtown-Lake Hayes Road Looking South Past McDonnell Road

McDonnell Road in the vicinity of the site access has a seal width of approximately 7.0m, with unsealed shoulders of between 2.2m and 2.5m on both sides of the carriageway. It has a speed limit of 80 km/h except for 1 km of the northern section within the urban area where the speed limit is 50 km/h. In this section of McDonnell Road speed humps have been installed with an advisory negotiation speed of 25 km/h.

Photograph 3: McDonnell Road, Looking North at Existing Golf Course Entrance

Photograph 4: McDonnell Road, Looking South at Existing Golf Course Entrance

No sealed footpaths are provided on McDonnell Road in the vicinity of site. An unsealed track is provided on the western side of McDonnell Road separated from the sealed carriageway, from the northern end of the site through to the intersection with Hogans Gully Road. In the vicinity of the Hogans Gully Road intersection this walking track switches to the eastern side of McDonnell Road, before extending further south through to the intersection with Centennial Avenue.

Photograph 5: McDonnell Road, Looking North at Existing Golf Course Access with the Unsealed Walking Track on the Western Side

Photograph 6: Hogans Gully Road, Looking East

At the southern boundary of the site, Hogans Gully Road runs in a generally east-west direction. At its western end it intersects with Arrowtown-Lake Hayes Road and Speargrass Flat Road. To the east Hogans Gully road terminates at a T-intersection with McDonnell Road. Both the intersections with Arrowtown-Lake Hayes Road and McDonnell Road are priority controlled, with Hogans Gully Road being restricted in both cases by a "GIVE WAY' control.

Photograph 7: Hogans Gully Road, Looking Towards Intersection with McDonnell Road

Hogans Gully Road has an 80 km/h speed limit. It is unsealed and has a formed width of about 5.2m. In the vicinity of Arrowtown-Lake Hayes Road there are grass verges of 6.2m and 1.7m on the southern and northern side of the road respectively. Further east the road winds over a hilly section and the verges vary in width. Footpaths are not provided on either side of Hogans Gully Road.

Photograph 8: Hogans Gully Road, Looking Towards Intersection with Arrowtown-Lake Hayes Road

It is understood that Queenstown Lakes District Council has no plans for the sealing of Hogans Gully Road.

3. Current and Future Travel Patterns

3.1 Traffic Volumes

Table 1 shows the most recent daily traffic count data for roads in the vicinity of the site collected from records held by the Queenstown Lakes District Council.

Road Section	ADT (vpd)	Count Date
Arrowtown-Lake Hayes Rd, north of Hogans Gully Rd	3,157	November 2010
Arrowtown-Lake Hayes Rd, south of McDonnell Rd	2,978	June 2005
Malaghans Rd, west of Arrowtown-Lake Hayes Rd	1,522	November 2011
McDonnell Rd, east of Arrowtown-Lake Hayes Rd	847	February 2013
McDonnell Rd, east of Arrowtown-Lake Hayes Rd	403	April 2005
McDonnell Rd, north of Hogans Gully Rd	257	February 2004
Hogans Gully Rd, west of McDonnell Rd	133	March 2012
Hogans Gully Rd, east of Arrowtown-Lake Hayes Rd	137	May 2005

Table 1: Daily Traffic Counts

The traffic volumes to the south-west of Arrowtown show the strength of the town's relationship with Queenstown. The other roads surrounding the site have relatively low traffic counts. However a significant amount of growth can be seen on McDonnell Road traffic in the past 10 years.

3.2 Provision of Public Transport

Connectabus runs the Number 10 route from Arrowtown to Queenstown which operates 13 times a day between 7:35am and 9:35pm. Six of these services run via Arthurs Point, the other seven travel down Arrowtown-Lake Hayes Road and through Frankton down State Highway 6 to Queenstown. Passengers may interchange onto Kelvin Heights, Sunshine Bay, Fernhill, Quail Rise, Wanaka or a number of other places including Remarkables Park and the airport. Connectabus also runs a service to Wanaka twice daily.

There are several smaller operators targeted towards tourists who offer services from Queenstown to Arrowtown and vice versa, often allowing stops along the way. There is also a school bus which operates down Hogans Gully Road.

3.3 Travel to Work

It has been identified from the 2013 census, that there were 2,445 people living in Arrowtown and 699 jobs there. Of these jobs 261 were taken by employees who commute to Arrowtown from a different area, primarily Queenstown and Frankton, while the remaining 438 jobs were taken by residents of Arrowtown. There were 741 people who commute out of Arrowtown for work, again mainly to Queenstown and Frankton. The largest percentage commuting increase from 2006 to 2013 was people commuting to

Arrowtown, which increased by 55% or 93 people. However the number commuting out of Arrowtown also increased by 17%, or 103 people. Further increases in these commuting patterns will lead to increases, primarily in the peak hour, of traffic volumes using Arrowtown-Lake Hayes Road, and particularly the intersection with Malaghans and McDonnell Roads.

Of those who travelled to work on the census day in 2013, the overwhelming majority, (84% or 867 people) drove a vehicle to get there. This number remained relatively consistent with 2006, where 852 people drove. Cycling's share of travel choice has had an increase of 3% between 2006 and 2013 (33 people), but walking remained the second most popular mode of travel to get to work with 84 commuters (8%) choosing this method. There was also an increase of 40% in people who work from home, jumping from 105 in 2006 to 147 in 2013.

3.4 Road Safety

The New Zealand Transport Association Crash Analysis System (CAS) has been used to identify all reported accidents on Arrowtown-Lake Hayes Road, McDonnell Road, and Hogans Gully Road, between and inclusive of their respective intersections. The search covered all reported crashes for the period between 2008 and the present.

A total of 18 crashes were reported within this area, with six crashes resulting in minor injuries. There have been no crashes which resulted in fatal or serious injuries in this area since 2008.

Eleven of these crashes occurred on Arrowtown-Lake Hayes Road, three of these causing minor injuries. Two of these injury crashes were the result of drivers failing to give way at the intersection of McDonnell Road and the other at the intersection of McDonnell Road was caused by following too closely.

Four crashes on Arrowtown-Lake Hayes Road had rain, snow, frost or ice as a factor in the cause, with two of these located 100m and 500m north of Waterfall Park Road. Neither of these crashes involved injuries.

There were four recorded crashes on Hogans Gully Road, all due to loss of control from the unsealed road, frost or ice or speed. The speed related crash resulted in a head on collision, but no injuries. Three crashes were recorded on McDonnell Road, with two of these caused by intoxicated drivers hitting parked vehicles.

Overall seven of the eighteen crashes recorded were affected by environmental factors, made up of narrow, unsealed, frosty or icy roads. Three crashes were attributed down to alcohol and six to driver error at intersections. Three of these occurred at the intersection of Arrowtown-Lake Hayes Road / McDonnell Road and three at the intersection of Arrowtown-Lake Hayes Road / Hogans Gully Road.

No crashes occurred at existing driveways to The Hills property or adjacent properties.

4. Future Changes

4.1 Queenstown Lakes District Council

On 30 June 2015 Queenstown Lakes District Council (QLDC) adopted their 10 year land transport plan (2015-2025). There are no specific changes to the transportation network around Arrowtown planned. However, the report did have a key objective to reduce growth in vehicle use by promoting greater use of other transport modes. This will be achieved by:

- Increasing affordability and convenience of public transport; and
- Making cycling and walking easier and safer.

4.2 The Arrowtown Plan

A Strategic Planning document outlining the future growth and community planning proposals for Arrowtown has been prepared. This Plan resulted from a community planning workshop carried out in February 2003 with the aim of reviewing and updating Arrowtown planning. It should be noted that this document does not have formal statutory status, but is a statement of community desire. Amongst the issues outlined in this Plan was traffic management, and the comments relating to relevant sections of the road network are referenced below:

- McDonnell Road was installed as a heavy traffic route being described as providing a logical bypass to the town and good access to the industrial area;
- In time, the Malaghans / Arrowtown-Lake Hayes / McDonnell intersection may need improvement. However, a threshold treatment involving planting is envisaged to assist in speed management. There was not full support for a roundabout solution;
- From Arrowtown-Lake Hayes Road adequate signage and encouragement is needed to ensure heavy traffic is routed along Malaghans Road to the industrial area.

It is noted that McDonnell Road has since been sealed and speed humps installed. However no other actions have evolved that have a confirmed timeframe.

4.3 Wakatipu Trails

The Wakatipu Trails Strategy, released in May 2004 was prepared to guide development of an integrated network of walking and cycling trails and cycle-ways in the Wakatipu Basin. Preparation of the strategy was initiated by the Wakatipu Trails Trust is association with Transfund and Queenstown Lakes District Council. The Strategy identified a series of desired outcomes with those relevant to The Hills site listed below:

- Construction of a premier walking and cycling trail linking Queenstown to Arrowtown via Lake Hayes;
- Improvements to rural roads to accommodate horse riding and road cycling;
- New trail signs, publications and information on trails.

An extensive range of walking and cycling tracks have now been developed within the Queenstown and Arrowtown area. One of the routes constructed links Arrowtown with the Historic Shotover Bridge. This follows Manse Road from Arrowtown and passes through the Millbrook resort to Lake Hayes and does not cross any part of The Hills golf course land.

5. Levels of Service

5.1 Vehicles

The AUSTROADS Guide to Traffic Engineering Practice Part 2 ('Roadway Capacity') provides a generalised measure for the capacity and performance of a route. This concept of level of service indicates that with the existing traffic flows, Arrowtown-Lake Hayes Road, McDonnell Road and Hogans Gully Road retain a condition of free flow in which individual drivers are virtually unaffected by the presence of other vehicles in the traffic stream, have freedom to select their own desired speeds and generally experience high levels of comfort and convenience.

5.2 Road Safety

Based upon the information from the Land Transport New Zealand Crash Analysis System (CAS), it does not appear that there are any underlying road safety issues on Arrowtown-Lake Hayes Road. Since McDonnell Road has been sealed, the number of loss of control crashes on this road has reduced. If Hogans Gully Road were to be sealed, this would also yield a reduction in this type of crash. The traffic effects of the proposal are not considered to be sufficient reason for sealing because the expected volume changes on Hogans Gully Road will be minimal.

6. The Proposal

Trojan Helmet Limited proposes that 19.7ha of land bounded by Arrowtown-Lakes Hayes Road, Hogans Gully Road and The Hills golf course is rezoned from Rural General to Rural Lifestyle to enable development of up to ten dwellings.

It is understood that access to the rural lifestyle properties will be provided via a 5.5m wide, two lane road connecting to Hogans Gully Road.

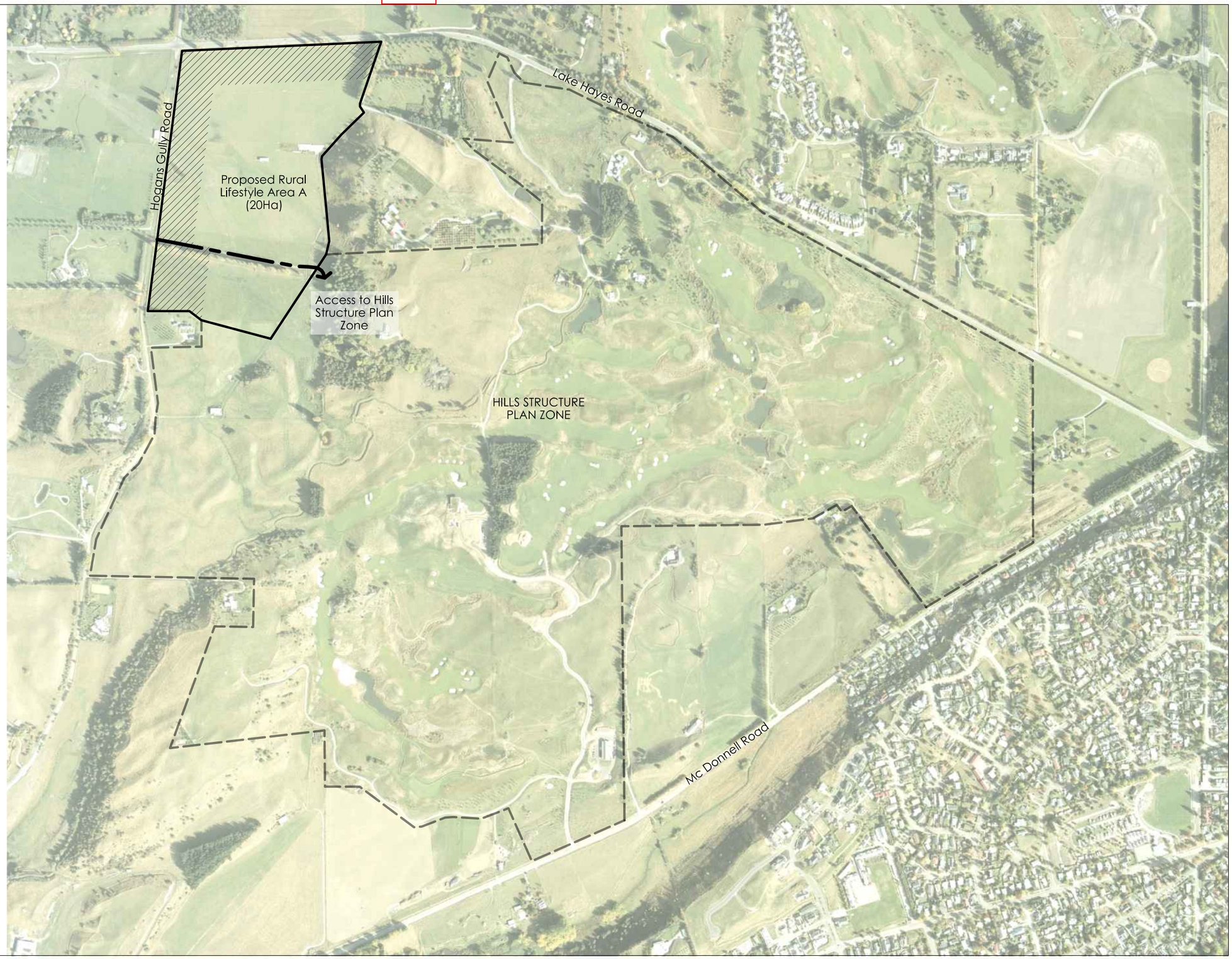
KEY:

Hills Structure Plan Boundary

Proposed zoning Areas

Overlays:

Landscape Amenity Management Area:
Includes tree planting, sited to preserve views of surrounding landscape and partially screen proposed dwellings



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SCALE: 1:4,000 (A1); 1:8,000 (A3)

0 100 200 300

PLAN STATUS:

DP REVIEW

THE HILLS
PROPOSED RURAL LIFESTYLE AREA A

DRAWN / REVIEWED: RT / JC
APPROVED: DT
DATE: 14.10.15

DRAWING NO:
MH_10_1_MLP_012B

7. Traffic Generation and Distribution

7.1 Traffic Generation

The site is currently used for rural purposes and has a very low traffic generation. The proposed rural lifestyle zone would enable development of up to ten dwellings.

The Transfund NZ Research Report 209: "Trips and Parking Related to Land Use" includes daily rates of between 6 and 9 vehicles per day (vpd) (IN+OUT) for rural residential subdivisions. It notes that these rates are lower than for urban residences and "reflect the increased trip linking which occurs when the primary employment trip is longer, e.g. greater than 20 minutes, as with rural lifestyle properties located on the outskirts of an urban area". For the purposes of this assessment, a rate of 8vpd per unit has been adopted. On this basis, ten dwellings could generate about 80 vehicle movements on average per day.

Residential activity typically generates a high proportion of outbound movements during the morning peak period (80%) with a more balanced pattern in the evening, 35% outbound and 65% inbound.

During the typical commuter peak periods, residential activity will generate about one vehicle movement per hour per dwelling on average. On this basis, the proposed rezoning could result in an additional ten vehicle trips being generated.

7.2 Trip Distribution

It is anticipated that access to the properties will be provided from Hogans Gully Road. With Arrowtown-Lakes Hayes Road forming the nearest arterial road, it is expected that the majority of vehicle movements will be from the site access to this road. Since the major employment centres in the area are Frankton and Queenstown, vehicle movements at the intersection will predominantly be to and from the South.

8. Assessment of Rezoning Effects

8.1 Effects on Roading Network

The AUSTROADS Guide to Traffic Management Part 3 ("Traffic Studies and Analysis") currently recommends that unsignalised intersections are evaluated using SIDRA intersection analysis software or an equivalent tool. This advice supersedes previous recommendations that detailed analysis of low volume driveways was not normally required because capacity was unlikely to be a critical factor.

The following table shows the traffic volume thresholds previously adopted by Austroads below which detailed analysis was not considered necessary and the expected traffic volumes at the resort zone access points. The peak hour traffic volumes on the frontage roads have been estimated as 10% of the average daily traffic volumes.

Intersection	Major Road Flow (vph)	Minor Road Flow (vph)
AUSTROADS Guide to Traffic Management	400	250
Two-lane Road	500	200
Peak Hour Capacity Combinations	650	100

Table 2: Intersection Capacity – Uninterrupted Flow Conditions (PM Peak)

The existing peak hour traffic volumes on Arrowtown-Lake Hayes Road are below 400vph and on Hogans Gully Road are less than 20vph. The proposed rezoning could increase the peak hour traffic volume on Hogans Gully Road to about 30vph. This remains well below the thresholds at which a detailed analysis of the Hogans Gully Road / Arrowtown-Lake Hayes Road intersection would be considered necessary. On this basis, the proposed development is not expected to have any adverse effect on the road network at these locations.

8.2 Buses, Cyclists and Pedestrians

The increase of traffic flow due to the proposal is not expected to affect the level of service provided to cyclists and pedestrians. The increase in traffic volume represents about one extra vehicle every five minutes which not be noticeable.

It is anticipated that the demand for public transport services would only increase marginally as a result of this proposal and will not affect the potential provision of possible future services in the area.

8.3 Access Arrangements

It is understood that access to the rural lifestyle properties will be provided via a 5.5m wide, two lane road connecting to Hogans Gully Road. Hogans Gully Road has a straight and level alignment east of Arrowtown-Lake Hayes Road and it is considered that there are no reasons why an intersection could not be formed that meets the best practice design standards.

9. Compliance with Planning Requirements

9.1 District Plan Requirements

The site currently lies within the Rural General Zone in the District Plan. The District Plan sets out a number of rules relating to the transport related elements of any development proposal which are relevant to the proposed rezoning because of the details included in the proposed structure plan. The relevant rules are set out below for the additional visitor accommodation and residential dwelling units associated with the proposed rezoning.

Criterion
Rule 14.2.4.1 (i) (Table 1, Page 14/14)   *Residential units require 2 spaces per unit, while visitor accommodation units require 1 space per unit (2 spaces per unit Plan Change 8), plus one staff space per 10 units, plus one coach space per 30 units.*
Rule 14.2.4.1 (iv)   *All vehicular access shall be in accordance with the standards contained in NZS4404:1981 including updates.*
Rule 14.2.4.2 (ii)   *Vehicle crossings providing access to a road in a Rural Zone shall comply with the Appendix 7, Diagram 2 (Private Access) or Diagram 4 (Commercial Access).*
Rule 14.2.4.2 (iv)   *The minimum sight distance for an access in an 80km/h zone serving a residential activity is 115m, or 170m for a non-residential activity. The minimum sight distance in a 100km/h zone is 170m for a residential activity or 250m for a non-residential activity.*
Rule 14.2.4.2 (v)   *Maximum number of vehicle crossings for a site frontage greater than 100m and onto a local road is three (or two onto an Arterial).*
Rule 14.2.4.2 (vi)   *The minimum distance between any vehicle access onto an arterial road and an intersection with a local road shall be 100m (100 km/h speed limit). For a vehicle crossing on a local road the minimum distance from an intersection with an arterial or local road is 25m (80 km/h speed limit).*

Table 3: Existing Relevant Rules of the District Plan

No additional transport rules are considered necessary because all new roads and vehicle crossing locations are subject to existing rules to ensure that they can operate safely.

10. Summary and Conclusions

Trojan Helmet Limited proposes that 19.7ha of rural general land by The Hills Golf Course is rezoned as rural lifestyle to enable development of up to 10 dwellings. This review of the potential traffic generation of the land and associated effects has concluded that the proposal would not lead to any noticeable traffic effects on the existing road network. Since no changes to the road network are required apart from the construction of the new access to service the dwellings, the proposed rezoning can be supported from a transport perspective.

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hadley consultants LTD

CONSULTING ENGINEERS STRUCTURAL / CIVIL / PROJECT MANAGEMENT / GEOTECHNICAL

Trojan Helmet Ltd

Proposed Rural Lifestyle Area A

Proposed District Plan Submission

Infrastructure Feasibility Report

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Revision	Author:		Reviewer:		
	Name	Signature	Name	Signature	Date
A (Initial Issue)	J. McCartney		J. Hadley		21 October 2015
B (For Submission)	J. McCartney		J. Hadley		22 October 2015

Limitations

This report has been written for the particular brief to HCL and no responsibility is accepted for the use of the report for any other purpose, or in any other context or by any third party without prior review and agreement.

In addition, this report contains information and recommendations based on information obtained by inspection, sampling or testing at specific times and locations with limited site coverage as outlined in this report. This report does not purport to completely describe all site characteristics and properties and it must be appreciated that the actual conditions encountered throughout the site may vary, particularly where ground conditions and continuity have been inferred between test locations. If conditions at the site are subsequently found to differ significantly from those described and/or anticipated in this report, HCL must be notified to advise and provide further interpretation.

Contents

1. Introduction

This report has been prepared to inform a Submission on Queenstown Lakes District Council's (QLDC) Proposed District Plan to re-zone approximately 19.7 hectares of land near Arrowtown from Rural General to Rural Lifestyle zone ("the site"). The Submission is to be made by Trojan Helmet Limited (THL).

The site is located adjacent to Hogans Gully Road and Arrowtown – Lake Hayes Road. The site is contained in two parcels held by differing entities and is currently zoned Rural General under the Operative Queenstown Lakes District Plan.

THL seeks the re-zoning of the site to Rural Lifestyle, thereby enabling development of up to 10 new dwellings.

THL has engaged Hadley Consultants Limited (HCL) to investigate and report on the feasibility of providing utility services and the necessary development infrastructure for the development of the site.

This report considers the nature of the proposed development, the site conditions affecting the implementation of the necessary utility services and development infrastructure and describes the proposed implementation of the following elements:

- Water supply reticulation,
- Wastewater reticulation,
- Stormwater control, and
- Natural Hazards.

2. Nature of Proposed Development

THL proposes to rezone the existing site near Arrowtown. The site, located to the south of Arrowtown and covering 19.7 hectares will cover land legally described as:

- Lot 6 Deposited Plan 392663, comprising 15.0399 ha, owned by Richard Michael Hill, Ann Christine Hill and Veritas Hill Limited.
- Part of Lot 4 Deposited Plan 392663, comprising 53.2908 ha, owned by Trojan Helmet Limited.

No subdivision plan for the proposed zone has been developed as yet. However, a preliminary structure plan indicating a Landscape Amenity Management Area has been prepared and has been used to carry out the feasibility reporting and is included in Appendix 1.

We note that the assessment of the necessary development infrastructure provided below is limited to consideration of the scale of the development as it is currently proposed and excludes consideration of specific stages and the specific locations of future dwellings and infrastructure within the site.

3. Site Description

The site is located on 19.7 ha of land north east of the corner of Hogans Gully Road and Arrowtown – Lake Hayes Road. There is currently access to the site from Hogans Gully Road. There is existing QLDC infrastructure for water supply and wastewater located along Arrowtown – Lake Hayes Road and Hogans Gully Road adjacent to the site.

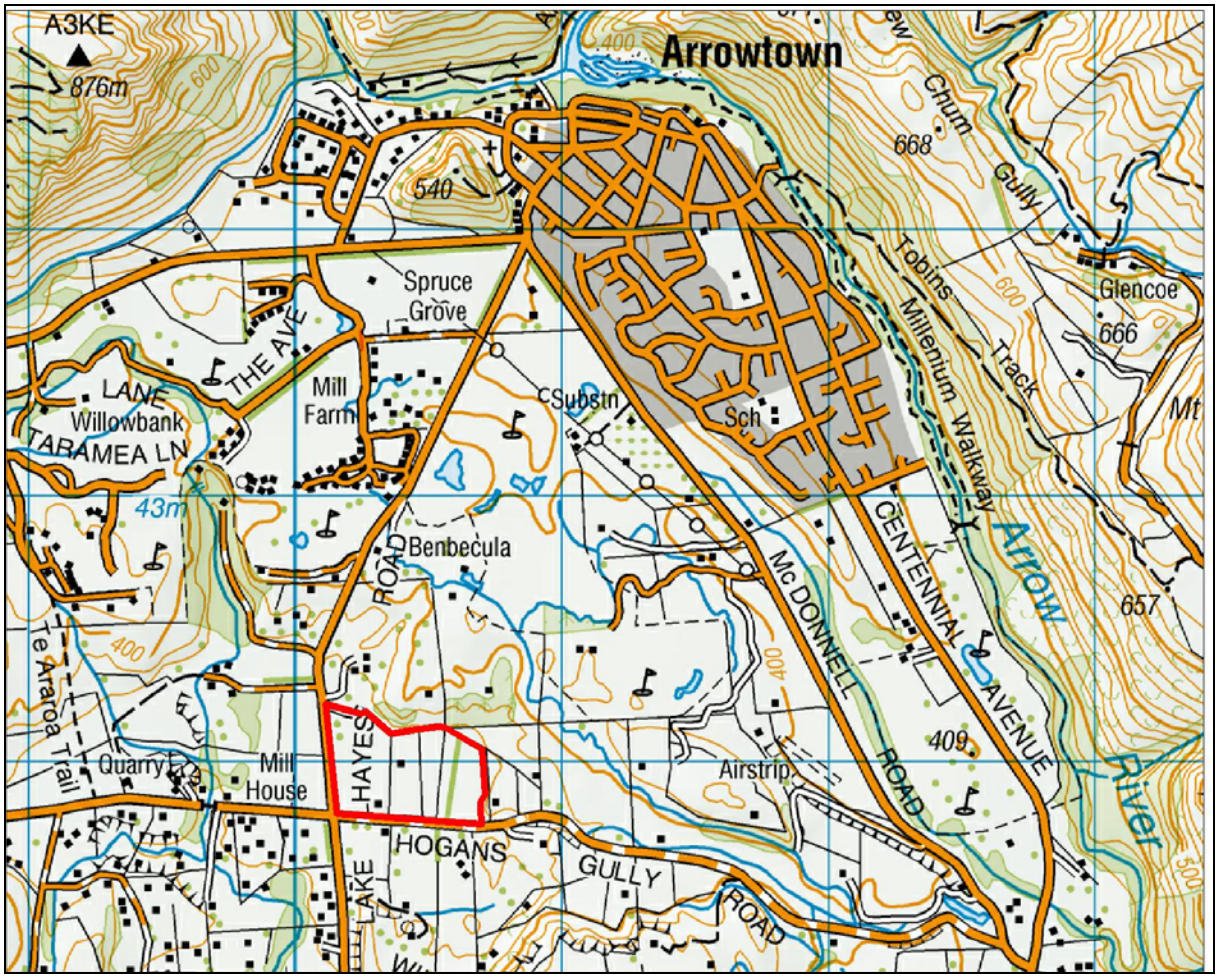


Figure 1 - Topographical Map Excerpt Showing Subject Site

The site comprises generally flat land. The overall topography of the site is gently falling to the south.

Based upon the published geological information (Institute of Geological and Nuclear Sciences (IGNS), 1:250,000 Geological Map 18, Geology of the Wakatipu) and geological examination carried out by others the underlying geological materials within the site are comprised of outwash gravels and till and morainic deposits. These soils overlie schist bedrock that is expected to exist at depth. There are alluvial deposits over the till.

The existing land use at the site is for pastoral grazing. Vegetation covering the area is grass.

Standing water in the form of a pond and drainage channel was observed on site. It is expected that ephemeral watercourses may be formed in some of the topographic depressions on site during periods of high precipitation although these are expected to be short lived and poorly defined.

The proposed development site and surrounding Arrowtown area experience generally cold winters with severe frosts at times and hot dry summers. Strong north-westerly winds are also a climatic characteristic of the area. The land receives approximately 850mm of rainfall per annum and may be subject to drought conditions during the summer months.

4. Water Supply

4.1 General

The site is located close to the QLDC water supply scheme for Lake Hayes with infrastructure for the water scheme being in the Arrowtown – Lake Hayes Road and Hogans Gully Road adjacent to the site. In addition, the existing buildings and dwellings on the neighbouring sites are currently serviced by existing on site water bore supplies. The Arrow Irrigation Company irrigation water race runs nearby the site and may be able to be reticulated to the site to provide future landscaping irrigation water demand.

4.2 Water Demand Assessment

Peak water demand would be expected during the summer months when seasonal populations are at their peak and irrigation usage will be at its highest. The following design figures have been adopted.

Demand Item	Potable Demand (litres/day)	No.	Total (litres/day)
Dwelling (average day)	2,100	10	21,000

The additional average daily water supply demand of 21 m^3 per day equates to 0.24 litres per second average flow over twenty four hours.

From the QLDC Land Development and Subdivision Code of Practice the peaking factors for either the Arrowtown or Lake Hayes water supply schemes are as follows:

Item	Peaking Factor
Average daily flow to peak daily flow	3.3
Average daily flow to peak hourly flow	6.6

Using the QLDC peaking factor, the peak hour flow is estimated at 1.6 litres per second.

4.3 Fire Fighting Demand

In accordance with *SNZ PAS 4509:2008 New Zealand Fire Service Firefighting Water Supplies Code of Practice,* the usage for the developed site is expected to fall into the *"Housing: includes single family dwellings, multi-unit dwellings but excludes multi storey apartment*

blocks" category. This will result in a fire fighting water supply classification of FW2. An FW2 classification requires 12.5 l/s of water flow available within a distance of 135 metres and an additional 12.5 l/s of water flow available within a distance of 270 metres.

Alternatively, in the absence of suitable flows and pressures to enable construction of fire hydrants, the future dwellings may be provided with a static firefighting reserve of 20,000 litres (fitted with appropriate fire service couplings) within 90 metres of any future dwelling.

4.4 Water Supply - Option 1

The first option to provide a water supply to the proposed zone, is to connect to an existing QLDC water supply scheme. Given the relative elevations and proximity to site, it would be most appropriate to connect to the Lake Hayes water supply scheme. Part of the site lies within the Lake Hayes Water Supply Scheme boundary.

No network modelling has been undertaken due to time constraints. However, it would appear that the relatively modest levels of flow required would be able to be accommodated. This would be by way of either a direct connection to the existing infrastructure or via some on site buffering to reduce the peak demands on the existing water supply scheme. If buffering was required, it is expected that booster pumping will be required to then reticulate water to the development areas around the site.

In order to connect to the QLDC Water Supply Scheme, approval of Council would be required to extend the water supply scheme boundary to include the proposed zone. In addition, Development Contributions would need to be paid for each dwelling connected. Council may include other conditions for extending the water supply scheme to include the proposed zone which may result in additional upgrade costs being borne by the developer. Early liaison with Council will be required in order to determine exact Council requirements and potential cost liabilities.

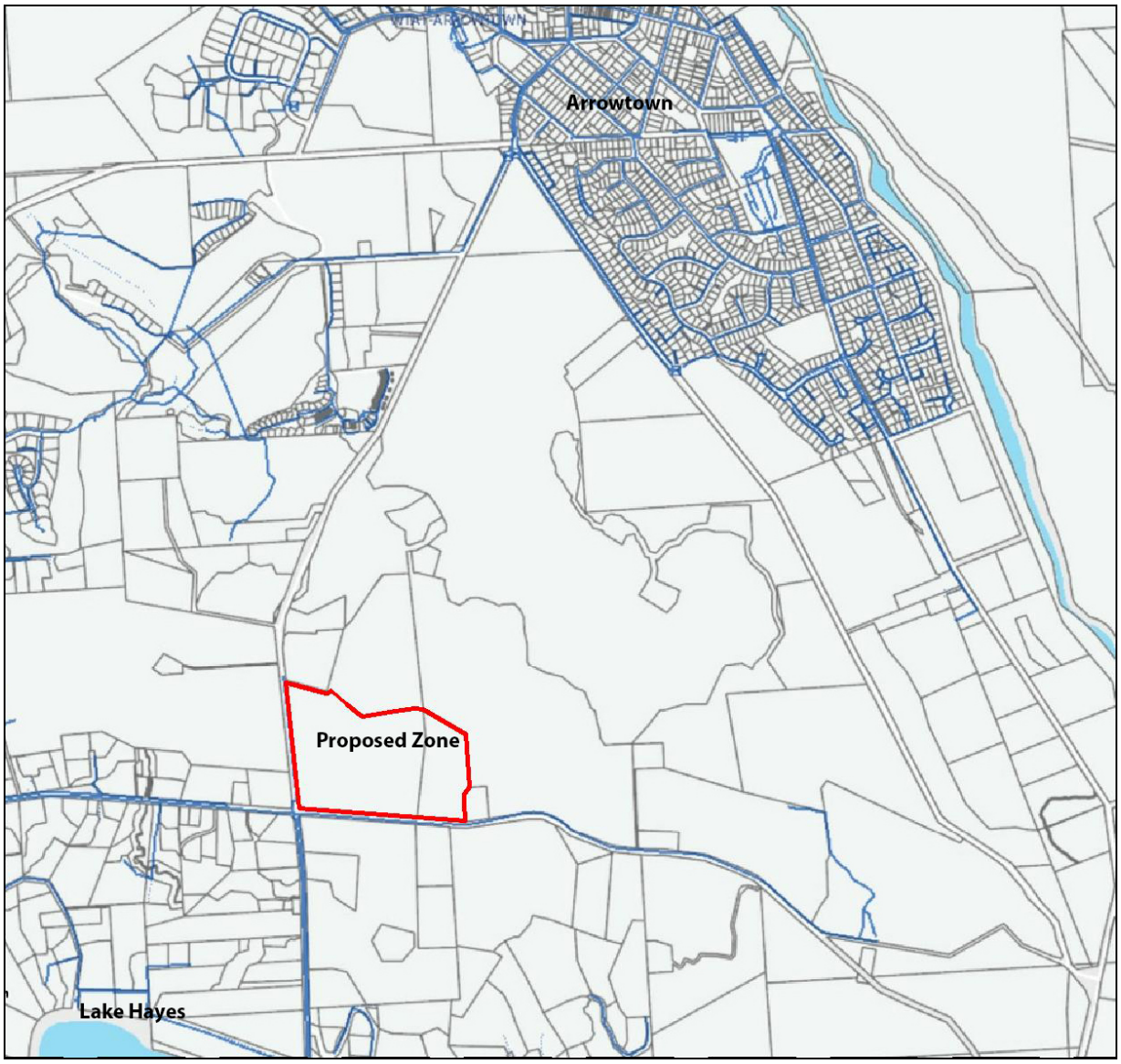


Figure 2 - Map Showing Existing QLDC Water Supply Infrastructure.

4.5 Water Supply - Option 2

The second option for providing a water supply for the development would be to use either a new water bore or an existing bore (or a combination of the two) to supply the proposed zone with potable water. This would mean that the zone would have a standalone water supply that was separate from any Council reticulation.

The basic components of such a system would include the water bore intakes and pumps, rising main and storage reservoir as well as a water treatment system sufficient to bring the supply in line with Drinking Standards for New Zealand 2005 (Revised 2008) (DWSNZ).

The water supply storage reservoir for the proposed zone would be relatively small as it would be a buffer only and would likely be accommodated within a 20,000 litre tank or similar. From this buffer storage, water would be supplied to the zone by a water pressure boosting pump station to provide domestic pressures. Each future allotment would provide their own firefighting reserve and associated couplings.

As well as the physical construction issues involved with this option a number of consenting and maintenance matters would also need to be addressed. A resource consent will be required to construct any new bore and a further consent may be required for the water take itself if either the calculated total daily demand or the peak hourly flow exceed the permitted water take rates set out in the Otago Regional Council's Regional Plan for Water. Land use and building consents may also be required for the reservoir and water treatment facilities.

There are existing productive bores on neighbouring sites. Two bores are currently used for servicing the associated golf course site with both potable and irrigation water. It is likely that these two bores would provide sufficient water for the potable demand for the proposed zone. However, this may reduce the amount of water available for irrigation of the associated golf course and landscaping and this would need to be assessed at the time development proceeded to ensure there was sufficient water for all purposes across the site.

The main issue to be considered with regards to this option would be the on-going maintenance and management of the water supply and treatment system. For a system of the expected size to service this site, the water supply could be owned by a lot owners association (or similar) responsible for the on-going management and maintenance of the infrastructure. A similar system to this has been used for various small private schemes around Queenstown.

4.6 Conclusions and Recommendations

Both of the two options outlined above to supply water to the subject site are feasible. Further investigation, consultation with Council and cost analysis will be necessary to establish the final methodology used.

5. Wastewater Disposal

5.1 General

A Council reticulated sewerage scheme exists adjacent to the site in Arrowtown – Lake Hayes Road. In addition, there is the possibility of constructing a standalone communal treatment and disposal system to cater for the wastewater drainage from the development of the proposed zone.

Both of these options are considered further below.

5.2 Demand Assessment

Peak wastewater generation is expected to coincide with peak water demand. The following design figures have been adopted:

Wastewater Generation Item	Wastewater Generation (litres/day)	No.	Total (litres/day)
Dwelling (average day)	1,050	10	10,500

The additional average daily wastewater generation of 10.5 m^3 per day equates to 0.12 litres per second average flow over twenty four hours.

From the QLDC amendments to NZS4404:2004 Land Development and Subdivision Engineering, the peaking factors for the wastewater network are as follows:

Item	Peaking Factor
Dry weather diurnal peak flow	2.5
Wet weather dilution/infiltration factor	2

Using the QLDC peaking factors, during the wet weather peak flow is estimated at 0.61 litres per second.

5.3 Wastewater Drainage – Option 1 – Council Reticulated Scheme

This option involves connecting to the existing Council reticulation in Arrowtown – Lake Hayes Road adjacent to the site.

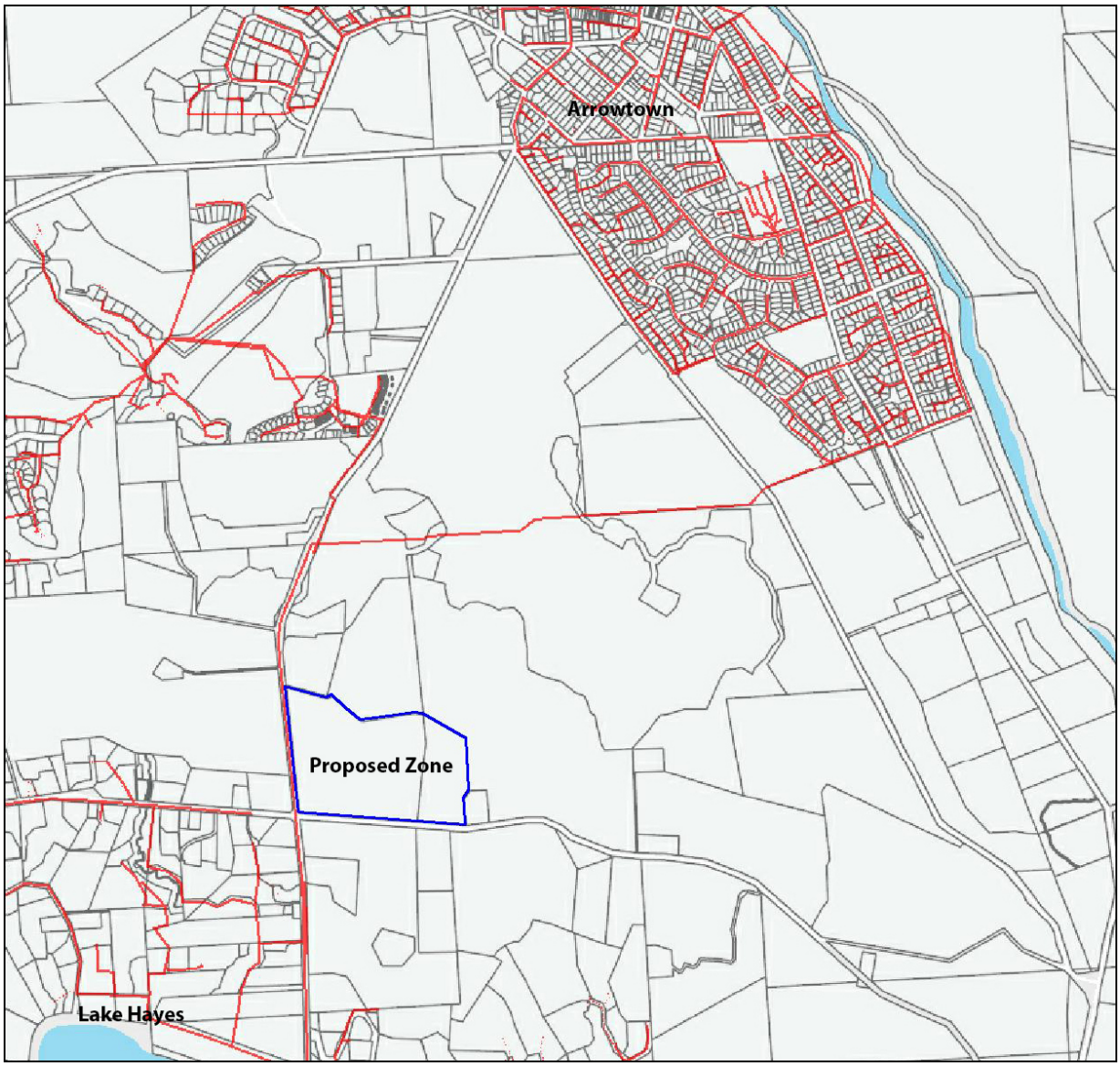


Figure 3 - Map Showing Existing QLDC Wastewater Drainage Infrastructure.

As previously stated, the site is generally flat. It is anticipated that much of the site will be able to be drained using standard trunk and lateral gravity pipelines. These will drain to a central pump station that will then pump to a suitable discharge point in the Council network.

The primary pump station would be able to be designed and constructed in such a fashion to enable buffering to reduce flows into the existing Council infrastructure at peak times.

In order to connect to the QLDC Wastewater Drainage Scheme, approval of Council would be required to extend the wastewater scheme boundary to include the proposed zone. In addition, Development Contributions would need to be paid for each dwelling connected.. Council may include other conditions for extending the wastewater scheme to include the

proposed zone that may result in additional upgrade costs being borne by the developer. Early liaison with Council will be required in order to determine exact Council requirements and potential cost liabilities.

5.4 Wastewater Drainage – Option 2 – Communal System

This option involves constructing a new communal wastewater treatment and disposal system at a suitable location on site and treating all wastewater flows from the proposed development prior to discharge to land.

It is envisaged that a package plant system similar to that used at Jacks Point could be accommodated to service the site. The system would involve the primary treatment of wastewater at each individual dwelling by way of a septic tank to remove solids. Primary treated effluent from each septic tank is then pumped or drained to the communal package treatment facility where it undergoes secondary and possibly tertiary treatment prior to disposal to land.

This type of system has a number of positive attributes including:

- The ability to stage expansion of the treatment plant to cater for staged development of the zone.
- No pond based treatment.
- Possible reuse of water for irrigation purposes.

The system would be made up of the following components:

1. Each dwelling would drain wastewater flows to a septic tank located close by. This septic tank would be installed at the time the dwelling was constructed. Depending on the location and topography, the tank would be fitted with a pump and rising main to reticulate flows to gravity reticulation or would simply connect via gravity to nearby reticulation. The septic tanks will require routine inspections and maintenance. This will mostly involve pumping out the solid wastes from time to time. The inspections and maintenance would be managed by a lot owners association or similar.
2. It is likely that a mix of gravity and pumped mains will reticulate flows to a suitably located treatment facility. In the case of pumped mains, individual tanks would connect to this via a non-return valve kit.
3. At this stage, a package treatment plant is anticipated to be located near the existing service area. This will receive all wastewater flows into a buffer tank and then treat it using a proprietary treatment system. This system would be a package treatment plant

from a proprietary manufacturer/supplier. The actual process adopted will be the subject of detailed design and procurement evaluation. For some guidance, the system used at Jacks Point involves the use of textile packed bed reactors. If deemed necessary at the time of detailed design, tertiary treatment such as UV disinfection could be included to further treat the effluent.

4. The final treated effluent would be reticulated to a suitable disposal location. If suitable tertiary treatment is included, it is likely that this treated effluent could be used for shallow subsurface irrigation around the site. This would need to be carefully considered at the time of detailed design to ensure freezing pipes and public access were appropriately managed.

As well as the physical construction issues involved with this option a number of consenting and maintenance matters would also need to be addressed. A resource consent will be required to dispose effluent to ground as the flows are likely to exceed the permitted effluent disposal rates set out in the Otago Regional Council's Regional Plan for Water. Land use and building consents may also be required for the wastewater treatment facilities.

Similar to the water supply system, one of the main issues to be considered with regards to this option would be the on-going maintenance and management of the wastewater treatment and disposal system. One option would see the system vested with Council. Alternatively, the wastewater drainage and treatment system could be owned by a lot owners association (or similar) responsible for the on-going management and maintenance of the infrastructure. A similar approach to this has been adopted at Jacks Point near Queenstown and accepted by QLDC.

5.5 Conclusions and Recommendations

It is recommended that the wastewater generated from the proposed development be disposed of by way of connection to either the QLDC reticulated scheme or a new purpose built communal treatment and disposal facility on site. The feasibility of the chosen wastewater option will need further detailed analysis, consultation and consenting prior to implementation.

6. Stormwater Disposal

6.1 General

Generally, it is proposed to maintain the runoff characteristics of the existing catchment. However the proposed development on the site will alter the existing stormwater run off patterns and will serve to increase the peak flow runoff. We recommend to collect and control the stormwater runoff and dispose via connection to local water courses or to dispose of on site using stormwater infiltration and soakage features.

6.2 Planning Rules and Regulations

Rule 12.5.1.1 of the Regional Plan: Water for Otago states that the discharge of drainage water to water (or onto land where it might enter water) from any drain is a permitted activity so long as certain conditions are met. The conditions of particular relevance to the discharge of stormwater from the proposed new roads and domestic allotments are as follows:

> *12.5.1.1 (b) The discharge, after reasonable mixing, does not give rise to all or any of the following effects in the receiving water:*
>
> *(i) The production of any 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*
>
> *…*
>
> *(v) Any significant adverse effects on aquatic life.*

It is further stated that:

> *The discharge of drainage water under Rule 12.5.1.1 will have no more than minor adverse effects on the natural and human use values supported by water bodies, or on any other person. This rule is adopted to enable drainage water to be discharged while providing protection for those values and the interests of those people. Any other activity involving the discharge of drainage water is a restricted discretionary activity in order that any adverse effects can be assessed.*

Contaminants associated with vehicular traffic can include oils, rubber, heavy metals and sediments. In large amounts these contaminants can greatly decrease the natural and human use values of bodies of water. As the stormwater from the site will likely be discharging either directly into local water courses or to ground, appropriate protections will need to be installed in the on-site drainage system in order to remove such contaminants

from the stormwater. The aim of stormwater quality treatment used at the site would be to ensure that the runoff from the new development is in a similar condition to that being achieved before the development. Of particular concern are the “first flush” flows that carry the highest pollutant loadings.

Appropriate technologies to separate contaminants from the stormwater flows might include the use of mud-tanks located in the on-site drainage sumps and a vortex separator mechanism such as a Hynds Downstream Defender which provide high removal efficiencies of suspended solids and floatables over a wide range of flow rates.

Careful design of the stormwater reticulation for the site will ensure that the requirements set out in the Regional Plan: Water for Otago are met.

6.3 Stormwater Quantities

At this early stage in the development of the proposed zone, it is difficult to determine the increase in storm water runoff from the site. Initial calculations have been undertaken and these indicate that for a 10 minute rain event with an average reoccurrence interval (ARI) of 10 years the development is expected to increase the storm water flow rate by approximately 500 litres per second. This will vary depending upon the density of the development and the permeability of the site.

This level of increase in runoff would result in very large infrastructure if the traditional approach of reticulating all the flows from the site was adopted. If a single point of discharge was developed, the required outlet pipe would be approximately 525 mm in diameter. This level of infrastructure would be expensive and can be mitigated using a Low Impact Design (LID) approach.

From NZS4404:2010 Land Development and Infrastructure:

> *Low impact design aims to use natural processes such as vegetation and soil media to provide stormwater management solutions as well as adding value to urban environments. The main principles of low impact design are reducing stormwater generation by reducing impervious areas, minimising site disturbance, and avoiding discharge of contaminants. Stormwater should be managed as close to the point of origin as possible to minimise collection and conveyance. Benefits include limiting discharges of silt, suspended solids, and other pollutants into receiving waters, and protecting and enhancing natural waterways.*

And:

> *Low impact design is a type of storm water system that aims to minimise environmental impacts by:*

(a) Reducing peak flow discharges by attenuation;

(b) Eliminating or reducing discharges by infiltration or soakage;

(c) Improving water quality by filtration;

(d) Installing detention devices for beneficial reuse.

The types of low impact devices and practices that could be included in the zone include the following:

- Detention Ponds;
- Vegetated swales;
- Rain gardens;
- Rainwater tanks;
- Soakage pits and soak holes;
- Filter strips; and
- Infiltration trenches/basins.

Subdivision urban design principles may also assist in mitigating runoff from the site. These include clustering development to increase open area around developed areas and decreasing road setbacks in order to decrease the likely impervious areas.

In addition to reducing the peak discharge from the site, LID approaches may also improve the quality of the runoff from the site.

6.4 Conclusions and Recommendations

We consider that the collection and subsequent disposal of stormwater from the proposed development is entirely feasible via collecting and controlling the stormwater runoff and disposing by draining to the local water courses passing the site.

Dependent upon the overall design approach for the subdivision, the storm water runoff leaving the site could be greatly reduced by the introduction of low impact design approaches including the use of attenuation and filtration devices.

7. Natural Hazards

Natural Hazards have been separately assessed by HCL as part of a global Natural Hazards Assessment for THL land holdings.

The HCL Natural Hazards Assessment report is included as Appendix 2 and confirms there are no natural hazard constraints applying to the Rural Lifestyle Area A Land.

8. Conclusions and Recommendations

The subject site and the proposed development have been assessed to determine the suitability for development in relation to infrastructure services. No significant constraints have been identified and the Rural Lifestyle A land is suitable for the proposed development from an infrastructure servicing viewpoint.

The key findings are summarised as follows;

i. There are two options for supplying water to the site. The first option would be to utilise the QLDC reticulated water supply. The second option would be to install a new, private water bore intake and treatment along with a new reservoir and a water supply boosting pump station. The final decision on which methodology to use will be decided at a later point following further investigation, consultation and cost analysis.

ii. Wastewater drainage reticulation from the site will be able to be catered for with either connection to the existing QLDC reticulation or construction of a proposed wastewater reticulation and treatment and disposal system. The majority of the site will be able to be reticulated by the construction of gravity sewer pipes. However, it is anticipated that parts of the development site will require pump stations in order to convey flows to either the existing QLDC infrastructure or the new treatment plant.

iii. Stormwater runoff from the site can be satisfactorily disposed of by the construction of necessary reticulation with disposal to local water courses. It is recommended that in order to reduce the peak runoff and to improve runoff quality, low impact design approaches are adopted.

iv. Based on the global Natural Hazard Assessment prepared by HCL, no natural hazard issues exist which constrain development on the Rural Lifestyle A land.

Overall, we confirm that there are no significant impediments to development of the site with respect to Infrastructure Services or Natural Hazard.

We recommend that the timing and scale of the proposed infrastructure upgrades be further assessed once the layout of the proposed zone has been further progressed and staging of development has been confirmed.

Appendix 1

Site Plan

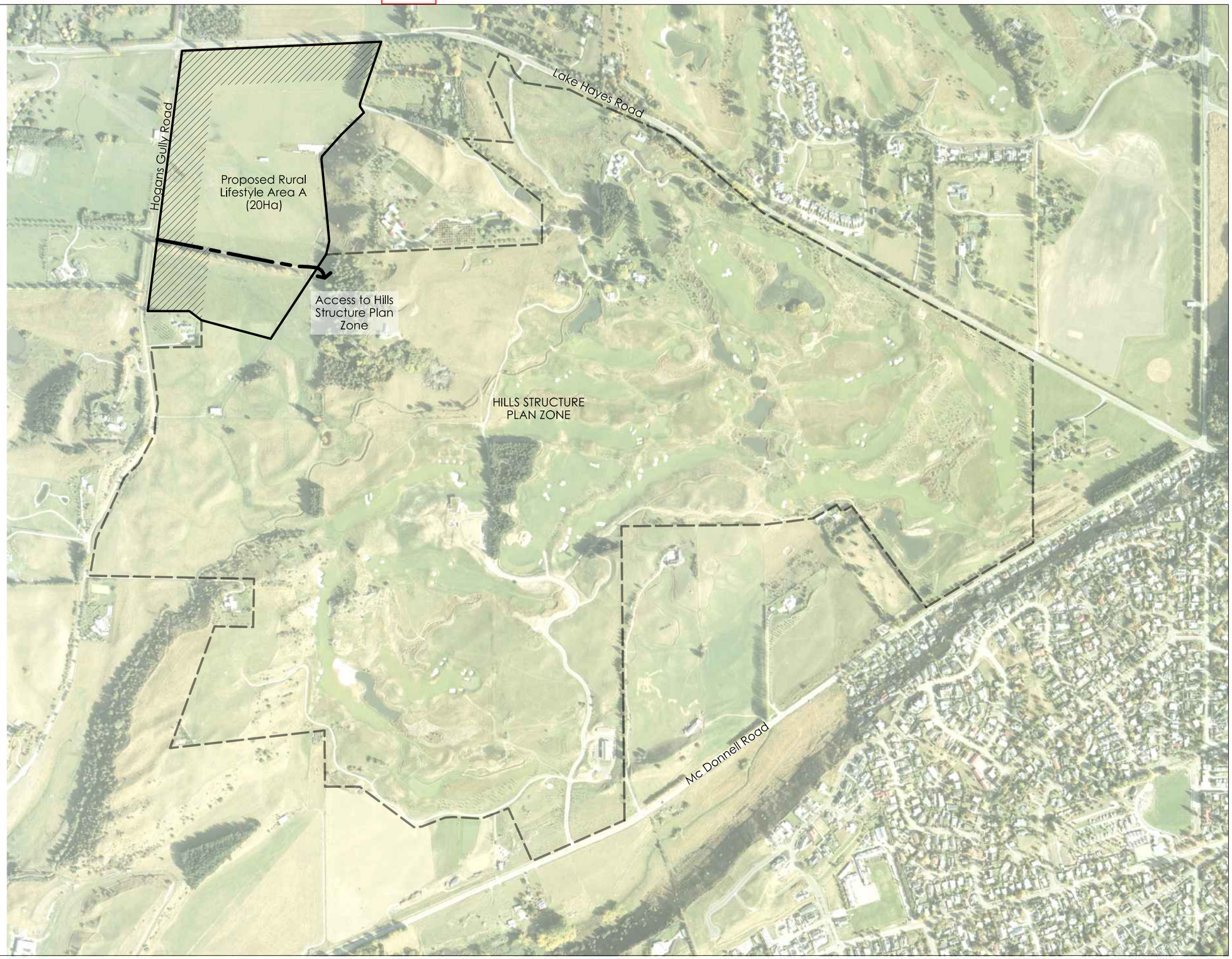
KEY:

Hills Structure Plan Boundary

Proposed zoning Areas

Overlays:

Landscape Amenity Management Area:
Includes tree planting, sited to preserve views of surrounding landscape and partially screen proposed dwellings



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SCALE: 1:4,000 (A1); 1:8,000 (A3)

0 100 200 300

PLAN STATUS:

DP REVIEW

THE HILLS
PROPOSED RURAL LIFESTYLE AREA A

DRAWN / REVIEWED: RT / JC
APPROVED: DT
DATE: 14.10.15

DRAWING NO:
MH_10_1_MLP_012B

Appendix 2

HCL Natural Hazards Assessment Report

452

hadley consultants LTD

CONSULTING ENGINEERS STRUCTURAL / CIVIL / PROJECT MANAGEMENT / GEOTECHNICAL

Trojan Helmet Ltd

Hills Golf Course (including McDonnell Road Land) and Hogans Gully Road Land

Proposed District Plan Submission

Natural Hazard Assessment

hadley consultants LTD
CONSULTING ENGINEERS STRUCTURAL / CIVIL / PROJECT MANAGEMENT / GEOTECHNICAL

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Document Status

Revision	Author:		Reviewer:		
	Name	Signature	Name	Signature	Date
A (Initial Issue)	J. Hadley		J. McCartney		20 October 2015
B (For Submission)	J. Hadley		J. McCartney		21 October 2015
C (Final)	J. Hadley		J. McCartney		22 October 2015

Limitations

This report has been written for the particular brief to HCL from their client and no responsibility is accepted for the use of the report for any other purpose, or in any other context or by any third party without prior review and agreement.

In addition, this report contains information and recommendations based on information obtained by inspection, sampling or testing at specific times and locations with limited site coverage as outlined in this report. This report does not purport to completely describe all site characteristics and properties and it must be appreciated that the actual conditions encountered throughout the site may vary, particularly where ground conditions and continuity have been inferred between test locations. If conditions at the site are subsequently found to differ significantly from those described and/or anticipated in this report, HCL must be notified to advise and provide further interpretation.

Contents

1. Introduction

Trojan Helmet Ltd (THL) has engaged Hadley Consultants Limited (HCL) to conduct a natural hazards assessment of their land which comprises both the Hills Golf Course and an adjacent land holding which fronts Hogans Gully Road.

This report considers the relevant site conditions and natural hazard issues affecting the potential building development within possible development areas identified by others. Specifically, the natural hazard elements investigated and assessed are:

- Liquefaction hazard,
- Alluvial fan hazard, and
- Inundation and flood risk.

The purpose of this report is to provide a reference document to assess whether any natural hazard constraints exist in a global context which will adversely impact proposed development areas on the THL land holdings.

This report is intended to inform submissions made by THL on the Queenstown Lakes District Council's (QLDC) Proposed District Plan.

2. Nature of Proposed Development

The development proposed across the THL land comprises new zoned Rural Lifestyle Areas combined with a new Resort Zoning (the Hills Resort Zone) in which specific pockets of building development are identified for activities which include discrete Homesites, Visitor Accommodation, Farm and Resort Services and Staff Accommodation.

There are two primary Proposed Rural Lifestyle zones as follows;

- Proposed Rural Lifestyle Area A comprising a 19.7Ha block bounded by Hogans Gully Road to the south and Arrowtown – Lake Hayes Road to the west; and
- Proposed Rural Lifestyle Area B comprising an 8.4Ha block with frontage to McDonnell Road.

The remainder of the proposed development areas are located wholly within the existing Golf Course area (which will form the new Hills Resort Zone) and represent discrete pockets of development across the site.

The overall development sites and areas are indicated on the Darby Partners and HCL topographic drawings contained in Appendix A.

Some of the proposed development areas within the Golf Course site include building platforms previously consented under RM081223. Where relevant, previous work on these platforms has been considered in this more global evaluation of natural hazards impacting the land holding.

3. Scope of Assessment

The purpose of this report is to provide a global overview of the natural hazard issues which might affect development capability across the THL land holdings. In making this assessment, HCL have undertaken the following activities;

- Stereo pair photo analysis of geological features to identify potential areas of instability.
- Review of previous site investigation and assessment work by others for previous developments at the THL site. These investigations have been used to verify the HCL developed geological and geotechnical models adopted when assessing hazard.
- Detailed site walkover and geological mapping of all proposed development areas.
- Logging and mapping of open excavations and test pits across the site to confirm site lithologies.
- Review and consideration of QLDC Hazard Maps and their impact and relevance to the THL site following specific evaluation and verification of the geomorphology which exists.

It is intended that this document form a master Natural Hazards document for the THL land holdings which may be referred to when considering discrete planning submissions for the separate Rural Lifestyle A and B areas, and the other Activity Areas within the proposed Hills Resort Zone.

4. Site Description

The proposed development takes in the Hills Golf Course Land, located at 164 McDonnell Road approximately 1km south of Arrowtown and an area of land comprising 19.7Ha to the south of the Golf Course. This land, referred to as the Hogans Gully Land, is bounded by Hogans Gully Road to the south and Arrowtown – Lake Hayes Road to the west. The drawings included in Appendix A illustrate the site location and development areas.

The Golf Course is accessed from McDonnell Road which runs along the eastern boundary of the site and the Hogans Gully Land is accessed from Hogans Gully Road which runs along the southern site boundary.

Prior to the development of the golf course the THL land comprised farmland. The existing vegetative cover comprises a combination of long pasture, golf course green, landscaped areas and wooded areas. Vegetative cover on the Hogans Gully Land currently comprises farmland, paddocks and pasture.

The site includes several existing structures and these existing building sites have not been assessed as it is assumed they have been considered in detail as part of previous assessment work which allowed their construction.

Topographic contours of the site are shown on HCL Drawings 152859-S01 and S02 in Appendix A.

The site is undulating and ground levels typically vary between RL350m to RL430m. Slopes on the site are predominately gentle (5 to 15º); however, localised steep slopes are also present in some areas across the site.

Rock exposures also exist across the site, most notably on the Golf Course Land but also on the south facing flanks above the Hogans Gully Land.

There are a number of springs, gullies and manmade drainage features present across the site which will give rise to emphemeral flows during wet periods. The most significant drainage features include a stream which runs along the southern boundary of the THL land roughly parallel with Hogans Gully Road and an internal water race system which traverses the higher elevation Golf Course Land roughly west to east.

The site is primarily accessed from McDonnell Road, although additional farm track access is possible from Hogans Gully Road and from Arrowtown – Lake Hayes Road for existing private residences.

The site also includes a relatively complex system of internal roads, footpaths, cart paths and farm tracks that will impact local catchment boundaries and run off characteristics.

The land receives approximately 850mm of rainfall per annum and may be subject to drought conditions during the summer months.

5. QLDC Hazard Register and Previous Work

QLDC Hazard Maps (refer Appendix B) note that the site may be affected by;

- Liquefaction Hazard, assessed as provisionally LIC1.
- Alluvial Fan Hazard.

The liquefaction risk classification is shown to affect the majority of the Golf Course Land, whilst the Alluvial Fan Hazard is limited in its extent, taking in parts of the south facing slopes above the Hogans Gully Land.

In August 2006, Tonkin and Taylor Ltd (T&T) conducted a detailed investigation of the Golf Course area as part of a previous development proposal. This work by T&T included;

- Site evaluation,
- The excavation and logging of 12 test pits ranging in depth from 1.8m to 4.8m,
- Scala Penetrometer testing.

As part of their reporting T&T also provided soil parameters for foundation design and slope stability analysis.

T&T recorded that there was no evidence of slope instability recorded in the vicinity of the proposed building platforms, although some instability was observed in the oversteepened slopes above the Hogans Gully Land.

With regard to liquefaction, T&T noted that;

i) Subgrade materials were expected to provide good bearing for shallow foundations.
ii) Settlement of the subgrade materials under seismic loading is expected to be minimal.
iii) For detailed design in accordance with NZS 1170.5:2004, subsoil Class C conditions could be assumed.
iv) The regional groundwater table was not encountered and is expected to lie at a depth several metres below existing ground surface across the site.

Overall the T&T work did not identify any natural hazard issues (such as liquefaction) affecting any of the proposed Golf Course sites and concluded that building foundations were expected to be founded on glacial outwash and glacial sediment which should provide good bearing.

6. Geological Setting

6.1 Physiography

The site is located within the Wakatipu Basin, a feature formed by a series of glacial advances.

The most recent glacial advance occurred in the area between 10,000 and 20,000 years ago. This glacial activity has deposited glacial till, outwash and lake sediments over scoured bedrock.

Post glacial times were then dominated by erosion and deposition of alluvial gravels by local watercourses and river systems and during periods of high lake levels. This is relevant in the context of the Hogans Gully Land, where Shotover River derived alluvium is identified.

6.2 Site Lithologies

The predominant site lithologies across the site may be summarised as follows;

i) **Schist.** Schist outcrops irregularly, and is particularly evident beneath the higher terrain towards the south above the Hogans Gully Land. No particular distress was observed (eg glacial shearing/plucking), nor was there any evidence of mass movement.

ii) **Glacial Till.** Glacial Till dominates across the Golf Course Land, and is particularly notable by the presence of the hummocky terrain. Where visible in outcrop and suboutcrop, it is a lodgement till, comprising compact silt/sand, with subordinate gravel clasts, and generally rare cobbles with rare boulders.

There appear to be three different ages of tills, the oldest being a capping on schist in the vicinity of Sites HS1 and HS8, intermediate age tills form the hummocky terrain within the Golf Course proper, while the youngest till has intruded into the Hogans Gully Land. The latter is finer than the older type, but there isn't a marked difference in grading. Additional observations include;

- No mass movement noted in the till,
- Possible historic fill mounds sometimes hard to differentiate from insitu till.

iii) **River Alluvium.** The presence of river alluvium is defined in different areas of the site as follows;

- **Within Proposed Rural Lifestyle Area A:** This area is assessed as Shotover derived alluvium sourced from the west. Of particular note are the finger-like beach deposits which accumulated at the surface of the river alluvium by long shore drift when the lake was high.
- **Within Proposed Rural Lifestyle Area B:** Observations in a test pit near the western margin of this zone disclosed a well-bedded, river alluvium comprising well-graded sandy gravel to cobbly sandy gravel. Clasts appear to be Shotover sourced, hence it is likely that the sediments were deposited by a former Hayes Creek draining the basin south of Coronet Peak. Degradation has produced a stepped morphology, grading gently down towards McDonnell Road.

iv) **Fans.** Small fans do grade out into the Proposed Rural Lifestyle Area A, but they do not appear to be active. A small, intra-course fan is present near Site A6 and there may be other fan elements around the site and away from proposed development areas. Due to their lack of activity these fan areas require consideration in any detailed design, but are not considered a high risk hazard.

7. Specific Development Area Assessment

7.1 General

Consideration of the Development Area as a whole has been separated as follows;

i) Proposed Rural Lifestyle Area A,
ii) Proposed Rural Lifestyle Area B,
iii) Development Sites designated “HS” and “A” across the Golf Course area.

We note that due to the presence of existing structures the following sites were excluded from evaluation by HCL;

- Site S – the Resort Services Area,
- Site C – the Clubhouse,
- HS6 – An existing house site,
- HS7 – Existing loge.

We confirm that all other development areas indicated on the Darby Partners drawings contained in Appendix A have been assessed. To avoid repetition in reporting, we have grouped sites with common features.

7.2 Liquefaction Risk and Flood Hazard

We collectively address the Liquefaction Risk noted by QLDC as affecting Proposed Rural Lifestyle Area B and all of the HS and A development areas within the Golf Course Land.

HCL’s assessment of the site lithologies is that the Golf Course Land is mantled by glacial till comprising compact sands and gravels with a regional groundwater level located at depth. Schist bedrock outcrops in several locations and neither the compact till or the bedrock are susceptible to liquefaction. Further, Proposed Rural Lifestyle Area B includes alluvial deposits, again with a significant depth of groundwater.

HCL’s assessment is also verified by the previous reporting and site investigation work of T&T.

The confirmed presence of compact glacial tills and the absence of shallow groundwater allow us to confirm that liquefaction hazard is not a relevant risk for any of the proposed development areas.

A flood hazard is not recorded by QLDC and we confirm that subject to normal cut off drainage and catchment management, no large scale flood or inundation risk exists.

7.3 Proposed Rural Lifestyle Area A

Observations relevant to this area include;

- Greater than 50% of the proposed site is located on flat to gently sloping terrain comprising Shotover-derived alluvium.
- Some inactive fan elements encroach into the development area from the north and northeast mantling both glacial till and alluvial deposits in these areas. This is depicted in Figure 2 contained in Appendix C.
- Streams associated with the fan elements are small and assessed as ephemeral with minor source catchments.
- Former high level Lake Wakatipu storm benches are identifiable features in the central reaches of the site and are well drained.
- Based on field inspection and the small size of the streams and source catchments, we do not believe the QLDC classification of the fan elements as active and debris dominated to be correct.

In summary, we believe that the alluvial fan hazard risks associated with this development area are very low subject to;

a) Provision of normal cut off drainage measures to control upslope runoff from ephemeral watercourses.
b) Further test pitting as part of any resource consent application to confirm the age and activity of the fan deposition.

7.4 Proposed Rural Lifestyle Area B

The following observations were made with respect to Proposed Rural Lifestyle Area B;

- The area contains alluvial deposits and consists of low relief with terraces degrading to the east.
- The exposed cut in the western edge of the development area shows Shotover-derived alluvium circa 23,000 years old comprising sandy gravels.
- The lithology is consistent across the site with the depth to groundwater likely to exceed 10m.

In summary, and noting our earlier comment under Section 7.2 with regard to liquefaction and flood risk, we again believe that the natural hazard risks associated with this development area are very low.

7.5 Sites Requiring Little or No Mitigation

The following sites have been assessed and grouped as relatively benign with minimal mitigation required for building development. These sites are;

- A1,
- A2,
- A3,
- A4,
- A5,
- A9,
- HS1,
- HS5, and
- HS8.

Other than the southern extent of A4 where a small depression exists, all of these sites are well drained with competent subgrade conditions. The sites are considered very low risk with regard to natural hazard where normal building controls around verification of bearing capacities for foundation design along with the provision of positive surface drainage control will allow development of these sites.

7.6 Site A8

Site A8 at the northern end of the Golf Course Land occupies a low relief mound on the north east side of the low relief pond.

Concern exists that the building or development area could include uncertified fill as part of pond construction. The relative heights of the pond water level (controlled by its outlet) and likely subgrade levels for foundations increases the risk of saturated subgrade conditions.

The site is not subject to natural hazard, but should be the subject of a specific geotechnical investigation to confirm the presence or otherwise of uncertified fill prior to the construction of any building.

7.7 Site A6

This site occupies a low relief localised fan which grades out from the hummocky till zone to the west. The site is located slightly above the creek level, suggesting a perched water table may be present in this area.

Some surface water control from the catchment to the west is required.

Again, the site is not subject to any natural hazard issues, but prior to construction of buildings the site should be subject to a specific geotechnical investigation to confirm the nature and extent of any fan materials and presence or otherwise of a perched water table which may require draining.

7.8 Site A10

This site takes in a substantial area of saturated ground in a through-drainage depression heading south. There are also overland flow issues to be resolved from the steep terrain catchment to the east.

The site could be developed subject to specifically designed drainage and ground improvement works involving cut to waste, installation of piped stormwater reticulation including resolution of secondary overflow issues and import to fill to achieve positive drainage to the area and to provide suitable foundation conditions.

7.9 Site A7

This site is currently constrained by existing services due to the presence of a pump shed, transformer and inspection panels.

There is also localised uncertainty regarding lithologies with the possible presence of fill due to the services modifications.

There are no natural hazard issues affecting the site, however we recommend a detailed geotechnical investigation to define fill areas prior to any building construction occurring.

7.10 Site HS10

This site is affected by water race leakage concentrating in the slope comprising the house site area.

Prior to building development at this site it will be necessary to;

- Complete subsurface investigations to confirm the impact of the race leakage on overall slope stability.
- Pipe the water race for long term security of the site and provide for some form of diversion away from buildings in the event of a catastrophic pipe rupture.

7.11 Site HS9

This site is located in a localised depression and it will be necessary to resolve drainage to the south to avoid a ponding risk.

Similar to HS10, it will be necessary to;

- Complete subsurface investigations to confirm the depth to competent bearing materials (till) in the base of the depression due to likely thick colluvium/soil layer accumulation in the natural basin.
- Pipe the water race for long term security of the site and provide for some form of diversion away from buildings in the event of a catastrophic pipe rupture in the race.

7.12 Sites HS2, HS3 and HS4

These three sites are all located in the valley lines of ephemeral drainage systems. Consequently they are presently wet and saturated. Figure 10 included in Appendix D illustrates the location of the sites and how the channel and ephemeral gully systems affect each area.

It will be possible to develop Sites HS2, HS3 and HS4 if drainage, diversion and ground improvement work is completed, but we recommend that at the time detailed house designs are proposed, consideration is given to locating construction to higher relief ground within the respective Housesite areas. This will minimize the diversion and drainage works required.

All of HS2, HS3 and HS4 are subject to risk from a failure in the water race. Again, piping of the race and consideration of diversions in the event of a breach are recommended to mitigate this risk.

8. Conclusions and Recommendations

Based on our site evaluation and assessment work we have made the following conclusions with regard to Natural Hazards and how they impact the THL Golf Course Land (encompassing the proposed Hills Resort Zone and proposed Rural Lifestyle Area B Zone) and Hogans Gully Land (encompassing the proposed Rural Lifestyle Are A Zone);

Natural Hazard Risks

i) The Golf Course Land, including Proposed Rural Lifestyle Area B where alluvial deposits are identified, comprises competent and compact glacial till underlain by near surface schist bedrock. These materials are not susceptible to liquefaction and the risk of liquefaction is further reduced by low regional groundwater levels.

ii) Based on our assessment and investigation of the Golf Course Land, the provisional classification of the site as an LIC1 liquefaction risk by QLDC is not valid. The risk of liquefaction impacting the site is assessed as very low and liquefaction does not constrain the site as a natural hazard.

iii) The Proposed Rural Lifestyle Area A (Hogans Gully) Land comprises predominately alluvial material where the northern section of the Proposed Rural Lifestyle Area A may potentially be impacted by an alluvial fan hazard. Based on our assessment we don't believe the fan area is active and in the event it was active, its extent would be significantly reduced from that indicated by QLDC Hazard Maps. We have assessed any risk from alluvial fan hazard as low, recognising that if further investigation confirms activity, the risk can be mitigated through bunding protection and regrading at the time of resource consent.

iv) None of the land areas or development areas are subject to regional flood or inundation hazard.

Specific Development Site Controls

v) Prior to any building construction occurring we recommend that sites A6, A7 and A8 require specific geotechnical investigation and design of foundations by a Chartered Professional Engineer. This investigation shall include rationalisation of cut off drainage to improve subgrade conditions and to address overland flow paths.

vi) Sites HS9 and HS10 are impacted by the existing water race and potential leakage from this race. Prior to any building construction occurring we recommend that a specific geotechnical investigation be completed by a Chartered Professional Engineer to confirm the extent of potential soil accumulation in the depression on HS9 and slope stability impacts of the water race on HS10. Both sites will require piping of the water race and diversion design in the event of a catastrophic pipe breach.

vii) Development sites A10, HS2, HS3 and HS4 are more complex sites as a result of being sited across some natural drainage paths. The sites are not subject to large scale natural hazard risk, but to develop them will require specific design of works to cut off and divert existing flow paths to prevent site inundation, and to address hazards associated with the water race to the north. To ensure that these site development issues are properly addressed, we recommend that prior to any building construction occurring, specific engineering design of drainage and ground improvement works be completed by a Chartered Professional Engineer. We recommend consideration be given to refining the location of these development sites so that they take in higher ground within their respective activity areas, removed from natural drainage paths.

Appendix A

Darby Partners and HCL

Topographic Drawings

KEY:

Structure Plan Boundary

Activity Area

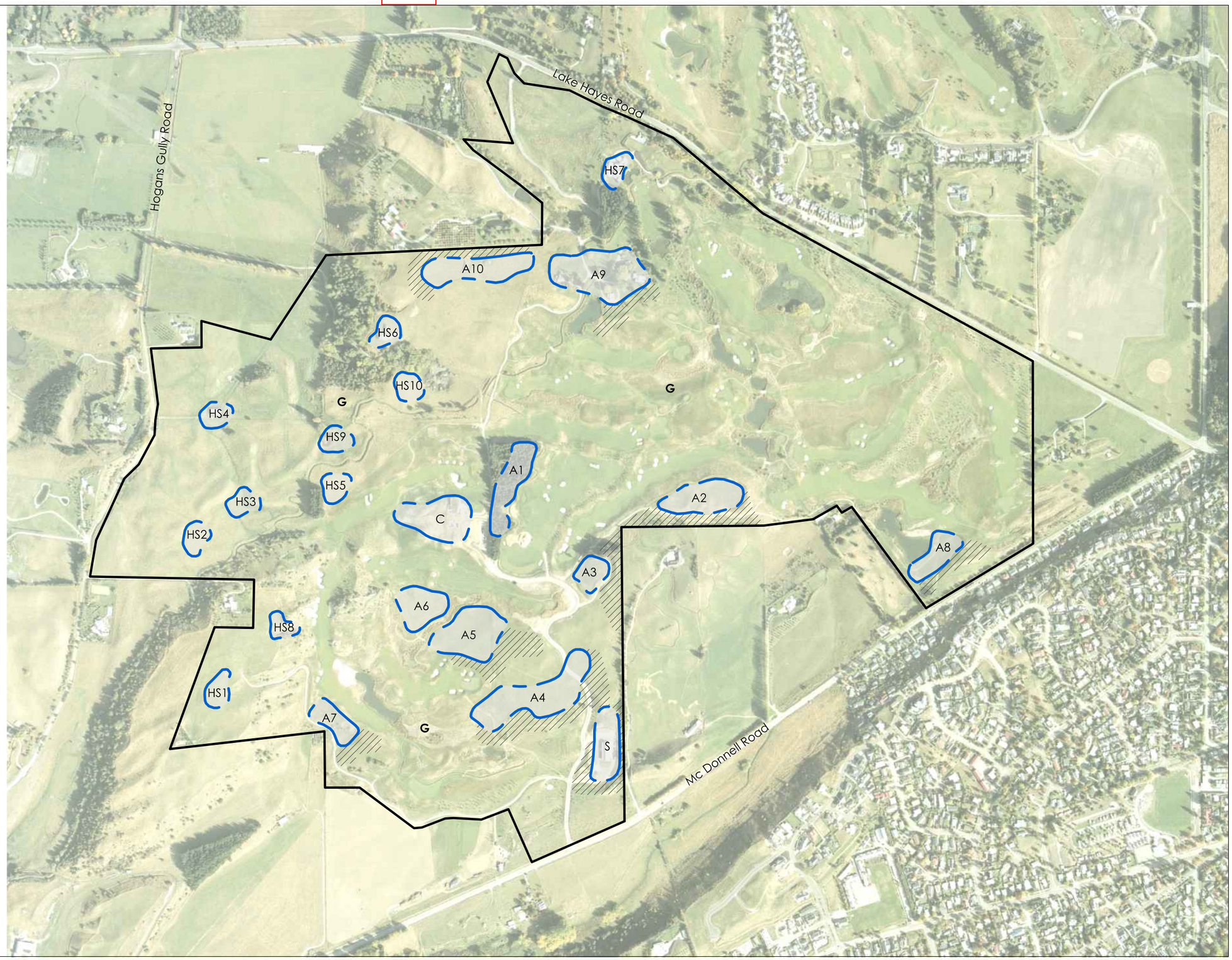
Activity Areas:

G: Golf course, open space and farming
C: Clubhouse
A: Visitor Accommodation / Residential
HS: Homesite (3,000m2)
S: Resort Services & Staff Accommodation

Note: all activity areas include G: Golf course, open space and farming

Overlays:

Landscape Amenity Management Area



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SCALE: 1:4,000 (A1); 1:8,000 (A3)

0 100 200 300

PLAN STATUS:

DP REVIEW

THE HILLS
STRUCTURE PLAN

DRAWN / REVIEWED: RT / JC
APPROVED: DT
DATE: 14.10.15

DRAWING NO:
MH_10_1_MLP_010F

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KEY:

Structure Plan Boundary

Activity Area

Activity Areas:

G: Golf course, open space and farming
C: Clubhouse
A: Visitor Accommodation / Residential
HS: Homesite (3,000m2)
S: Resort Services & Staff Accommodation

Note: all activity areas include G: Golf course, open space and farming

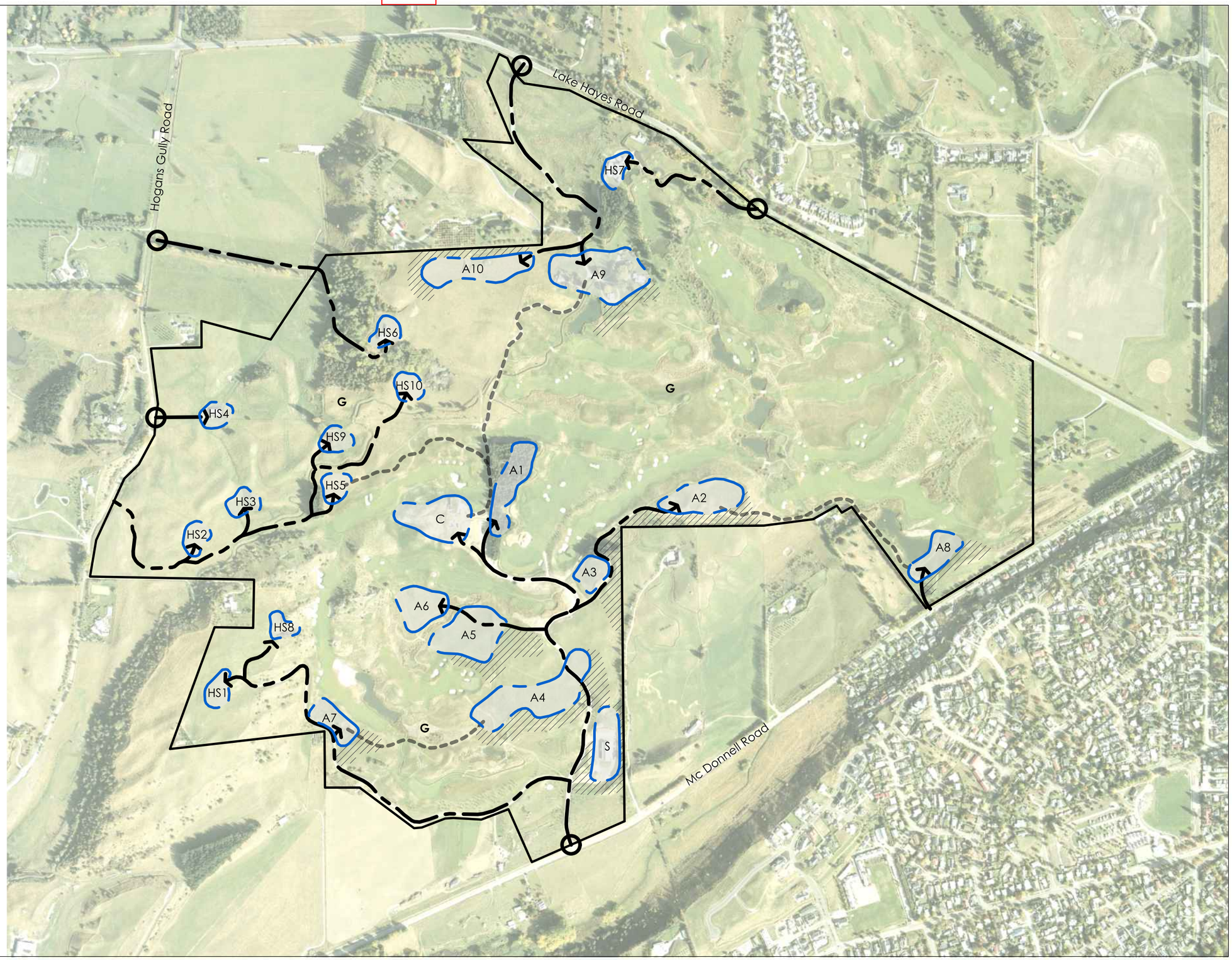
Overlays:

Landscape Amenity Management Area

Existing access point

Road access

Buggy / cart access



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PLAN STATUS:

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THE HILLS
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DRAWN / REVIEWED: RT / DT
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DATE: 14.10.15

DRAWING NO:
MH_10_1_MLP_011B

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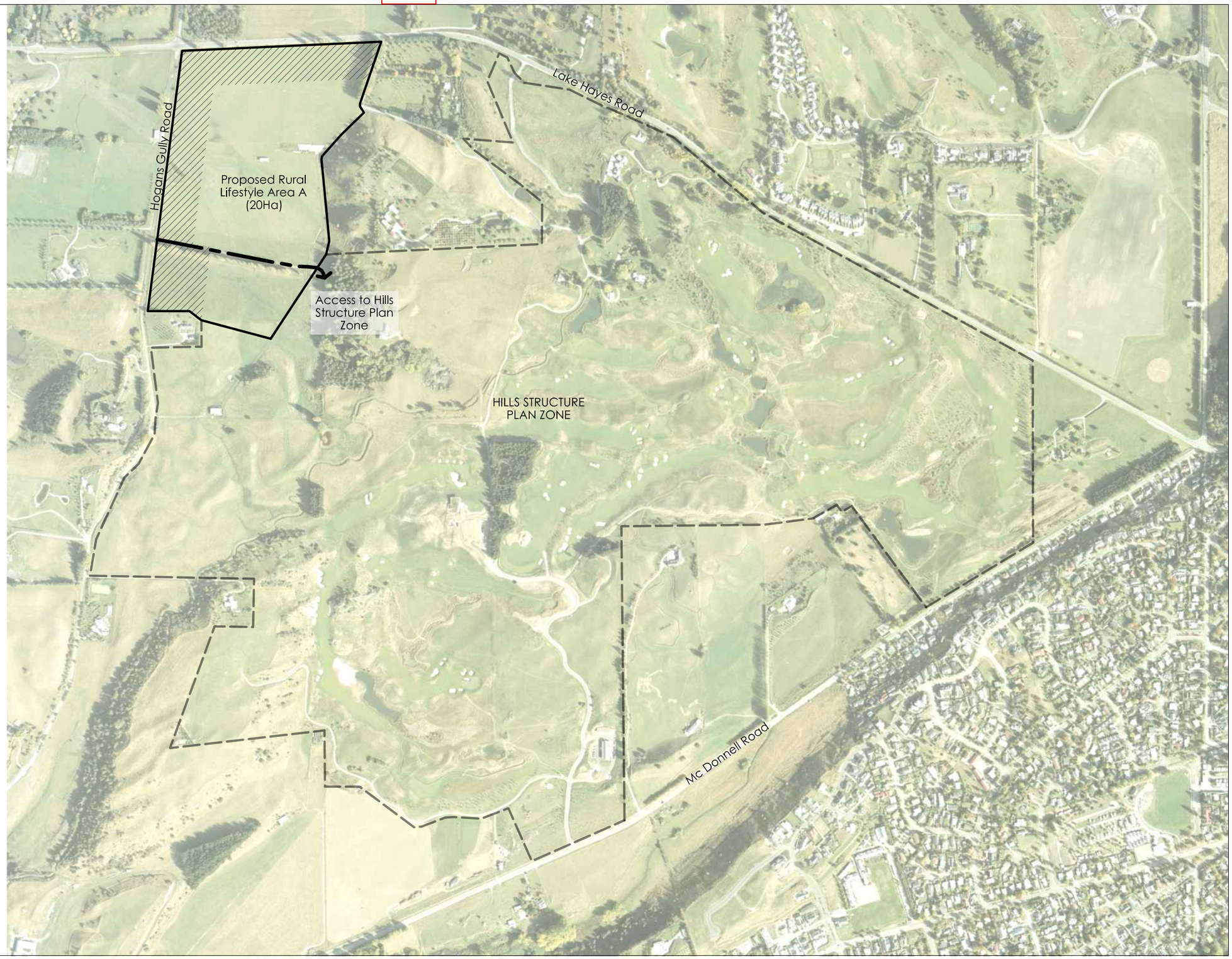
KEY:

Hills Structure Plan Boundary

Proposed zoning Areas

Overlays:

Landscape Amenity Management Area:
Includes tree planting, sited to preserve views of surrounding landscape and partially screen proposed dwellings



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SCALE: 1:4,000 (A1); 1:8,000 (A3)

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PLAN STATUS:

DP REVIEW

THE HILLS
PROPOSED RURAL LIFESTYLE AREA A

DRAWN / REVIEWED: RT / JC
APPROVED: DT
DATE: 14.10.15

DRAWING NO:
MH_10_1_MLP_012B

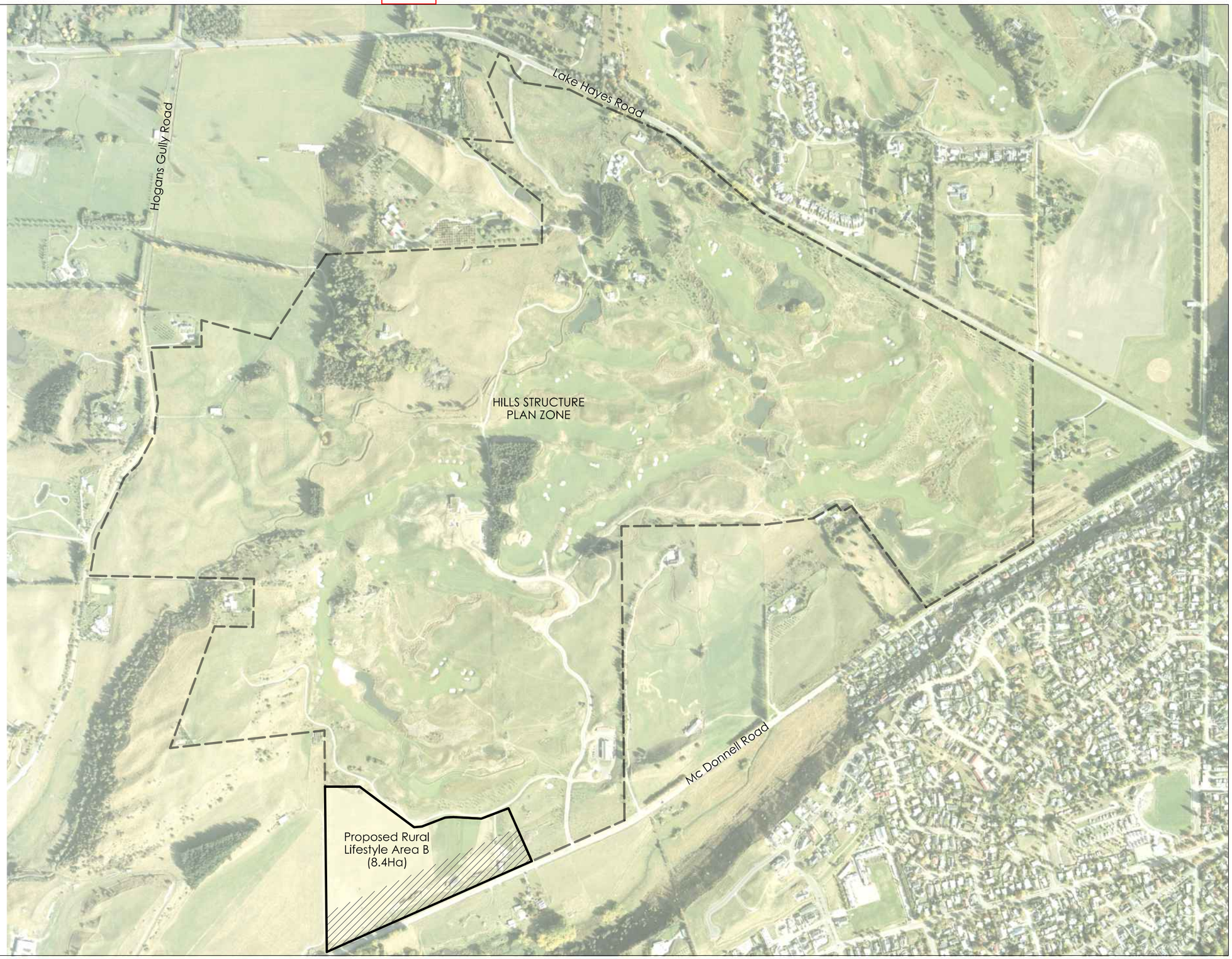
KEY:

Hills Structure Plan Boundary

Proposed zoning Areas

Overlays:

Landscape Amenity Management Area:
Includes tree planting, sited to preserve views of surrounding landscape and partially screen proposed dwellings



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SCALE: 1:4,000 (A1); 1:8,000 (A3)

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PLAN STATUS:

DP REVIEW

THE HILLS
PROPOSED RURAL LIFESTYLE AREA B

DRAWN / REVIEWED: RT / JC
APPROVED: DT
DATE: 14.10.15

DRAWING NO:
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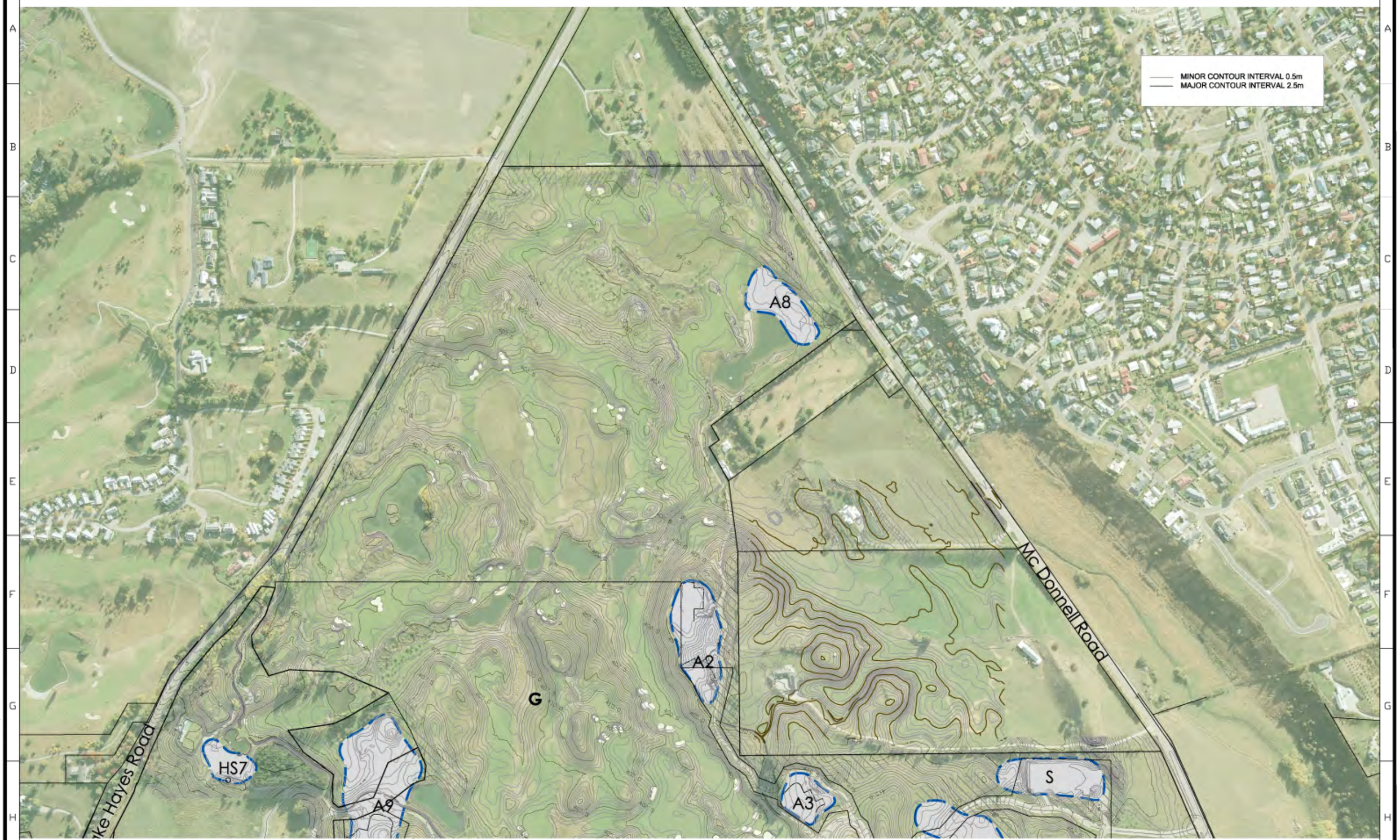

ORIGINAL SIZE A3 DO NOT SCALE, REFER ALL DISCREPANCIES TO THE ENGINEER

Notes:	Issue	Description	By	Date
	A	Preliminary Issue	JWPH	20.10.15

Project: NATURAL HAZARD ASSESSMENT

Title: TOPOGRAPHIC SITE PLAN 1

Client: TROJAN HELMET LTD

hadley consultants LTD
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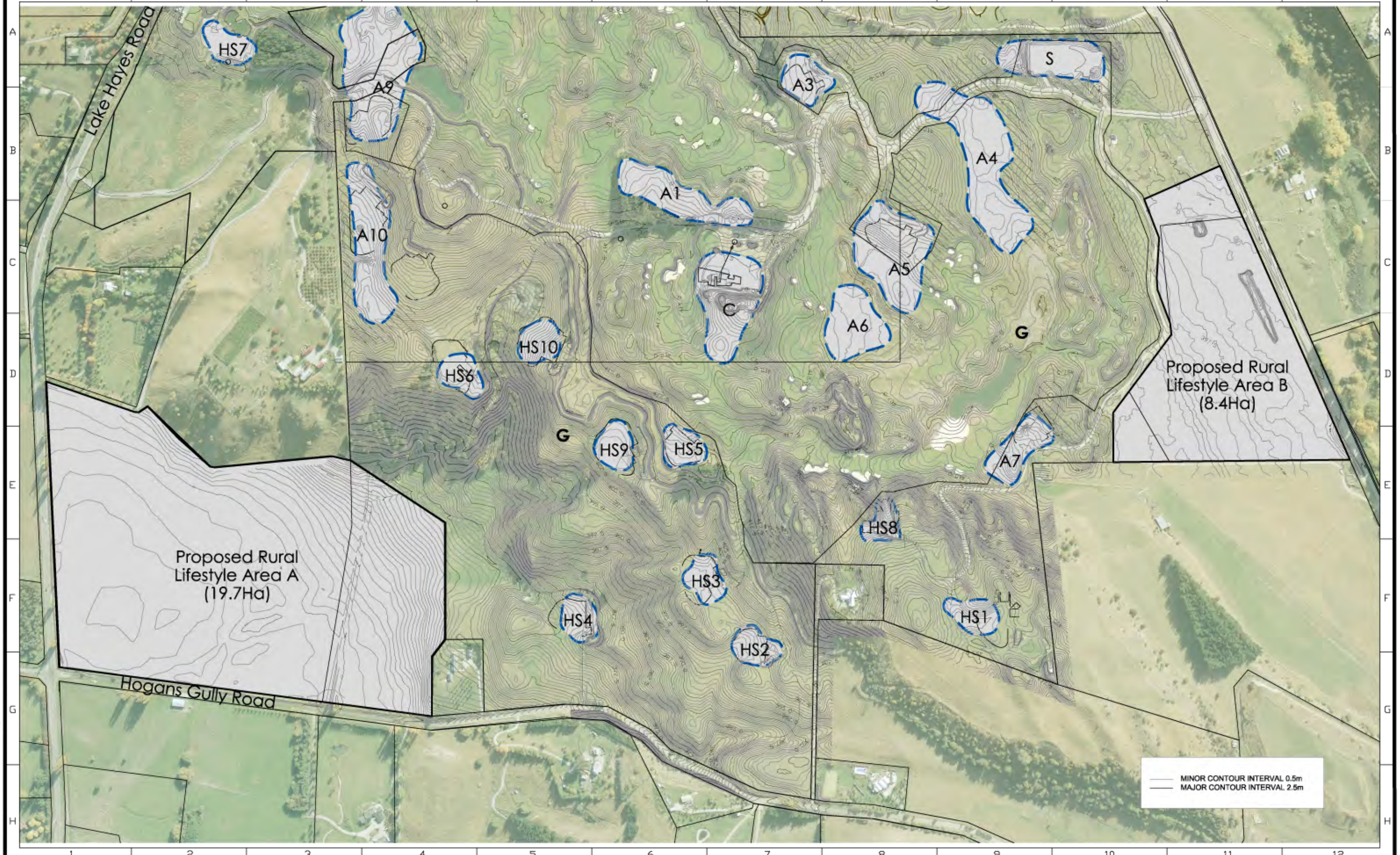

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A	Preliminary Issue	JWPH	20.10.15

Project: NATURAL HAZARD ASSESSMENT

Title: TOPOGRAPHIC SITE PLAN 2

Client: TROJAN HELMET LTD

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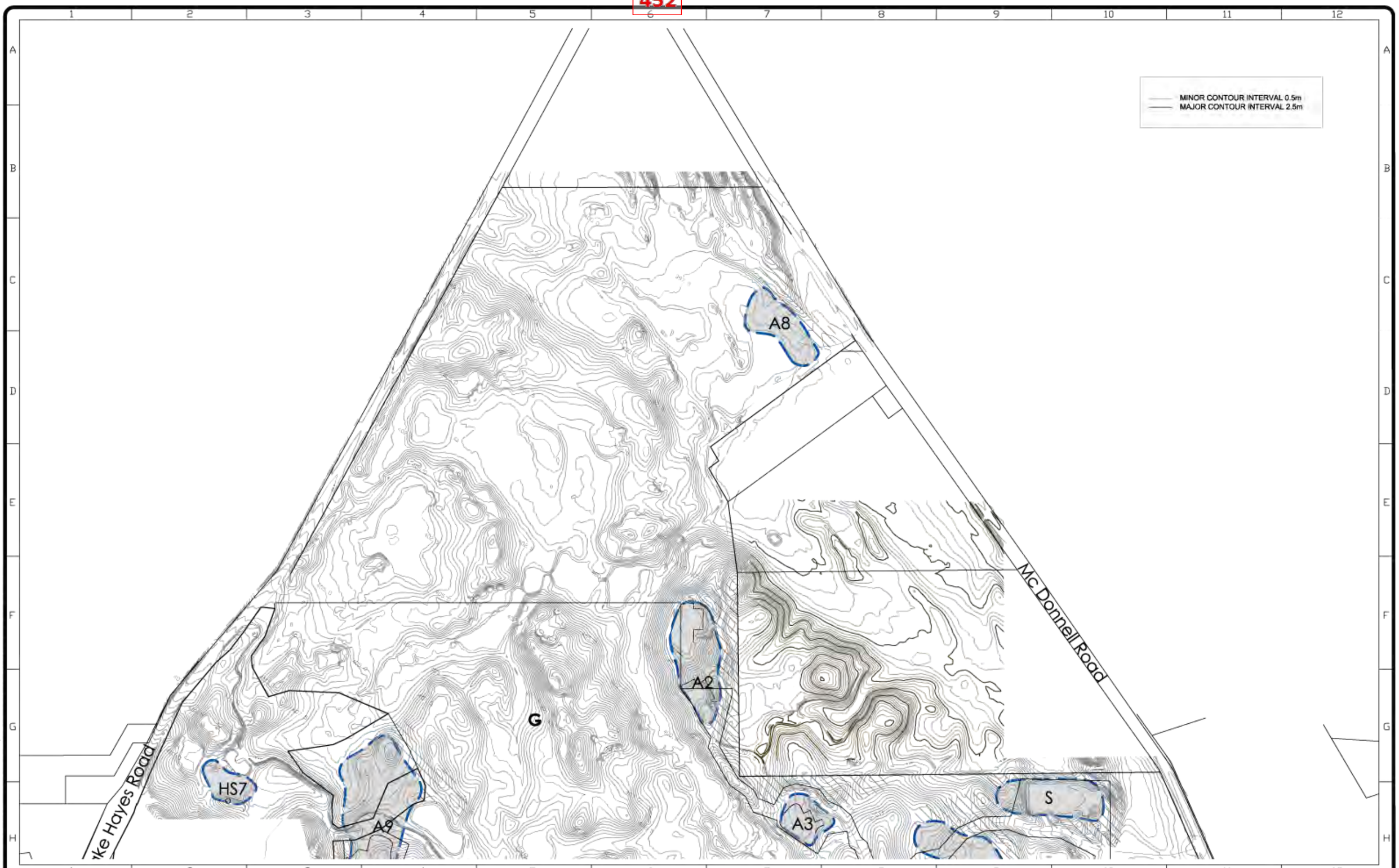

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Notes:

Issue	Description	By	Date
A	Preliminary Issue	JWPH	20.10.15

Project: NATURAL HAZARD ASSESSMENT

Title: ACTIVITY AREA PLAN 1

Client: TROJAN HELMET LTD

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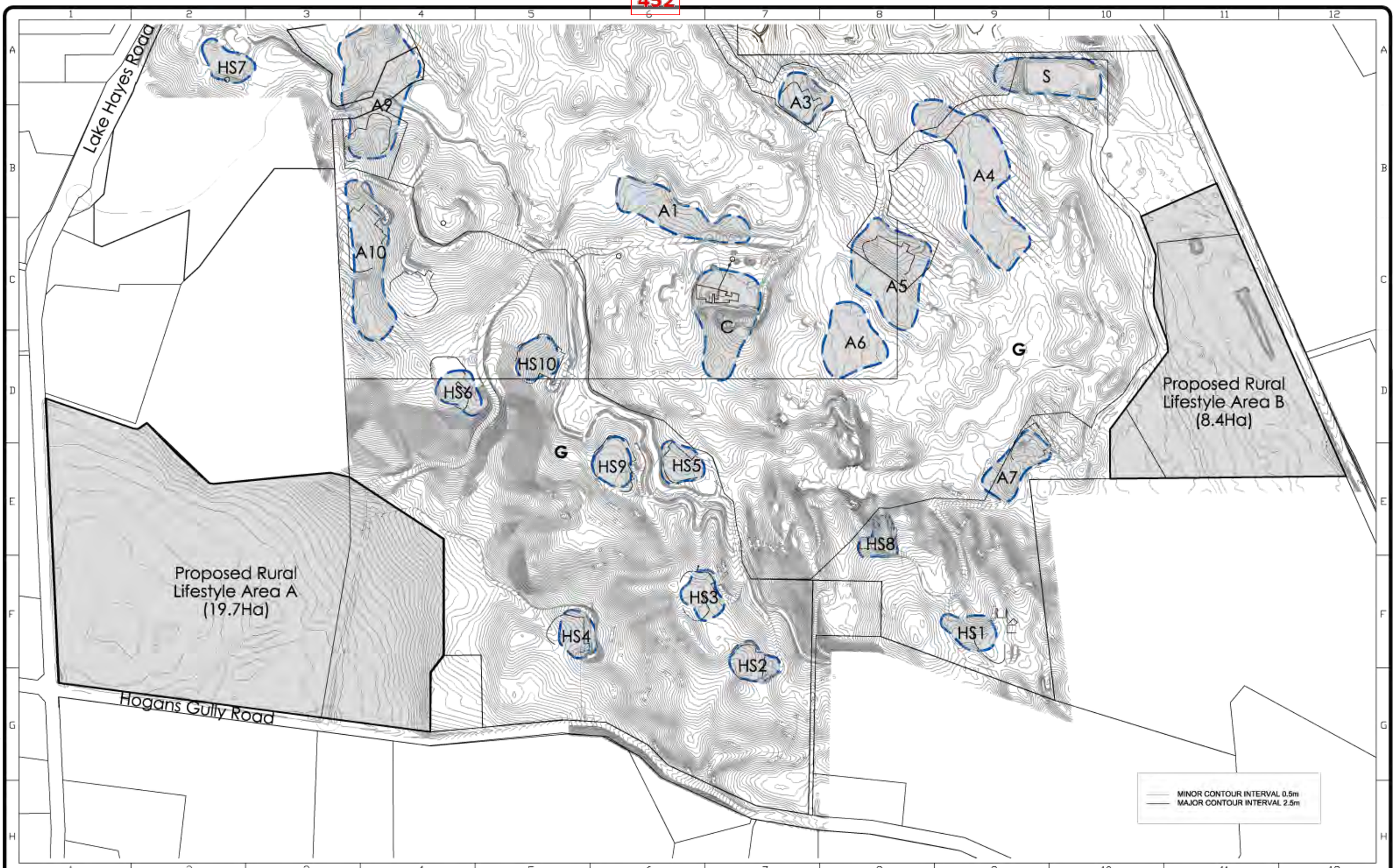

ORIGINAL SIZE: A3 DO NOT SCALE, REFER ALL DISCREPANCIES TO THE ENGINEER

Notes:	Issue	Description	By	Date
	A	Preliminary Issue	JWPH	20.10.15

Project: NATURAL HAZARD ASSESSMENT

Title: ACTIVITY AREA PLAN 2

Client: TROJAN HELMET LTD

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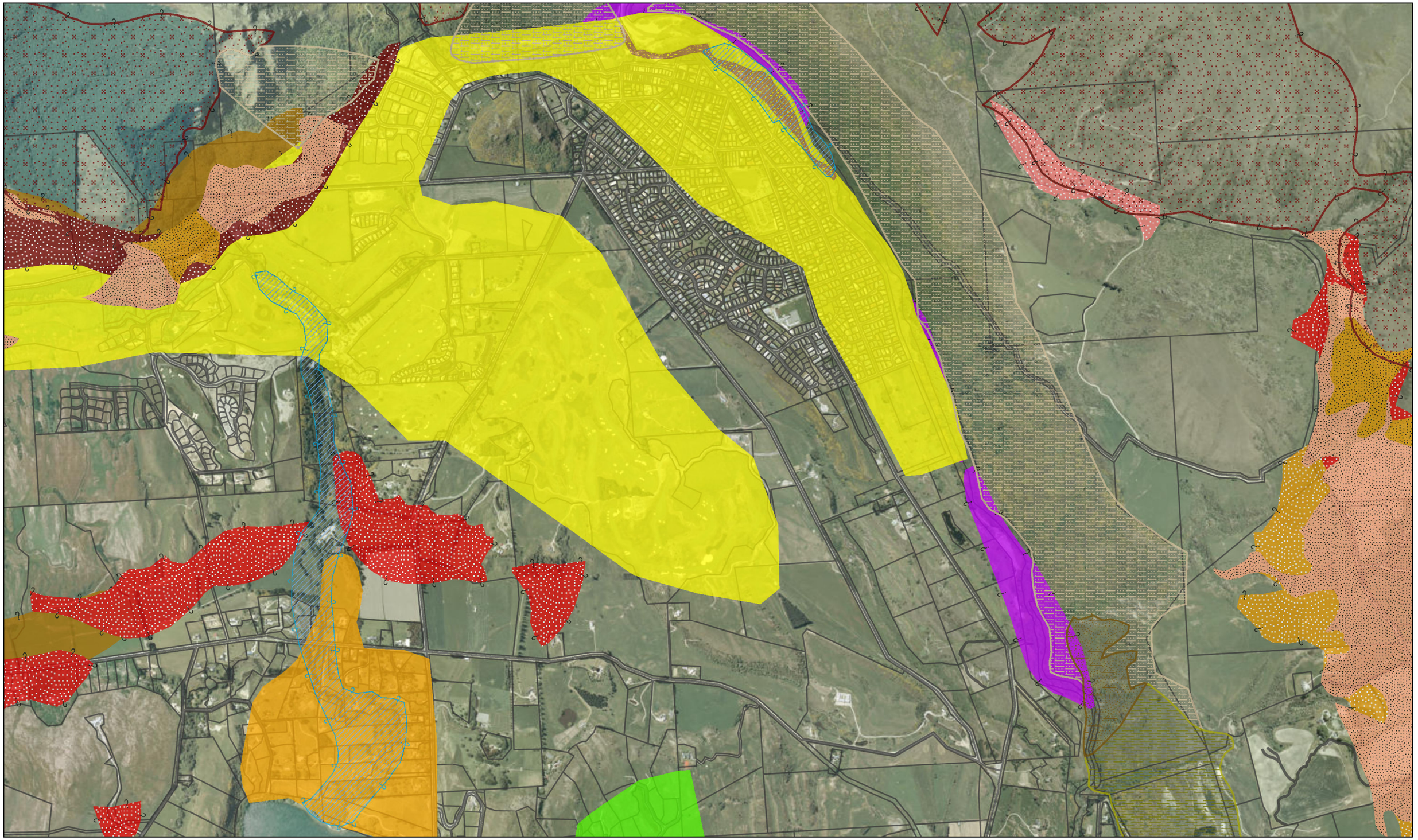
Appendix B

QLDC Hazard Maps



Queenstown Lakes District Council

Webmaps your view of your information

The Hills

19 October 2015

0 0.15 0.3 0.45 0.6 Kilometres

N

The Hills

Legend

Property Land

Parcel Boundaries

Property Address

Roads

Hazards

Active Fault - Location approximate

Inactive Fault - Location approximate

Flooding due to Rainfall

Flooding due to Damburst

Landslide: Active Pre-existing Schist Debris Landslides

Landslide: Pre-existing Schist Debris Landslides (Activity Unknown)

Landslide: Dormant Pre-existing Schist Debris Landslides

Landslide: Shallow Slips and Debris Flows in Colluvium

Landslide: Debris Flow Hazards

Landslide: Slope Failure Hazard in Superficial Deposits

Landslide: Rockfall

Landslide: Pre-existing or Potential Failure in Lake Sediments or Tertiary Sediments

Landslide: Piping potential in the Artesian Zone of the Wanaka Aquifer

Landslide: Potential Hazard - Debris Flood/Debris Flow

Landslide Areas - non verified

Erosion Areas

Alluvial Fan - Incision Line

Alluvial Fan - Channels

Alluvial Fan - Source Area

Alluvial Fan - Catchment Areas

Alluvial Fan - Hazard Area

Alluvial Fan - ORC: fan active bed

Alluvial Fan - ORC: fan recently active

Alluvial Fan - ORC: fan less recently active

Alluvial Fan (Regional scale) Active, Composite

Alluvial Fan (Regional scale) Active, Debris-dominated

Alluvial Fan (Regional scale) Active, Floodwater-dominated

Alluvial Fan (Regional scale) Inactive, Composite

Alluvial Fan (Regional scale) Inactive, Debris-dominated

Alluvial Fan (Regional scale) Inactive, Floodwater-dominated

Avalanche Areas

Liquefaction Risk: Nil to Low (T&T 2012)

Liquefaction Risk: Probably Low (T&T 2012)

Liquefaction Risk: Possibly Moderate (T&T 2012)

Liquefaction Risk: Possibly High (T&T 2012)

Liquefaction Risk: Possibly Susceptible (Opus 2002)

Liquefaction Risk: Susceptible (Opus 2002)

Appendix C

Figure 2

KEY:

Structure Plan Boundary

Activity Area

Activity Areas:

G:	Golf course, open space and farming
C:	Clubhouse
A:	Visitor Accommodation / Residential
HS:	Homesite (3,000m2)
F:	Farm
S:	Resort Services & Staff Accommodation

Note: all activity areas include G: Golf course, open space and farming

Overlays:

Landscape Protection Area

The Hills Structure Plan - Yield Schedule
Sep-10

Activity Area	Size	Density (unit/Ha)		Lots	
		Low	High	Low	High
A1	0.9 Ha	1	8	1	7
A2	0.9 Ha	1	8	1	7
A3	0.4 Ha	1	8	1	3
A4	1.7 Ha	1	8	1	13
A5	1.2 Ha	1	8	1	10
A6	0.7 Ha	1	8	1	5
A7	0.5 Ha	1	8	1	4
A8	0.6 Ha	1	4	1	2
A9	1.7 Ha	1	8	1	13
A10	1.1 Ha	1	8	1	8
		Subtotal		10	74
H1	0.3 Ha			1	1
H2	0.3 Ha			1	1
H3	0.3 Ha			1	1
H4	0.3 Ha			1	1
H5	0.3 Ha			1	1
H6	0.3 Ha			1	1
H7	0.3 Ha			1	1
H8	0.2 Ha			1	1
H9	0.3 Ha			1	1
H10	0.3 Ha			1	1
		Subtotal		10	10
		Total		20	84
Total Structure Plan Area	162.7 Ha				
Ave. Lot size (per total land area)				8.1 Ha	1.9 Ha

FOR DISCUSSION

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SCALE: 1:4,000 (A1); 1:8,000 (A3)

PLAN STATUS:
DRAFT

Fig. 2

QLDC hazard zonations. Depiction of liquefaction and alluvial fan hazards at site.

Liquefaction risk. Probably low

Alluvial fan. Active. Debris dominated.

THE HILLS
STRUCTURE PLAN

DRAWN / REVIEWED: RT / JC
APPROVED: DT
DATE: 14.09.15

DRAWING NO:
MH_10_1_MLP_010E

Appendix D

Figure 10

452

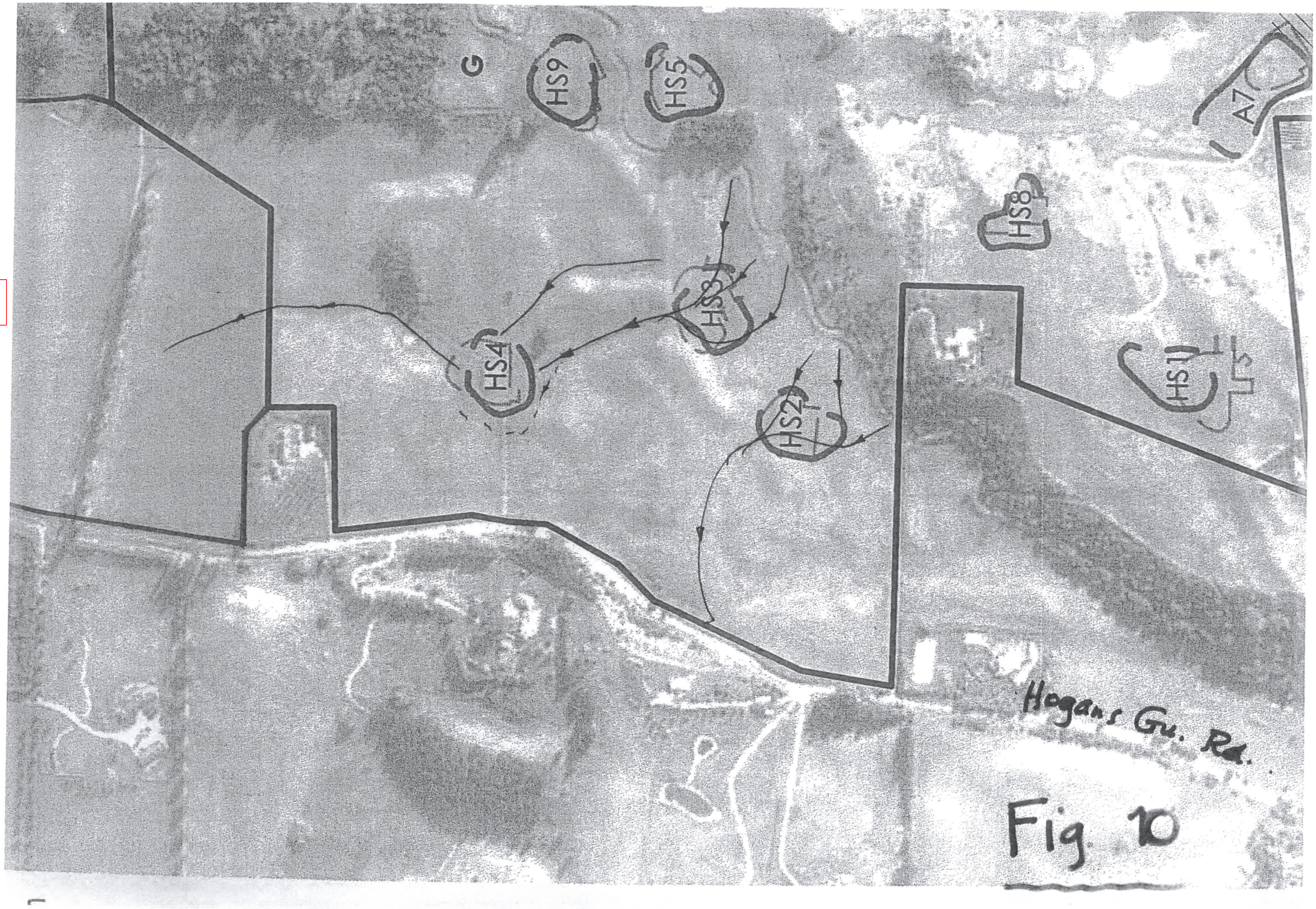

Fig 10

452

hadley consultants LTD

CONSULTING ENGINEERS STRUCTURAL / CIVIL / PROJECT MANAGEMENT / GEOTECHNICAL

Trojan Helmet Ltd

Hills Golf Course (including McDonnell Road Land) and Hogans Gully Road Land

Proposed District Plan Submission

Natural Hazard Assessment

hadley consultants LTD
CONSULTING ENGINEERS STRUCTURAL / CIVIL / PROJECT MANAGEMENT / GEOTECHNICAL

Contact Details:

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Responsible Engineer:
James Hadley
Director

Document Status

Revision	Author:		Reviewer:		
	Name	Signature	Name	Signature	Date
A (Initial Issue)	J. Hadley		J. McCartney		20 October 2015
B (For Submission)	J. Hadley		J. McCartney		21 October 2015
C (Final)	J. Hadley		J. McCartney		22 October 2015

Limitations

This report has been written for the particular brief to HCL from their client and no responsibility is accepted for the use of the report for any other purpose, or in any other context or by any third party without prior review and agreement.

In addition, this report contains information and recommendations based on information obtained by inspection, sampling or testing at specific times and locations with limited site coverage as outlined in this report. This report does not purport to completely describe all site characteristics and properties and it must be appreciated that the actual conditions encountered throughout the site may vary, particularly where ground conditions and continuity have been inferred between test locations. If conditions at the site are subsequently found to differ significantly from those described and/or anticipated in this report, HCL must be notified to advise and provide further interpretation.

Contents

1. Introduction

Trojan Helmet Ltd (THL) has engaged Hadley Consultants Limited (HCL) to conduct a natural hazards assessment of their land which comprises both the Hills Golf Course and an adjacent land holding which fronts Hogans Gully Road.

This report considers the relevant site conditions and natural hazard issues affecting the potential building development within possible development areas identified by others. Specifically, the natural hazard elements investigated and assessed are:

- Liquefaction hazard,
- Alluvial fan hazard, and
- Inundation and flood risk.

The purpose of this report is to provide a reference document to assess whether any natural hazard constraints exist in a global context which will adversely impact proposed development areas on the THL land holdings.

This report is intended to inform submissions made by THL on the Queenstown Lakes District Council's (QLDC) Proposed District Plan.

2. Nature of Proposed Development

The development proposed across the THL land comprises new zoned Rural Lifestyle Areas combined with a new Resort Zoning (the Hills Resort Zone) in which specific pockets of building development are identified for activities which include discrete Homesites, Visitor Accommodation, Farm and Resort Services and Staff Accommodation.

There are two primary Proposed Rural Lifestyle zones as follows;

- Proposed Rural Lifestyle Area A comprising a 19.7Ha block bounded by Hogans Gully Road to the south and Arrowtown – Lake Hayes Road to the west; and
- Proposed Rural Lifestyle Area B comprising an 8.4Ha block with frontage to McDonnell Road.

The remainder of the proposed development areas are located wholly within the existing Golf Course area (which will form the new Hills Resort Zone) and represent discrete pockets of development across the site.

The overall development sites and areas are indicated on the Darby Partners and HCL topographic drawings contained in Appendix A.

Some of the proposed development areas within the Golf Course site include building platforms previously consented under RM081223. Where relevant, previous work on these platforms has been considered in this more global evaluation of natural hazards impacting the land holding.

3. Scope of Assessment

The purpose of this report is to provide a global overview of the natural hazard issues which might affect development capability across the THL land holdings. In making this assessment, HCL have undertaken the following activities;

- Stereo pair photo analysis of geological features to identify potential areas of instability.
- Review of previous site investigation and assessment work by others for previous developments at the THL site. These investigations have been used to verify the HCL developed geological and geotechnical models adopted when assessing hazard.
- Detailed site walkover and geological mapping of all proposed development areas.
- Logging and mapping of open excavations and test pits across the site to confirm site lithologies.
- Review and consideration of QLDC Hazard Maps and their impact and relevance to the THL site following specific evaluation and verification of the geomorphology which exists.

It is intended that this document form a master Natural Hazards document for the THL land holdings which may be referred to when considering discrete planning submissions for the separate Rural Lifestyle A and B areas, and the other Activity Areas within the proposed Hills Resort Zone.

4. Site Description

The proposed development takes in the Hills Golf Course Land, located at 164 McDonnell Road approximately 1km south of Arrowtown and an area of land comprising 19.7Ha to the south of the Golf Course. This land, referred to as the Hogans Gully Land, is bounded by Hogans Gully Road to the south and Arrowtown – Lake Hayes Road to the west. The drawings included in Appendix A illustrate the site location and development areas.

The Golf Course is accessed from McDonnell Road which runs along the eastern boundary of the site and the Hogans Gully Land is accessed from Hogans Gully Road which runs along the southern site boundary.

Prior to the development of the golf course the THL land comprised farmland. The existing vegetative cover comprises a combination of long pasture, golf course green, landscaped areas and wooded areas. Vegetative cover on the Hogans Gully Land currently comprises farmland, paddocks and pasture.

The site includes several existing structures and these existing building sites have not been assessed as it is assumed they have been considered in detail as part of previous assessment work which allowed their construction.

Topographic contours of the site are shown on HCL Drawings 152859-S01 and S02 in Appendix A.

The site is undulating and ground levels typically vary between RL350m to RL430m. Slopes on the site are predominately gentle (5 to 15º); however, localised steep slopes are also present in some areas across the site.

Rock exposures also exist across the site, most notably on the Golf Course Land but also on the south facing flanks above the Hogans Gully Land.

There are a number of springs, gullies and manmade drainage features present across the site which will give rise to emphemeral flows during wet periods. The most significant drainage features include a stream which runs along the southern boundary of the THL land roughly parallel with Hogans Gully Road and an internal water race system which traverses the higher elevation Golf Course Land roughly west to east.

The site is primarily accessed from McDonnell Road, although additional farm track access is possible from Hogans Gully Road and from Arrowtown – Lake Hayes Road for existing private residences.

The site also includes a relatively complex system of internal roads, footpaths, cart paths and farm tracks that will impact local catchment boundaries and run off characteristics.

The land receives approximately 850mm of rainfall per annum and may be subject to drought conditions during the summer months.

5. QLDC Hazard Register and Previous Work

QLDC Hazard Maps (refer Appendix B) note that the site may be affected by;

- Liquefaction Hazard, assessed as provisionally LIC1.
- Alluvial Fan Hazard.

The liquefaction risk classification is shown to affect the majority of the Golf Course Land, whilst the Alluvial Fan Hazard is limited in its extent, taking in parts of the south facing slopes above the Hogans Gully Land.

In August 2006, Tonkin and Taylor Ltd (T&T) conducted a detailed investigation of the Golf Course area as part of a previous development proposal. This work by T&T included;

- Site evaluation,
- The excavation and logging of 12 test pits ranging in depth from 1.8m to 4.8m,
- Scala Penetrometer testing.

As part of their reporting T&T also provided soil parameters for foundation design and slope stability analysis.

T&T recorded that there was no evidence of slope instability recorded in the vicinity of the proposed building platforms, although some instability was observed in the oversteepened slopes above the Hogans Gully Land.

With regard to liquefaction, T&T noted that;

i) Subgrade materials were expected to provide good bearing for shallow foundations.
ii) Settlement of the subgrade materials under seismic loading is expected to be minimal.
iii) For detailed design in accordance with NZS 1170.5:2004, subsoil Class C conditions could be assumed.
iv) The regional groundwater table was not encountered and is expected to lie at a depth several metres below existing ground surface across the site.

Overall the T&T work did not identify any natural hazard issues (such as liquefaction) affecting any of the proposed Golf Course sites and concluded that building foundations were expected to be founded on glacial outwash and glacial sediment which should provide good bearing.

6. Geological Setting

6.1 Physiography

The site is located within the Wakatipu Basin, a feature formed by a series of glacial advances.

The most recent glacial advance occurred in the area between 10,000 and 20,000 years ago. This glacial activity has deposited glacial till, outwash and lake sediments over scoured bedrock.

Post glacial times were then dominated by erosion and deposition of alluvial gravels by local watercourses and river systems and during periods of high lake levels. This is relevant in the context of the Hogans Gully Land, where Shotover River derived alluvium is identified.

6.2 Site Lithologies

The predominant site lithologies across the site may be summarised as follows;

i) **Schist.** Schist outcrops irregularly, and is particularly evident beneath the higher terrain towards the south above the Hogans Gully Land. No particular distress was observed (eg glacial shearing/plucking), nor was there any evidence of mass movement.

ii) **Glacial Till.** Glacial Till dominates across the Golf Course Land, and is particularly notable by the presence of the hummocky terrain. Where visible in outcrop and suboutcrop, it is a lodgement till, comprising compact silt/sand, with subordinate gravel clasts, and generally rare cobbles with rare boulders.

There appear to be three different ages of tills, the oldest being a capping on schist in the vicinity of Sites HS1 and HS8, intermediate age tills form the hummocky terrain within the Golf Course proper, while the youngest till has intruded into the Hogans Gully Land. The latter is finer than the older type, but there isn't a marked difference in grading. Additional observations include;

- No mass movement noted in the till,
- Possible historic fill mounds sometimes hard to differentiate from insitu till.

iii) **River Alluvium.** The presence of river alluvium is defined in different areas of the site as follows;

- **Within Proposed Rural Lifestyle Area A:** This area is assessed as Shotover derived alluvium sourced from the west. Of particular note are the finger-like beach deposits which accumulated at the surface of the river alluvium by long shore drift when the lake was high.
- **Within Proposed Rural Lifestyle Area B:** Observations in a test pit near the western margin of this zone disclosed a well-bedded, river alluvium comprising well-graded sandy gravel to cobbly sandy gravel. Clasts appear to be Shotover sourced, hence it is likely that the sediments were deposited by a former Hayes Creek draining the basin south of Coronet Peak. Degradation has produced a stepped morphology, grading gently down towards McDonnell Road.

iv) **Fans.** Small fans do grade out into the Proposed Rural Lifestyle Area A, but they do not appear to be active. A small, intra-course fan is present near Site A6 and there may be other fan elements around the site and away from proposed development areas. Due to their lack of activity these fan areas require consideration in any detailed design, but are not considered a high risk hazard.

7. Specific Development Area Assessment

7.1 General

Consideration of the Development Area as a whole has been separated as follows;

i) Proposed Rural Lifestyle Area A,
ii) Proposed Rural Lifestyle Area B,
iii) Development Sites designated “HS” and “A” across the Golf Course area.

We note that due to the presence of existing structures the following sites were excluded from evaluation by HCL;

- Site S – the Resort Services Area,
- Site C – the Clubhouse,
- HS6 – An existing house site,
- HS7 – Existing loge.

We confirm that all other development areas indicated on the Darby Partners drawings contained in Appendix A have been assessed. To avoid repetition in reporting, we have grouped sites with common features.

7.2 Liquefaction Risk and Flood Hazard

We collectively address the Liquefaction Risk noted by QLDC as affecting Proposed Rural Lifestyle Area B and all of the HS and A development areas within the Golf Course Land.

HCL’s assessment of the site lithologies is that the Golf Course Land is mantled by glacial till comprising compact sands and gravels with a regional groundwater level located at depth. Schist bedrock outcrops in several locations and neither the compact till or the bedrock are susceptible to liquefaction. Further, Proposed Rural Lifestyle Area B includes alluvial deposits, again with a significant depth of groundwater.

HCL’s assessment is also verified by the previous reporting and site investigation work of T&T.

The confirmed presence of compact glacial tills and the absence of shallow groundwater allow us to confirm that liquefaction hazard is not a relevant risk for any of the proposed development areas.

A flood hazard is not recorded by QLDC and we confirm that subject to normal cut off drainage and catchment management, no large scale flood or inundation risk exists.

7.3 Proposed Rural Lifestyle Area A

Observations relevant to this area include;

- Greater than 50% of the proposed site is located on flat to gently sloping terrain comprising Shotover-derived alluvium.
- Some inactive fan elements encroach into the development area from the north and northeast mantling both glacial till and alluvial deposits in these areas. This is depicted in Figure 2 contained in Appendix C.
- Streams associated with the fan elements are small and assessed as ephemeral with minor source catchments.
- Former high level Lake Wakatipu storm benches are identifiable features in the central reaches of the site and are well drained.
- Based on field inspection and the small size of the streams and source catchments, we do not believe the QLDC classification of the fan elements as active and debris dominated to be correct.

In summary, we believe that the alluvial fan hazard risks associated with this development area are very low subject to;

a) Provision of normal cut off drainage measures to control upslope runoff from ephemeral watercourses.
b) Further test pitting as part of any resource consent application to confirm the age and activity of the fan deposition.

7.4 Proposed Rural Lifestyle Area B

The following observations were made with respect to Proposed Rural Lifestyle Area B;

- The area contains alluvial deposits and consists of low relief with terraces degrading to the east.
- The exposed cut in the western edge of the development area shows Shotover-derived alluvium circa 23,000 years old comprising sandy gravels.
- The lithology is consistent across the site with the depth to groundwater likely to exceed 10m.

In summary, and noting our earlier comment under Section 7.2 with regard to liquefaction and flood risk, we again believe that the natural hazard risks associated with this development area are very low.

7.5 Sites Requiring Little or No Mitigation

The following sites have been assessed and grouped as relatively benign with minimal mitigation required for building development. These sites are;

- A1,
- A2,
- A3,
- A4,
- A5,
- A9,
- HS1,
- HS5, and
- HS8.

Other than the southern extent of A4 where a small depression exists, all of these sites are well drained with competent subgrade conditions. The sites are considered very low risk with regard to natural hazard where normal building controls around verification of bearing capacities for foundation design along with the provision of positive surface drainage control will allow development of these sites.

7.6 Site A8

Site A8 at the northern end of the Golf Course Land occupies a low relief mound on the north east side of the low relief pond.

Concern exists that the building or development area could include uncertified fill as part of pond construction. The relative heights of the pond water level (controlled by its outlet) and likely subgrade levels for foundations increases the risk of saturated subgrade conditions.

The site is not subject to natural hazard, but should be the subject of a specific geotechnical investigation to confirm the presence or otherwise of uncertified fill prior to the construction of any building.

7.7 Site A6

This site occupies a low relief localised fan which grades out from the hummocky till zone to the west. The site is located slightly above the creek level, suggesting a perched water table may be present in this area.

Some surface water control from the catchment to the west is required.

Again, the site is not subject to any natural hazard issues, but prior to construction of buildings the site should be subject to a specific geotechnical investigation to confirm the nature and extent of any fan materials and presence or otherwise of a perched water table which may require draining.

7.8 Site A10

This site takes in a substantial area of saturated ground in a through-drainage depression heading south. There are also overland flow issues to be resolved from the steep terrain catchment to the east.

The site could be developed subject to specifically designed drainage and ground improvement works involving cut to waste, installation of piped stormwater reticulation including resolution of secondary overflow issues and import to fill to achieve positive drainage to the area and to provide suitable foundation conditions.

7.9 Site A7

This site is currently constrained by existing services due to the presence of a pump shed, transformer and inspection panels.

There is also localised uncertainty regarding lithologies with the possible presence of fill due to the services modifications.

There are no natural hazard issues affecting the site, however we recommend a detailed geotechnical investigation to define fill areas prior to any building construction occurring.

7.10 Site HS10

This site is affected by water race leakage concentrating in the slope comprising the house site area.

Prior to building development at this site it will be necessary to;

- Complete subsurface investigations to confirm the impact of the race leakage on overall slope stability.
- Pipe the water race for long term security of the site and provide for some form of diversion away from buildings in the event of a catastrophic pipe rupture.

7.11 Site HS9

This site is located in a localised depression and it will be necessary to resolve drainage to the south to avoid a ponding risk.

Similar to HS10, it will be necessary to;

- Complete subsurface investigations to confirm the depth to competent bearing materials (till) in the base of the depression due to likely thick colluvium/soil layer accumulation in the natural basin.
- Pipe the water race for long term security of the site and provide for some form of diversion away from buildings in the event of a catastrophic pipe rupture in the race.

7.12 Sites HS2, HS3 and HS4

These three sites are all located in the valley lines of ephemeral drainage systems. Consequently they are presently wet and saturated. Figure 10 included in Appendix D illustrates the location of the sites and how the channel and ephemeral gully systems affect each area.

It will be possible to develop Sites HS2, HS3 and HS4 if drainage, diversion and ground improvement work is completed, but we recommend that at the time detailed house designs are proposed, consideration is given to locating construction to higher relief ground within the respective Housesite areas. This will minimize the diversion and drainage works required.

All of HS2, HS3 and HS4 are subject to risk from a failure in the water race. Again, piping of the race and consideration of diversions in the event of a breach are recommended to mitigate this risk.

8. Conclusions and Recommendations

Based on our site evaluation and assessment work we have made the following conclusions with regard to Natural Hazards and how they impact the THL Golf Course Land (encompassing the proposed Hills Resort Zone and proposed Rural Lifestyle Area B Zone) and Hogans Gully Land (encompassing the proposed Rural Lifestyle Are A Zone);

Natural Hazard Risks

i) The Golf Course Land, including Proposed Rural Lifestyle Area B where alluvial deposits are identified, comprises competent and compact glacial till underlain by near surface schist bedrock. These materials are not susceptible to liquefaction and the risk of liquefaction is further reduced by low regional groundwater levels.

ii) Based on our assessment and investigation of the Golf Course Land, the provisional classification of the site as an LIC1 liquefaction risk by QLDC is not valid. The risk of liquefaction impacting the site is assessed as very low and liquefaction does not constrain the site as a natural hazard.

iii) The Proposed Rural Lifestyle Area A (Hogans Gully) Land comprises predominately alluvial material where the northern section of the Proposed Rural Lifestyle Area A may potentially be impacted by an alluvial fan hazard. Based on our assessment we don't believe the fan area is active and in the event it was active, its extent would be significantly reduced from that indicated by QLDC Hazard Maps. We have assessed any risk from alluvial fan hazard as low, recognising that if further investigation confirms activity, the risk can be mitigated through bunding protection and regrading at the time of resource consent.

iv) None of the land areas or development areas are subject to regional flood or inundation hazard.

Specific Development Site Controls

v) Prior to any building construction occurring we recommend that sites A6, A7 and A8 require specific geotechnical investigation and design of foundations by a Chartered Professional Engineer. This investigation shall include rationalisation of cut off drainage to improve subgrade conditions and to address overland flow paths.

vi) Sites HS9 and HS10 are impacted by the existing water race and potential leakage from this race. Prior to any building construction occurring we recommend that a specific geotechnical investigation be completed by a Chartered Professional Engineer to confirm the extent of potential soil accumulation in the depression on HS9 and slope stability impacts of the water race on HS10. Both sites will require piping of the water race and diversion design in the event of a catastrophic pipe breach.

vii) Development sites A10, HS2, HS3 and HS4 are more complex sites as a result of being sited across some natural drainage paths. The sites are not subject to large scale natural hazard risk, but to develop them will require specific design of works to cut off and divert existing flow paths to prevent site inundation, and to address hazards associated with the water race to the north. To ensure that these site development issues are properly addressed, we recommend that prior to any building construction occurring, specific engineering design of drainage and ground improvement works be completed by a Chartered Professional Engineer. We recommend consideration be given to refining the location of these development sites so that they take in higher ground within their respective activity areas, removed from natural drainage paths.

Appendix A

Darby Partners and HCL

Topographic Drawings

KEY:

Structure Plan Boundary

Activity Area

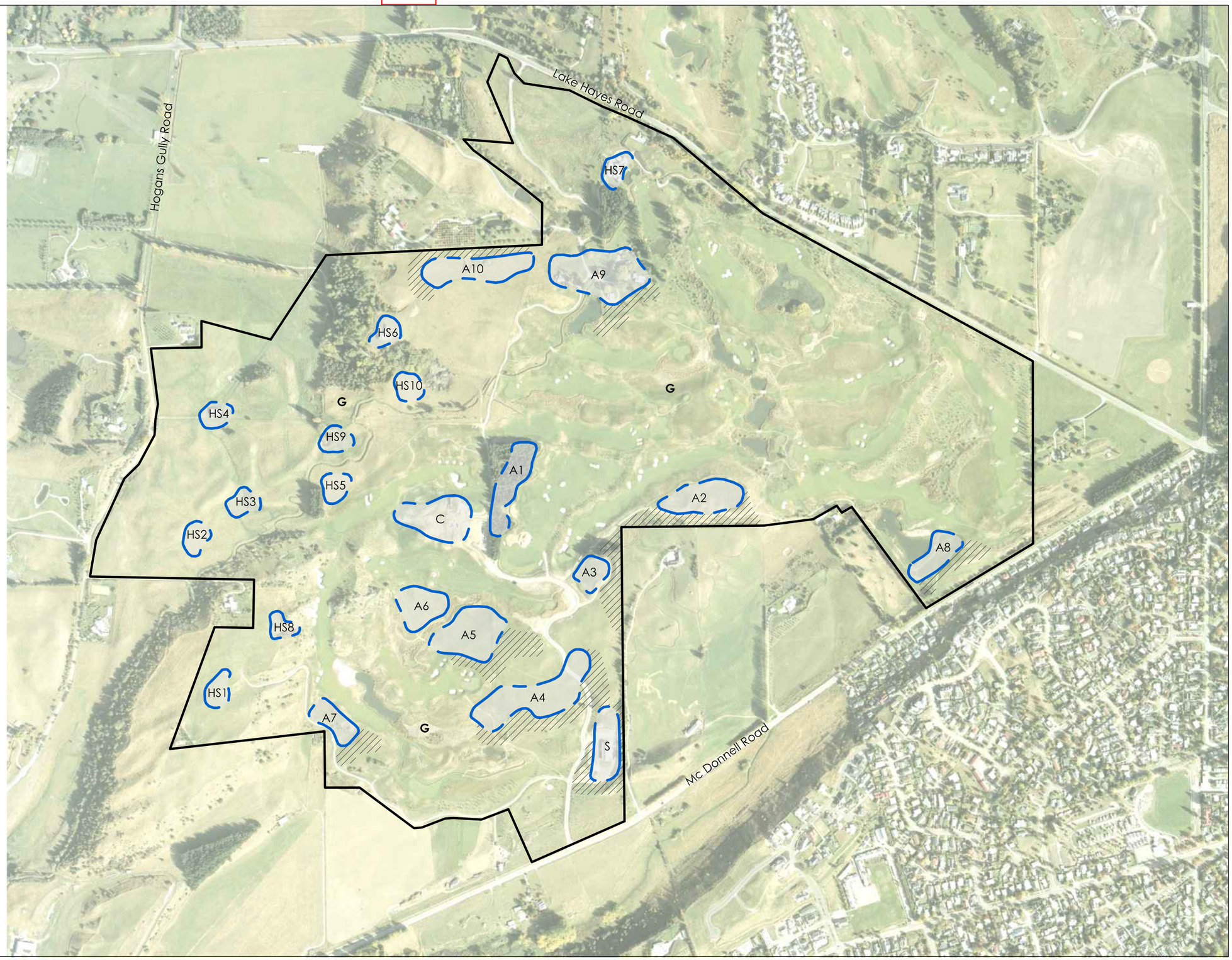
Activity Areas:

G: Golf course, open space and farming
C: Clubhouse
A: Visitor Accommodation / Residential
HS: Homesite (3,000m2)
S: Resort Services & Staff Accommodation

Note: all activity areas include G: Golf course, open space and farming

Overlays:

Landscape Amenity Management Area



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SCALE: 1:4,000 (A1); 1:8,000 (A3)

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PLAN STATUS:

DP REVIEW

THE HILLS
STRUCTURE PLAN

DRAWN / REVIEWED: RT / JC
APPROVED: DT
DATE: 14.10.15

DRAWING NO:
MH_10_1_MLP_010F

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KEY:

Structure Plan Boundary

Activity Area

Activity Areas:

G: Golf course, open space and farming
C: Clubhouse
A: Visitor Accommodation / Residential
HS: Homesite (3,000m2)
S: Resort Services & Staff Accommodation

Note: all activity areas include G: Golf course, open space and farming

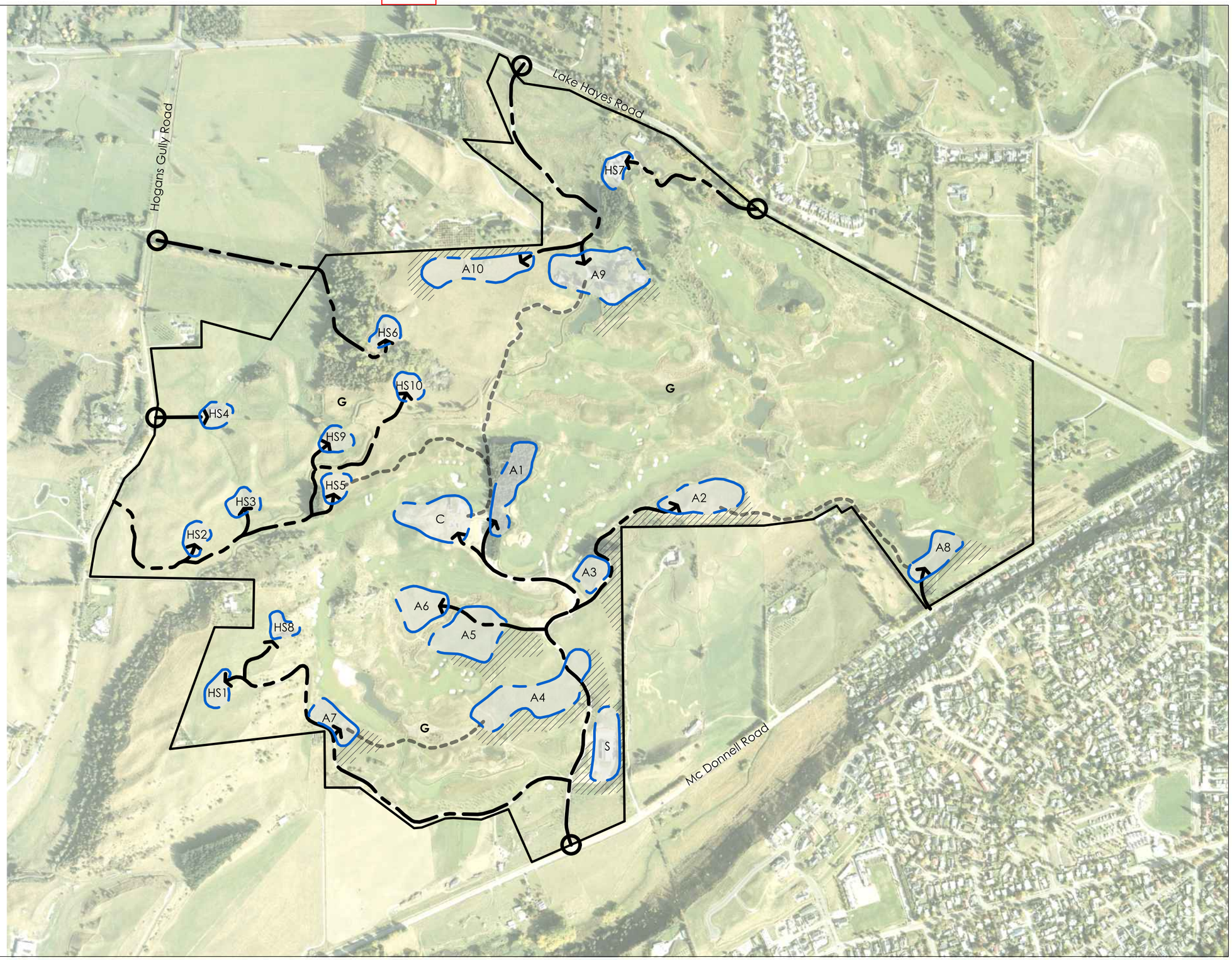
Overlays:

Landscape Amenity Management Area

Existing access point

Road access

Buggy / cart access



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PLAN STATUS:

DP REVIEW

THE HILLS
STRUCTURE PLAN - ACCESS

DRAWN / REVIEWED: RT / DT
APPROVED: DT
DATE: 14.10.15

DRAWING NO:
MH_10_1_MLP_011B

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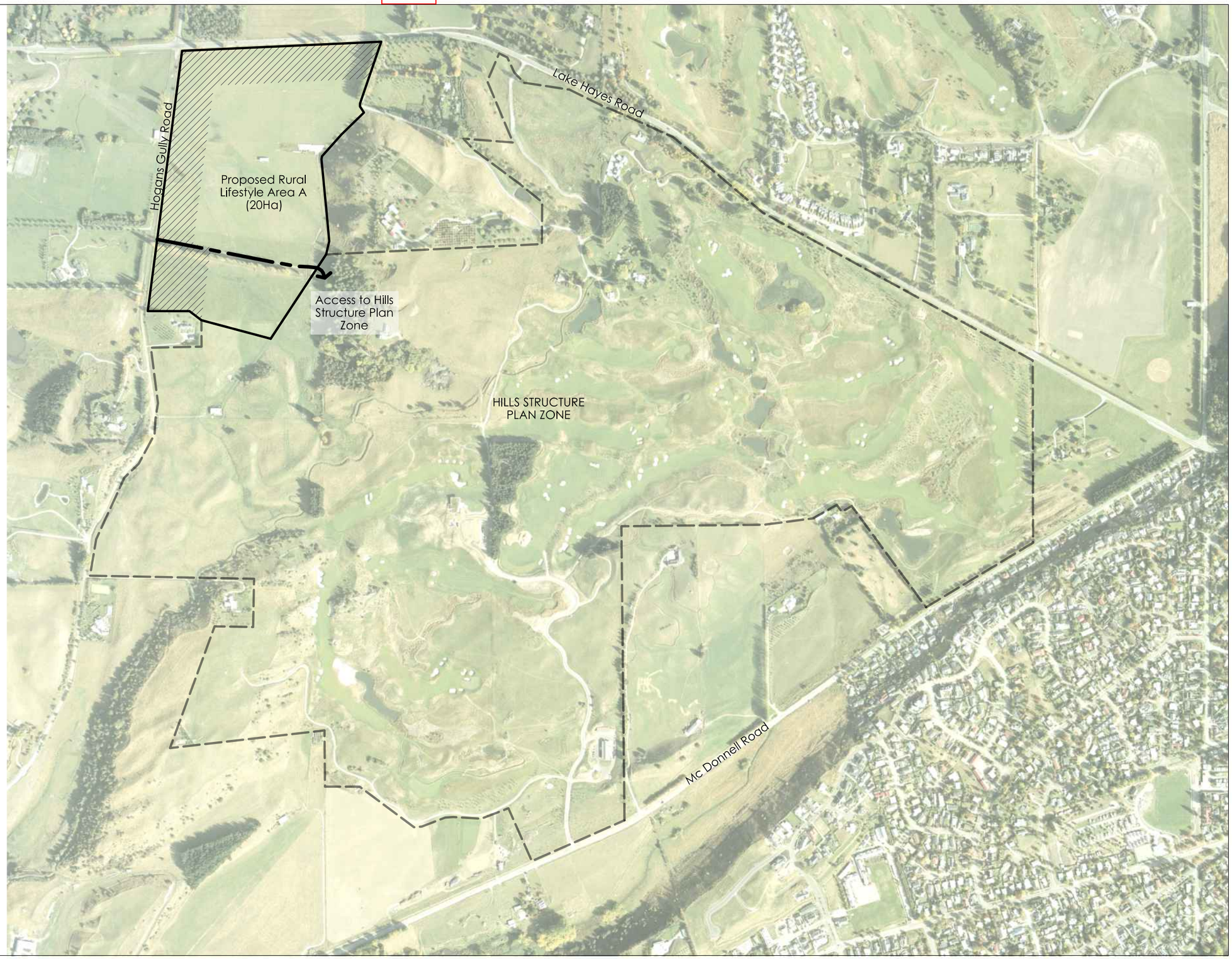
KEY:

Hills Structure Plan Boundary

Proposed zoning Areas

Overlays:

Landscape Amenity Management Area:
Includes tree planting, sited to preserve views of surrounding landscape and partially screen proposed dwellings



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PLAN STATUS:

DP REVIEW

THE HILLS
PROPOSED RURAL LIFESTYLE AREA A

DRAWN / REVIEWED: RT / JC
APPROVED: DT
DATE: 14.10.15

DRAWING NO:
MH_10_1_MLP_012B

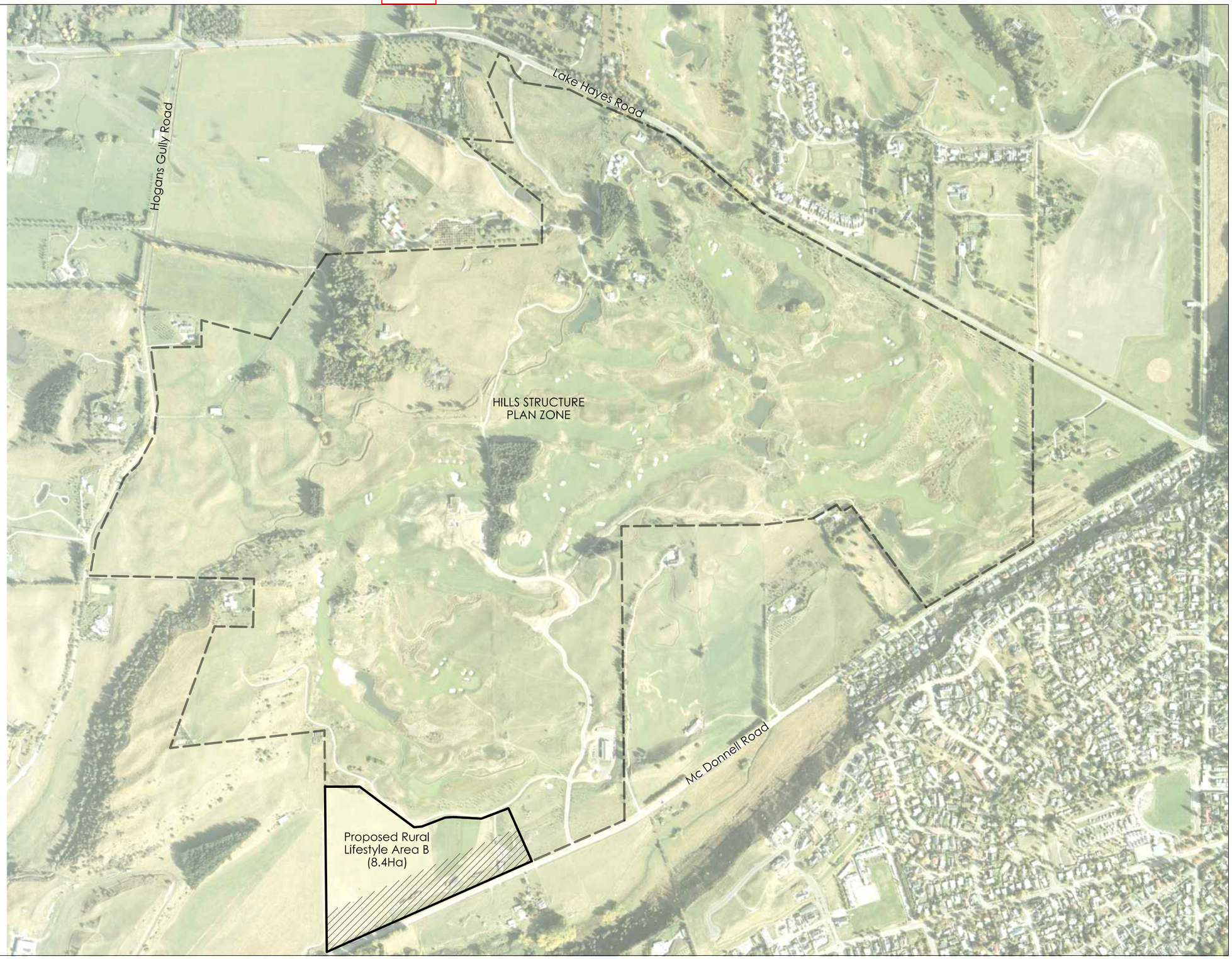
KEY:

Hills Structure Plan Boundary

Proposed zoning Areas

Overlays:

Landscape Amenity Management Area:
Includes tree planting, sited to preserve views of surrounding landscape and partially screen proposed dwellings



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PLAN STATUS:

DP REVIEW

THE HILLS
PROPOSED RURAL LIFESTYLE AREA B

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APPROVED: DT
DATE: 14.10.15

DRAWING NO:
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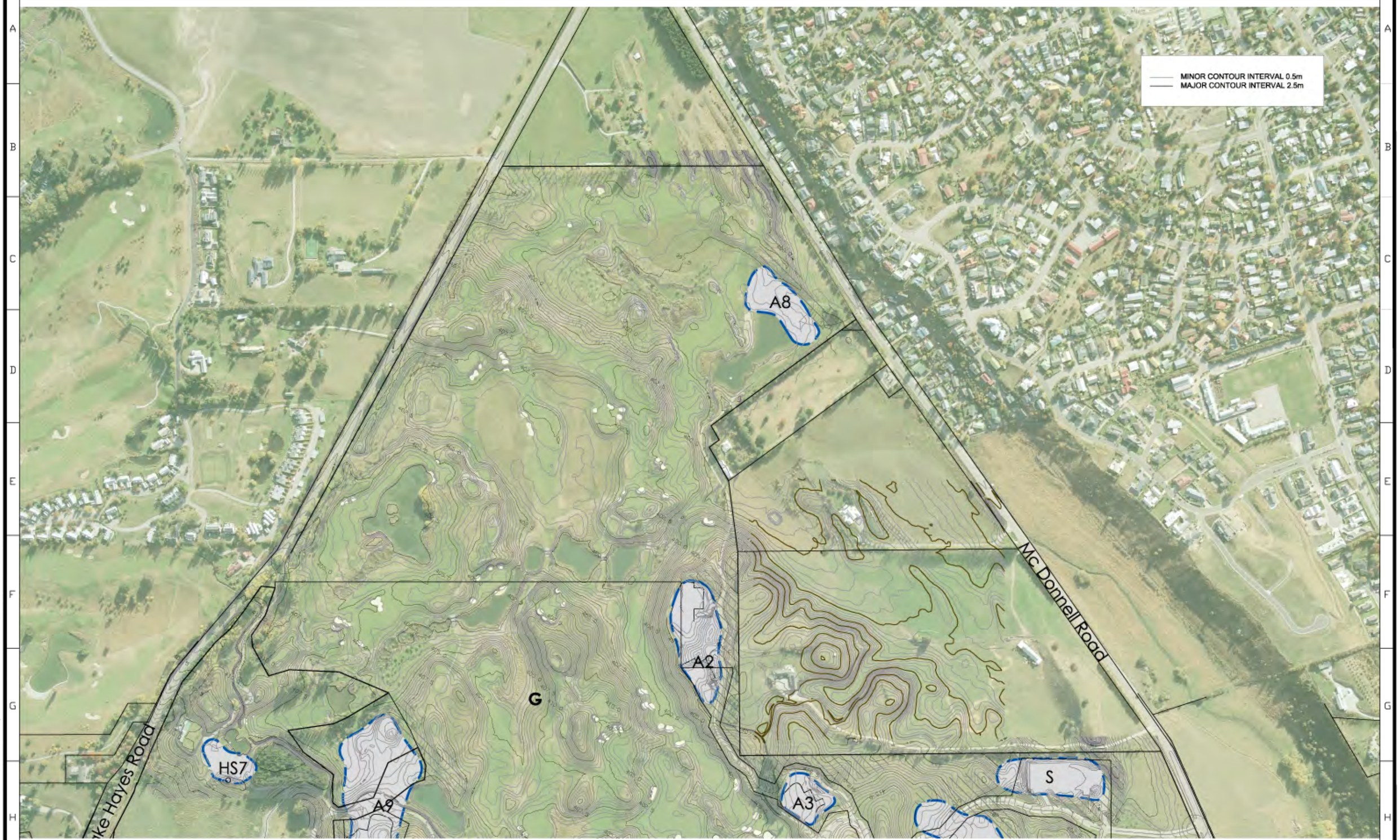

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Project: NATURAL HAZARD ASSESSMENT

Title: TOPOGRAPHIC SITE PLAN 1

Client: TROJAN HELMET LTD

hadley consultants LTD
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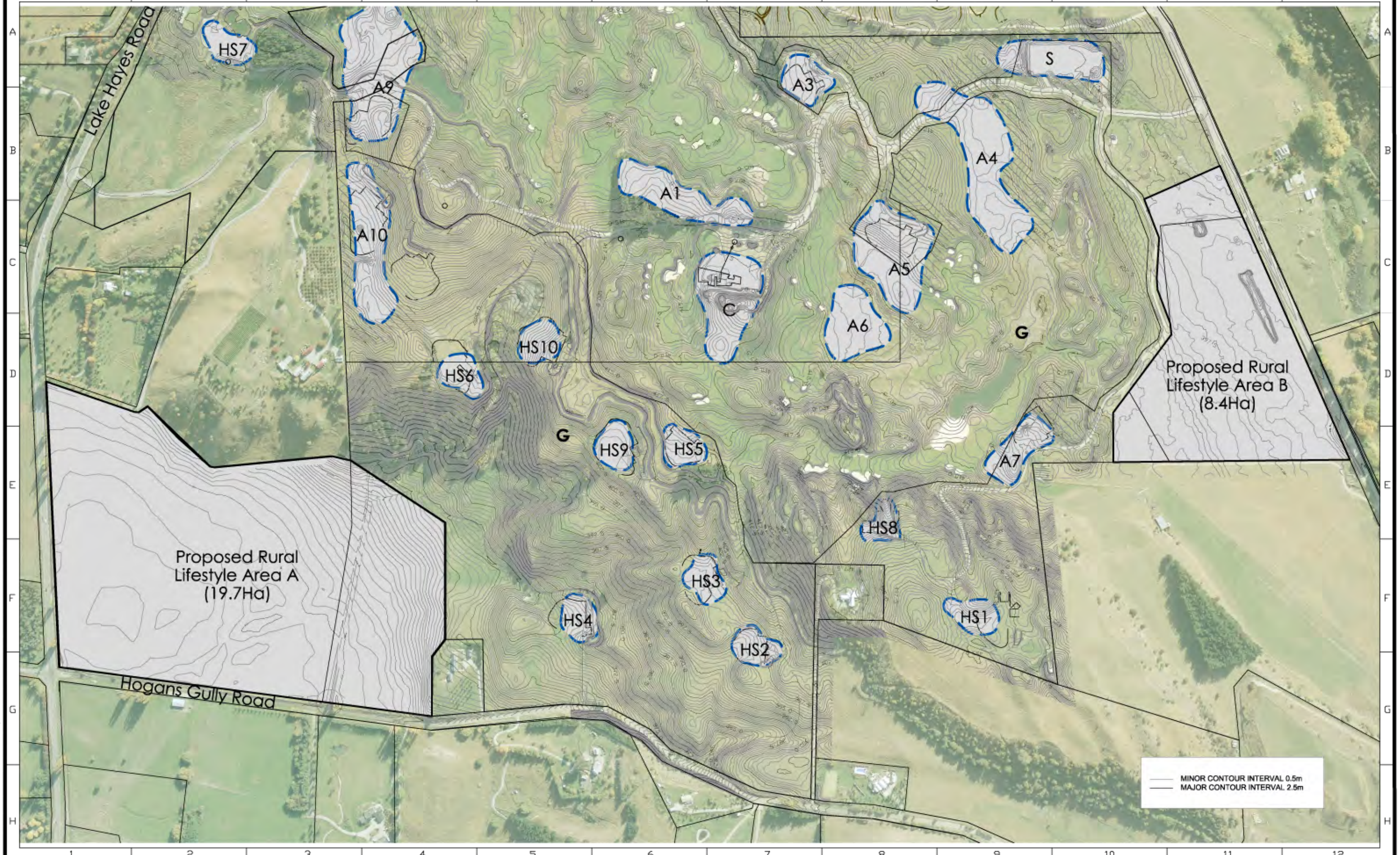

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Issue	Description	By	Date
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Project: NATURAL HAZARD ASSESSMENT

Title: TOPOGRAPHIC SITE PLAN 2

Client: TROJAN HELMET LTD

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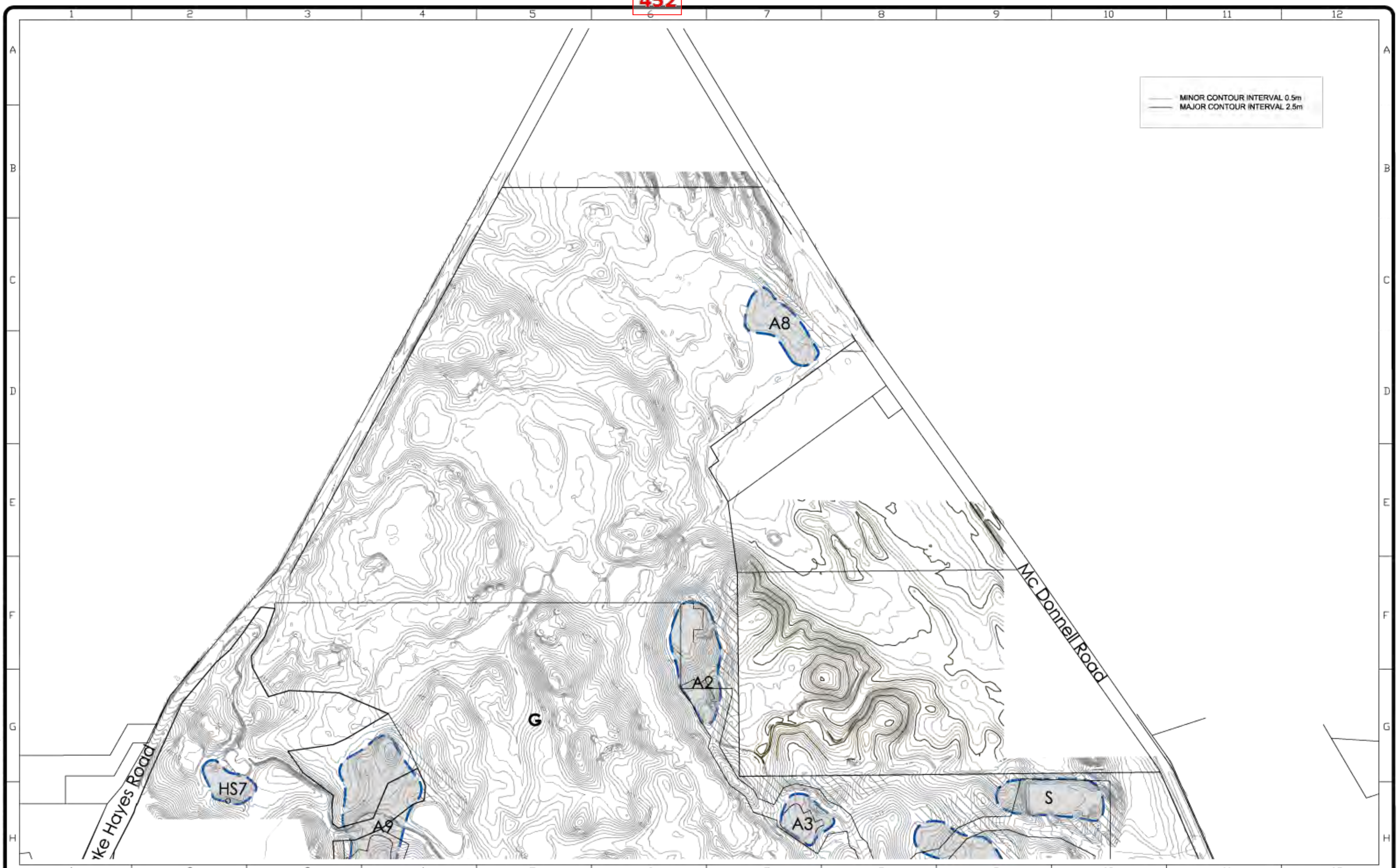

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Issue	Description	By	Date
A	Preliminary Issue	JWPH	20.10.15

Project: NATURAL HAZARD ASSESSMENT

Title: ACTIVITY AREA PLAN 1

Client: TROJAN HELMET LTD

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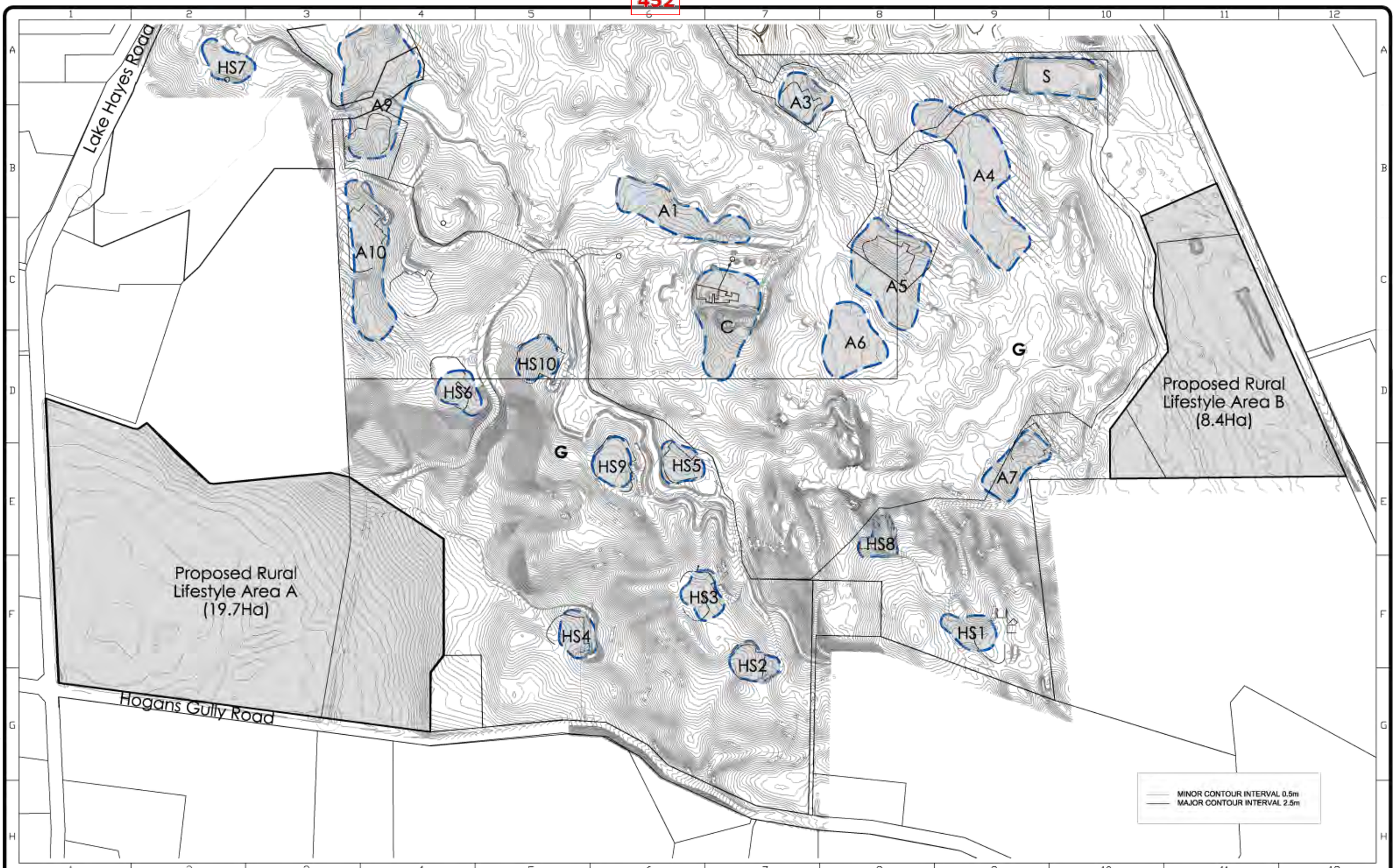

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Notes:	Issue	Description	By	Date
	A	Preliminary Issue	JWPH	20.10.15

Project: NATURAL HAZARD ASSESSMENT

Title: ACTIVITY AREA PLAN 2

Client: TROJAN HELMET LTD

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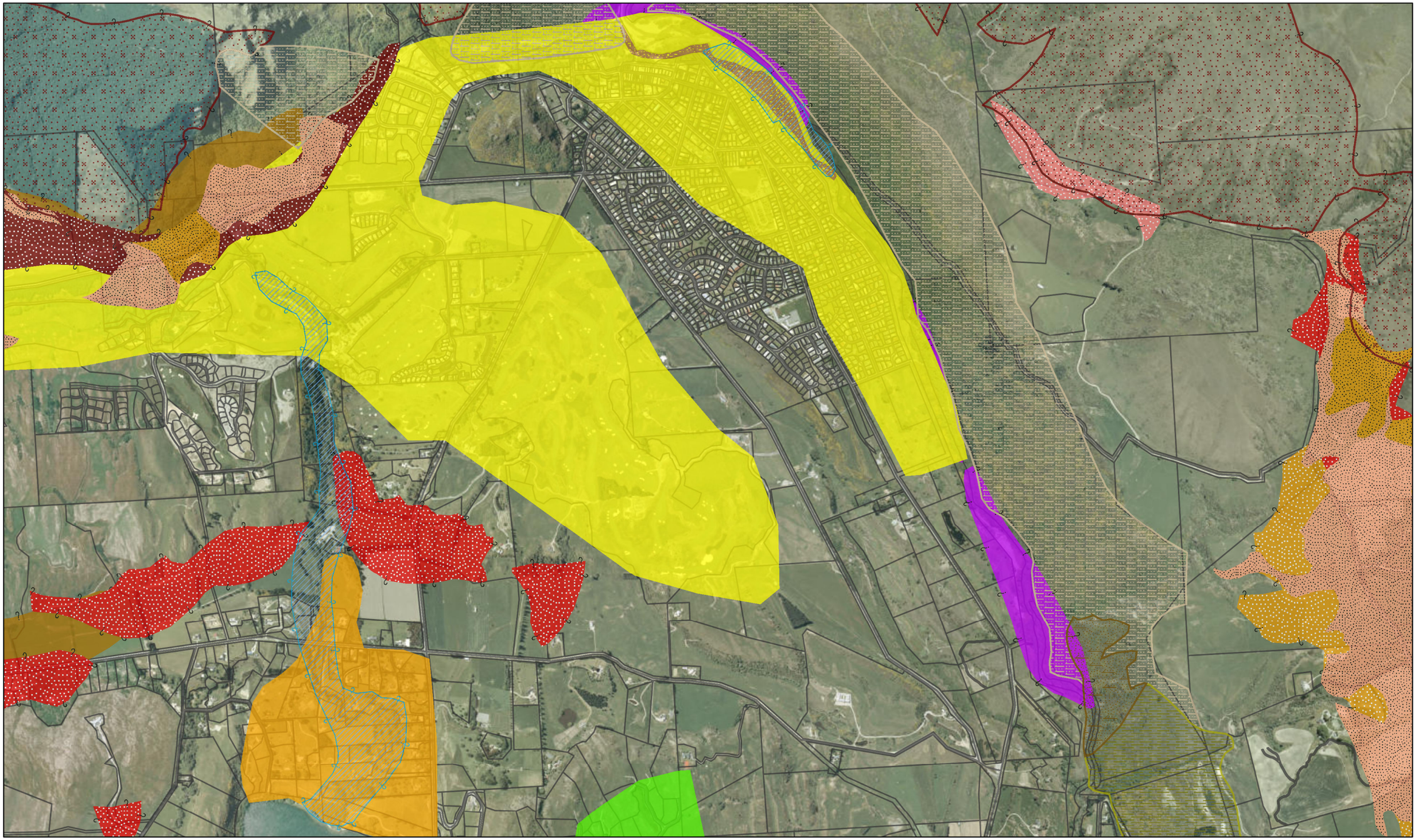
Appendix B

QLDC Hazard Maps



Queenstown Lakes District Council

Webmaps your view of your information

The Hills

19 October 2015

0 0.15 0.3 0.45 0.6 Kilometres

N

The Hills

Legend

Property Land

Parcel Boundaries

Property Address

Roads

Hazards

Active Fault - Location approximate

Inactive Fault - Location approximate

Flooding due to Rainfall

Flooding due to Damburst

Landslide: Active Pre-existing Schist Debris Landslides

Landslide: Pre-existing Schist Debris Landslides (Activity Unknown)

Landslide: Dormant Pre-existing Schist Debris Landslides

Landslide: Shallow Slips and Debris Flows in Colluvium

Landslide: Debris Flow Hazards

Landslide: Slope Failure Hazard in Superficial Deposits

Landslide: Rockfall

Landslide: Pre-existing or Potential Failure in Lake Sediments or Tertiary Sediments

Landslide: Piping potential in the Artesian Zone of the Wanaka Aquifer

Landslide: Potential Hazard - Debris Flood/Debris Flow

Landslide Areas - non verified

Erosion Areas

Alluvial Fan - Incision Line

Alluvial Fan - Channels

Alluvial Fan - Source Area

Alluvial Fan - Catchment Areas

Alluvial Fan - Hazard Area

Alluvial Fan - ORC: fan active bed

Alluvial Fan - ORC: fan recently active

Alluvial Fan - ORC: fan less recently active

Alluvial Fan (Regional scale) Active, Composite

Alluvial Fan (Regional scale) Active, Debris-dominated

Alluvial Fan (Regional scale) Active, Floodwater-dominated

Alluvial Fan (Regional scale) Inactive, Composite

Alluvial Fan (Regional scale) Inactive, Debris-dominated

Alluvial Fan (Regional scale) Inactive, Floodwater-dominated

Avalanche Areas

Liquefaction Risk: Nil to Low (T&T 2012)

Liquefaction Risk: Probably Low (T&T 2012)

Liquefaction Risk: Possibly Moderate (T&T 2012)

Liquefaction Risk: Possibly High (T&T 2012)

Liquefaction Risk: Possibly Susceptible (Opus 2002)

Liquefaction Risk: Susceptible (Opus 2002)

Appendix C

Figure 2

KEY:

Structure Plan Boundary

Activity Area

Activity Areas:

G:	Golf course, open space and farming
C:	Clubhouse
A:	Visitor Accommodation / Residential
HS:	Homesite (3,000m2)
F:	Farm
S:	Resort Services & Staff Accommodation

Note: all activity areas include G: Golf course, open space and farming

Overlays:

Landscape Protection Area

The Hills Structure Plan - Yield Schedule
Sep-10

Activity Area	Size	Density (unit/Ha)		Lots	
		Low	High	Low	High
A1	0.9 Ha	1	8	1	7
A2	0.9 Ha	1	8	1	7
A3	0.4 Ha	1	8	1	3
A4	1.7 Ha	1	8	1	13
A5	1.2 Ha	1	8	1	10
A6	0.7 Ha	1	8	1	5
A7	0.5 Ha	1	8	1	4
A8	0.6 Ha	1	4	1	2
A9	1.7 Ha	1	8	1	13
A10	1.1 Ha	1	8	1	8
		Subtotal		10	74
H1	0.3 Ha			1	1
H2	0.3 Ha			1	1
H3	0.3 Ha			1	1
H4	0.3 Ha			1	1
H5	0.3 Ha			1	1
H6	0.3 Ha			1	1
H7	0.3 Ha			1	1
H8	0.2 Ha			1	1
H9	0.3 Ha			1	1
H10	0.3 Ha			1	1
		Subtotal		10	10
		Total		20	84
Total Structure Plan Area	162.7 Ha				
Ave. Lot size (per total land area)				8.1 Ha	1.9 Ha

FOR DISCUSSION

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SCALE: 1:4,000 (A1); 1:8,000 (A3)

PLAN STATUS:
DRAFT

Fig. 2

QLDC hazard zonations. Depiction of liquefaction and alluvial fan hazards at site.

Liquefaction risk. Probably low

Alluvial fan. Active. Debris dominated.

THE HILLS
STRUCTURE PLAN

DRAWN / REVIEWED: RT / JC
APPROVED: DT
DATE: 14.09.15

DRAWING NO:
MH_10_1_MLP_010E

Appendix D

Figure 10

452

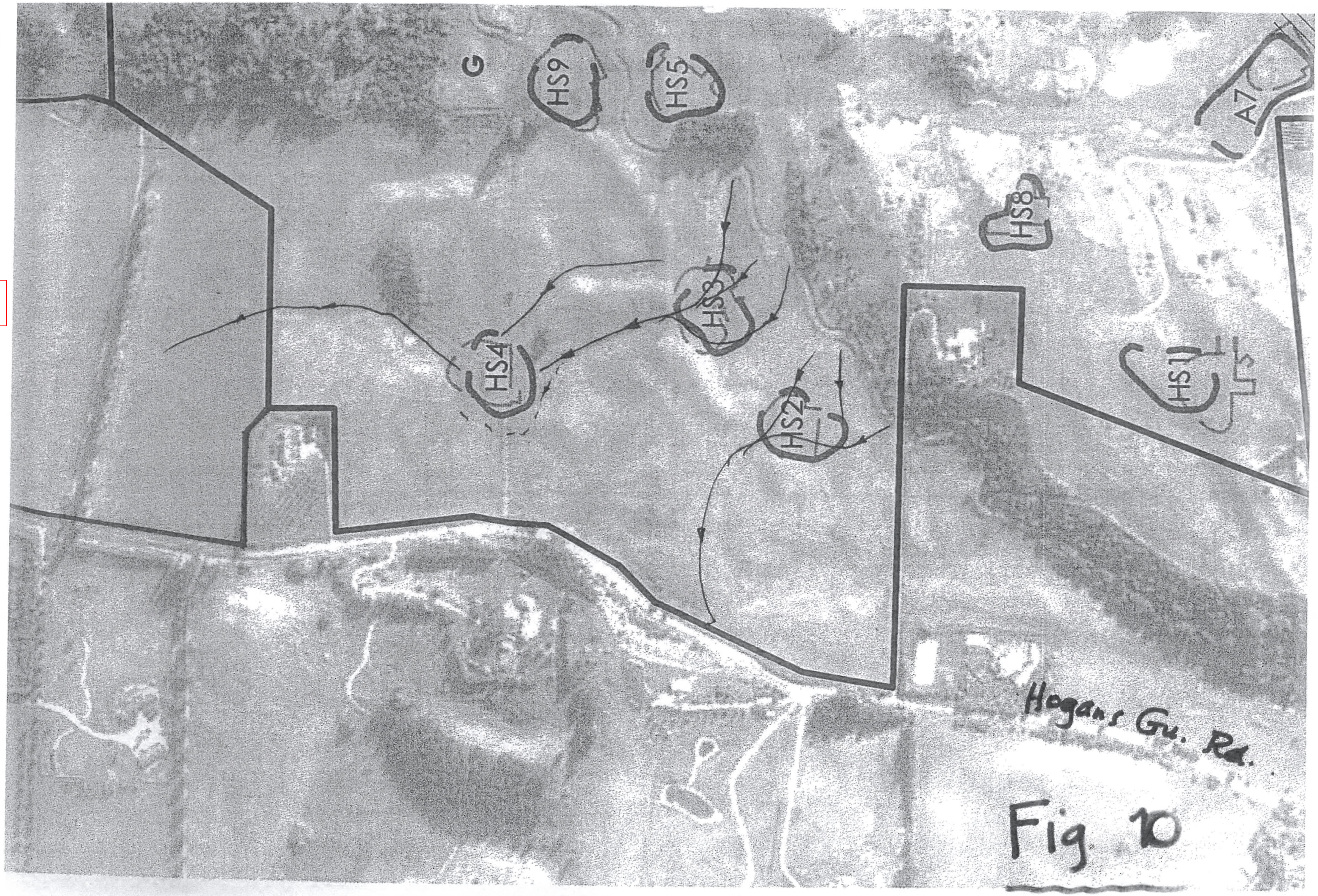

Fig 10

Rezoning Submission to the District Plan, Preliminary and Detailed Site Investigation

For

Trojan Helmet Ltd

October 2015

Davis Consulting Group Limited
Arrow Lane,
Arrowtown 9302
03 409 8664
Document ID: 15063B

Rezoning Submission to the District Plan,

Preliminary and Detailed Site Investigation

Document Status

Version	Purpose of Document	Prepared By	Reviewer	Review Date
A	Draft for Internal Review	FR	GD	19 Oct 2015
B	FINAL for Client Review	FR	GD	20 Oct 2015
O	Final Report	FR	GD	22 Oct 2015

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EXECUTIVE SUMMARY

Trojan Helmet Limited (THL) has prepared a submission to the district plan that seeks to rezone a parcel of land on Lake Hayes Arrowtown Road from the current rural general zone to rural lifestyle. The proposed site has had a long history of pastoral activity that may have received applications of pesticides and fertilisers. The proposal would result in subdivision, landuse change and earthwork activities that trigger the National Environment Standard for Assessing and Managing Contaminants in Soil (NES).

In order to support the submission, THL commissioned Davis Consulting Group to consider the potential effect of historical activities on the soil quality of the site and undertake a review of risks to human health to meet the provisions of the NES.

The scope of work completed during the Preliminary and Detailed Site Investigation (PSI and DSI) included the following:

- Review of the site history including a review of the property file, certificate of title and historic aerial photographs;
- Completion of a site inspection to examine the condition of the property;
- Collection of soil samples across the site and analysis for heavy metals and organochlorine pesticides; and
- Consideration of the risk to human health based on the detected soil contaminant concentrations and proposed landuse of the site.

Based on the findings of the PSI and DSI, the following conclusions are made:

- The THL submission seeks to rezone the site from rural general to a rural lifestyle zoning;
- A review of the historical and current landuse of the site identified a range of potentially hazardous activities that could have impacted soil quality including the broad acre application of pesticides and fertilisers and storage of waste oil. A range of farming materials such as timber, wire and railway sleepers are also stored on the site however we concluded these activities have been for a short duration and unlikely to impact soil quality;
- DCG concluded the risk to soil quality on the site is associated with the possible historical application of the pesticides and fertilisers;
- Soil sampling was undertaken across the site to support the assessment with a total of 15 soil samples collected;

- The soil samples were analysed for organochlorine pesticides and heavy metals that are associated with the broad acre application of pesticides and fertilisers;
- The analytical results show that the DDT was historically utilised on the site but was detected at concentrations well below the risk based NES soil contaminant standard; and
- Most of the heavy metal results returned concentrations that are considered to represent background levels however arsenic was detected on one of the composite soil samples that exceeds the NES soil contaminant standards.

In summary, most of the site is suitable for activities that may be undertaken under the proposed rural lifestyle zoning however some additional investigation is required to assess the extent of the soils that contain arsenic exceeding the adopted guideline. DCG considers the impacted area will be relatively small and localised and readily remediated if necessary.

1.0 INTRODUCTION

1.1 Purpose

Trojan Helmet Limited (THL) has prepared a submission to the district plan that seeks to rezone a parcel of land on Lake Hayes Arrowtown Road from the current rural general zone to rural lifestyle. The proposed site has had a long history of pastoral activity that may have received applications of pesticides and fertilisers. The proposal would result in subdivision, landuse change and earthworks activities that may trigger the National Environment Standard for Assessing and Managing Contaminants in Soil (NES).

In order to support the submission, THL commissioned Davis Consulting Group to consider the potential effect of historical activities on the soil quality of the site and undertake a review of risks to human health to meet the provisions of the NES.

DCG's experience in the provision of contaminated land services is provided in Appendix A.

1.2 Scope of Work

The scope of work completed during the Preliminary and Detailed Site Investigation (PSI and DSI) included the following:

- Review of the site history including a review of the property file, certificate of title and historic aerial photographs;
- Completion of a site inspection to examine the condition of the property;
- Collection of soil samples across the site and analysis for heavy metals and organochlorine pesticides;
- Consideration of the risk to human health based on the detected soil contaminant concentrations and proposed landuse of the site; and
- Preparation of a soil investigation report in accordance with the requirements of the Contaminated Land Management Guidelines (CLMG) No. 1.

1.3 Limitations

The findings of this report are based on the Scope of Work outlined above. DCG performed the services in a manner consistent with the normal level of care and expertise exercised by members of the environmental science profession. No warranties, express or implied, are made. Subject to the Scope of Work, DCG's assessment is limited strictly to identifying the risk to human health based on the historical activities on the site. The confidence in the findings is limited by the Scope of Work.

The results of this assessment are based upon site inspections conducted by DCG personnel, information from interviews with people who have knowledge of site conditions. All conclusions and recommendations regarding the properties are the professional opinions of DCG personnel involved with the project, subject to the qualifications made above. While normal assessments of data reliability have been made, DCG assumes no responsibility or liability for errors in any data obtained from regulatory agencies, statements from sources outside DCG, or developments resulting from situations outside the scope of this project.

2.0 SITE LOCATION AND DESCRIPTION

2.1 Site Location and Description of the Activity

The site is located on the corner of Arrowtown Lake Hayes Road and Hogans Gully Road and has the following legal description Lot 6 DP 392663 Lot 4 DP 392663 (see Figure 1). THL are seeking to change the land use of Lot 6 DP 392663 and 4.7 ha of Lot 4 DP 392663. The total area of the site is approximately 19.7 ha and is situated southwest of Arrowtown. Figure 2 presents the layout of the proposed activity contained within the THL submission.

According to the Queenstown Lakes District Council (QLDC) District Plan, the property lies within the Rural General Zone.

Coordinates for the property are E 2180439, N 5574691.

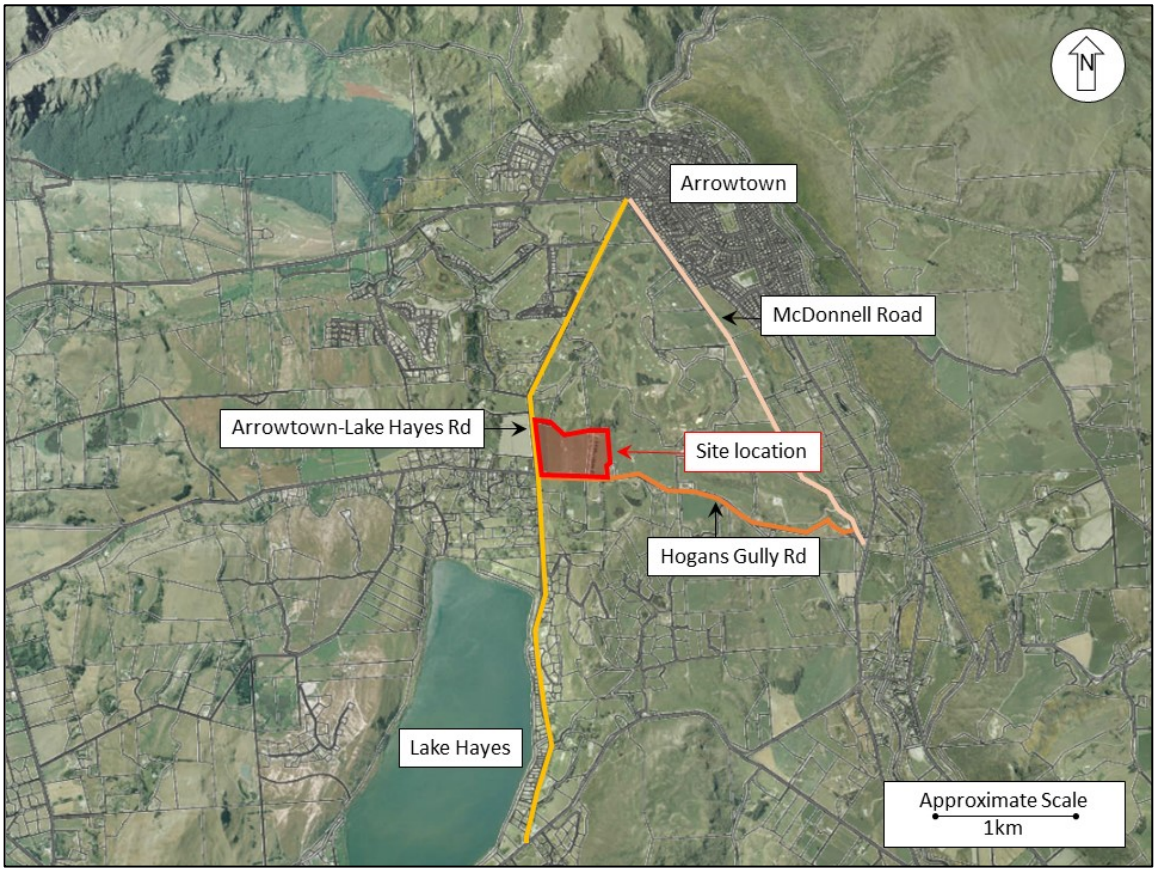

Figure 1: Site Location Plan

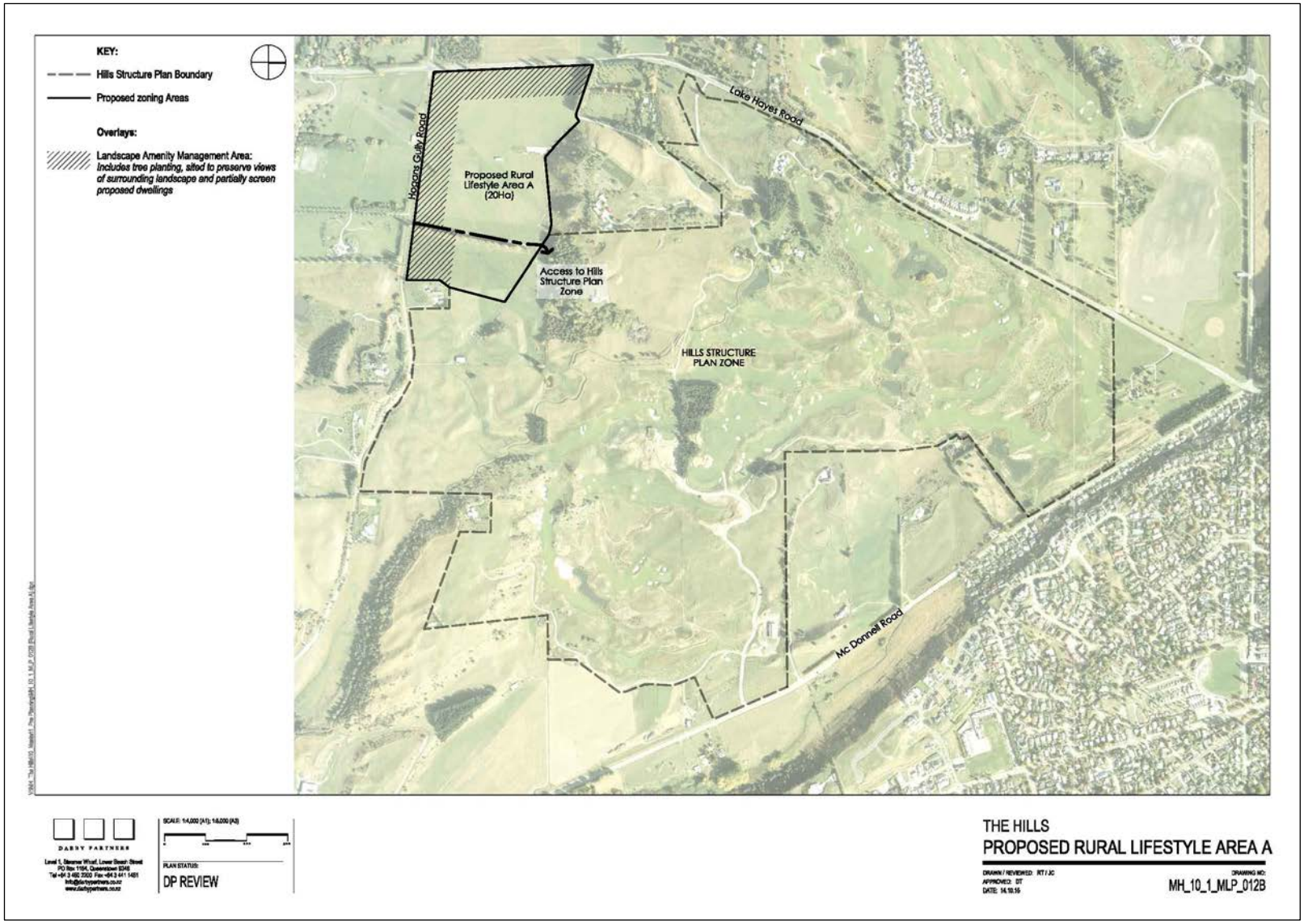

Figure 2: Proposed Rural Lifestyle Area A – Prepared by Darby Partners

2.2 Site History

Historic photographs obtained from the Lakes District Museum (accessed 15/10/2015) indicate the property was used for pastoral activity from circa 1910 (see Plate 1). A second historical photograph taken in 1954 (see Plate 2) indicates the area continued to be under pastoral management at this time.

DCG understands the site was part of the Bob Jenkins Farm in the 1930s. The property was subsequently purchased in the 1940s by brothers Jack and Lawson Summer who then sold it on to Jim Monk (McDonald, 2010). The current owners, Trojan Helmet Limited, purchased the property in circa 1992 and the site has been used for grazing since this time. Historic title for the site is located in Appendix B.

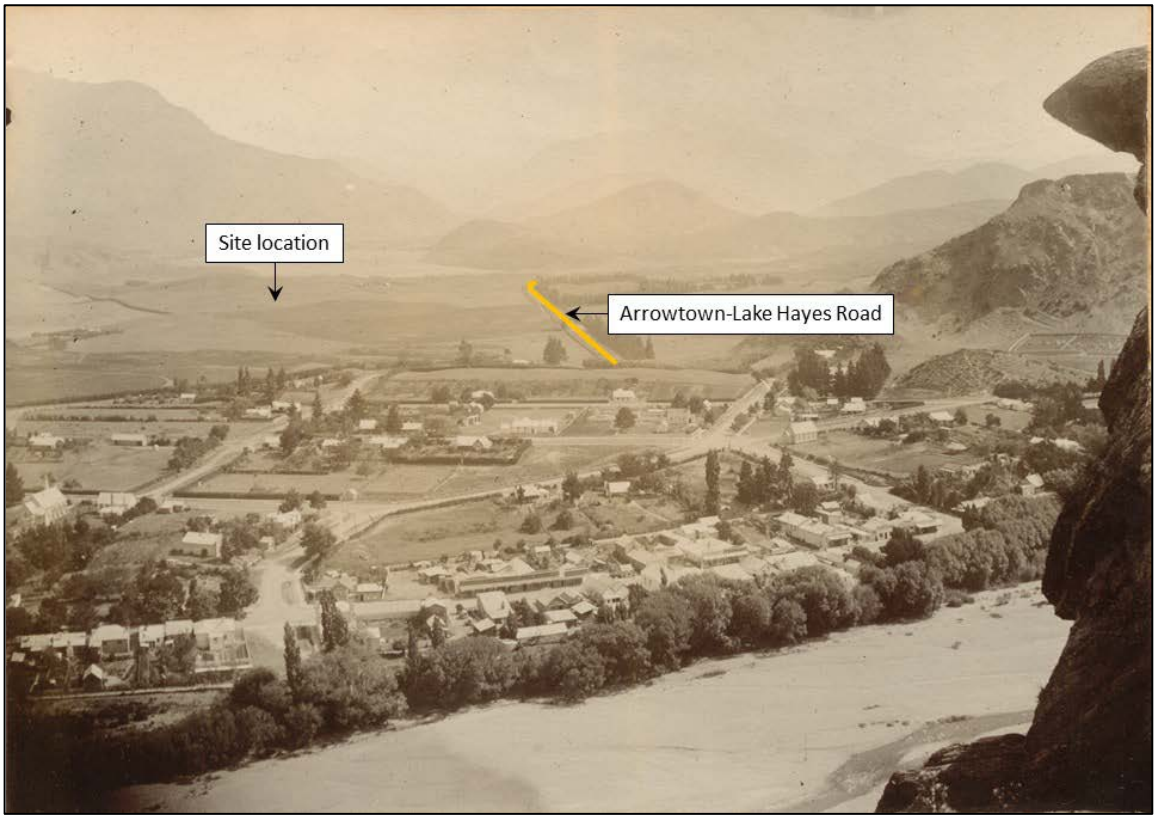

Plate 1: Looking southwest over Arrowtown towards Lake Hayes 1910

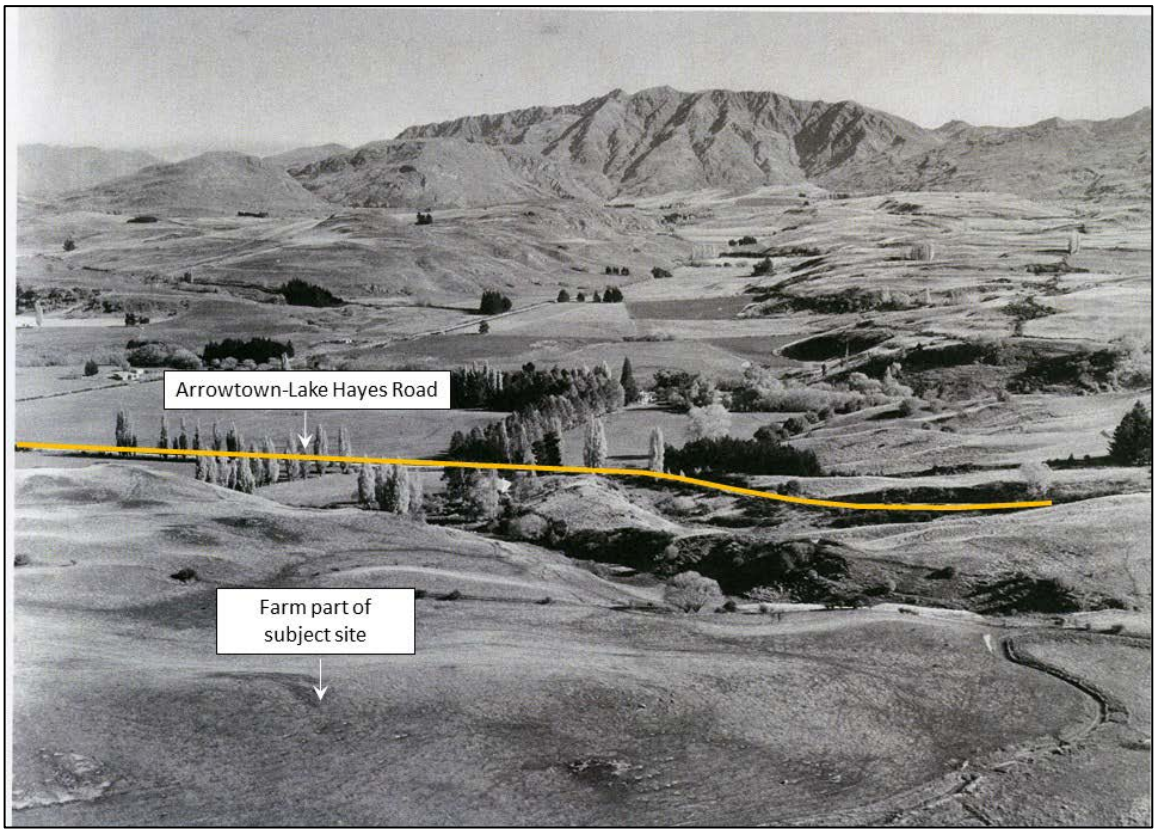

Plate 2: Looking West from above The Hills site 1954

2.3 Site Condition and Surrounding Environment

Figure 3 presents a site plan showing the current layout of the site.

The site contains a storage area where the following items are stored: Railway sleepers, plastic hosing, some light machinery, waste oil drums, deer fence netting, corrugated iron, timber, pellets, baleage and logs. The surface soil within this area did not look stained or impacted from storing the above items.

The hay shed currently stores some hay and shelters one empty waste oil can and a caravan. The remainder of the site includes a gravel track, a drain and pasture. Plates 3-6 provide representative photographs for the layout and current condition of the site.

According to the QLDC Webmaps (http://maps.qldc.govt.nz/qldcviewer/) the property is currently zoned rural general along with properties to the north and east. Neighbouring to the west is rural general and rural residential and to the south is rural lifestyle. The site borders an active alluvial fan to the east and northwest (QLDC Webmaps).

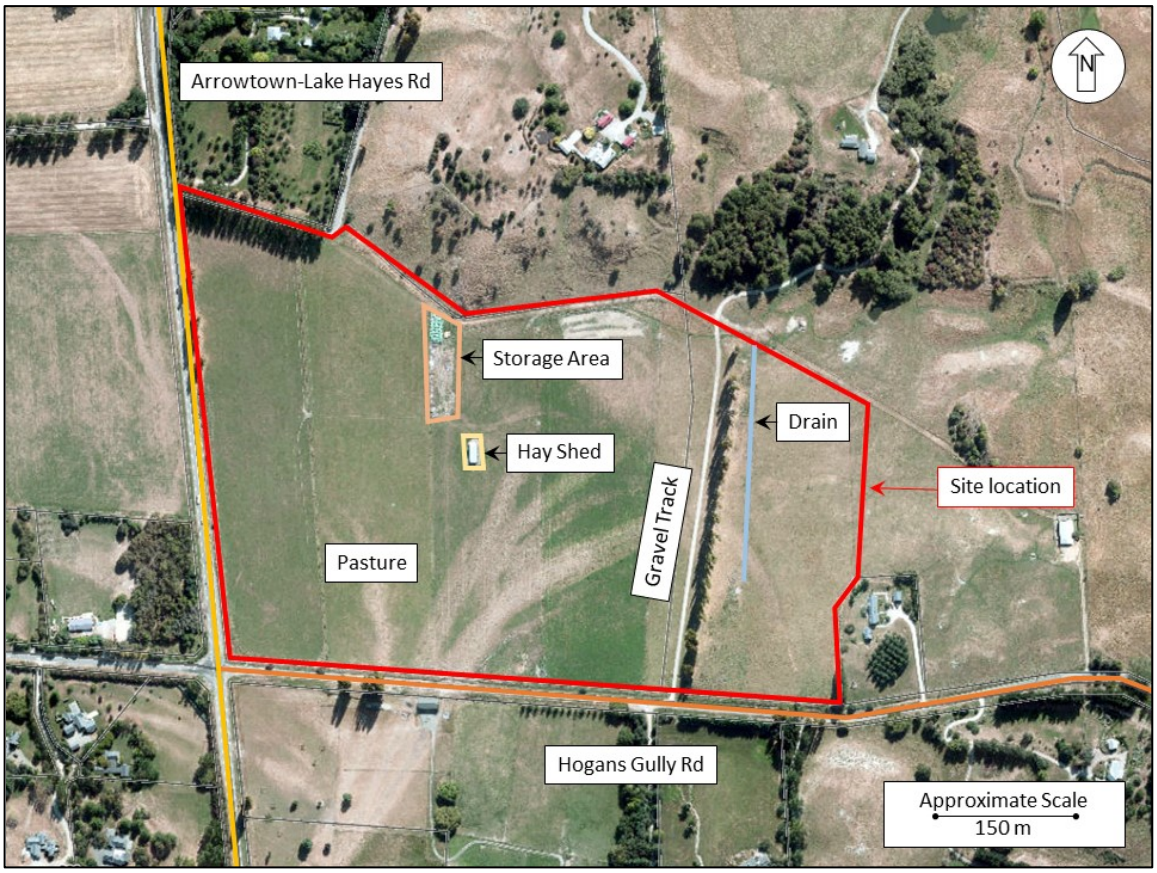

Figure 3: Site Layout Plan

Plate 3: Timber, logs and railway sleepers at the storage area

Plate 4: Fencing wire, corrugated iron, timber and baleage at the storage area

Plate 5: Waste oil drums at the storage area

Plate 6: Looking south from centre of site across pasture

2.4 Geology and Hydrogeology

The site is situated on a glacial till (Turnbull, 2000). According to the QLDC Webmap, the site borders an active alluvial fan. The surface soils were described during the collection of soil samples; see Appendix C for the soil profile logs.

2.4.1 Hydrogeology

The site investigation did not include a groundwater assessment. The site is located within the Wakatipu Basin aquifer system however it is not situated above any identified aquifers. The Mid Mill Creek Aquifer is situated east the subject site and north of Lake Hayes (ORC, 2014). The depth to groundwater on the site is unknown.

The location of groundwater bores within a 1 kilometre radius of the site (held by the ORC) is provided in Appendix D. A total of 12 consented bores have been installed within 1 km of the site. The wells have been installed for a variety of purposes and are summarised as follows:

- 7 wells are used for domestic purposes;
- 2 well is disused;
- 2 well is unknown; and
- 1 wells are used for geological investigation.

2.4.2 Hydrology

On site there is one drain which during the site visit contained water. The closest surface water is Mill Creek located 50 m west of the site.

2.5 Additional Site Information

The CLMG No 1 requires information associated with fuel storage facilities, spill loss history, recorded discharges and onsite and offsite disposal locations. DCG requested a search of the Otago Regional Council (ORC) records, and examined the Queenstown Lakes District Council (QLDC) records, for Landuse and Site Contamination Status, Resource Consents, and Resource Management Act (RMA) incidents for the site. The ORC stated the following.

There are no records held on the Otago Regional Council's "Database of Selected Landuses" for the above site. The database identifies sites where activities have occurred that are known to have the potential to contaminate land. The record of a property in the database does not necessarily imply contamination. Similarly, the absence of available information does not necessarily mean that the property is uncontaminated; rather no information exists on the database.

Reference should be made to the Ministry for the Environment's Hazardous Activities and Industries List. If any of these activities have occurred on the above site, then it may be considered potentially contaminated.

Property files were obtained from the QLDC eDocs webpage (https://edocs.qldc.govt.nz/) for Lots 6 and 4 DP 392663. The property file held information regarding applications for a billboard on the corner of Lake Hayes and Hogans Gully Roads and a consent to undertake a subdivision and identification of building platform, a boundary adjustment to create a 4ha lot around an existing dwelling and landuse consent to construct a new dwelling. Both applications are dated 2015.

The following provides a summary of information that the CLMG No. 1 (MfE, 2003a) indicates should be included in a DSI report:

- Presence of Drums – Two waste oil drums were located in the storage area of the site (see Plate 5). The drums were full of oil. The drums appeared to be in good condition and were not leaking.
- Wastes – waste oil is stored on the site as described above.
- Fill Materials – No fill material was present on site.
- Odours – No odours were noted.

- Flood Risk – According to QLDC Hazard map the site is not at risk of flooding;
- Surface Water Quality – There was a small drain with water flowing from the northern neighbouring lot to the south.
- Site boundary condition – The west, north and southern boundaries are deer fenced. The eastern boundary is not fenced or marked.
- Visible Signs of Contamination – No obvious stains or signs of contamination were present during the site visit.
- Local Sensitive Environments –The closest sensitive environment is Mill Creek located 50 m west of the property boundary.

2.6 Contaminants Commonly Associated with the Landuse

Based on the Contaminated Land Management Guidelines Schedule B, the hazardous substances that may be associated with the farming activity include a range of organochlorine pesticides and heavy metals. In addition waste oil is stored on a pellet and there is a risk of some loss of waste oil to ground however there was no evidence of staining of soils. We therefore concluded it was highly unlikely there has been losses of waste oil to ground.

It is our view that the contaminants of concern across the site are predominantly those associated with historic farming and agriculture landuse. Specifically, the broad acre application of persistent pesticides and fertilisers has the potential for organochlorine pesticides and heavy metals to accumulate in soils to a level that may present a risk to human health.

3.0 SAMPLING AND ANALYSIS PLAN

3.1 Data Quality Objectives

The data quality objectives (DQOs) of the DSI were to:

- Characterise the nature of any contamination associated with the historical landuse of the site; and
- Determine the risk of any soil contamination encountered onsite to human health, based on the proposed rural lifestyle landuse of the site.

3.2 Sampling and Analysis Plan

The sampling and analysis plan was designed to address the specific objectives, namely gain an understanding of contaminants associated with historic farming and pesticide use. The sampling approach was systematic using a 70 m by 70 m grid. Note that the 'Landscape Protection Area' was not sampled. Samples were also not collected within the storage area as it is highly unlikely the materials stored on the site would have impacted the soil quality.

The sampling plan is presented in Figure 4. The sample IDs and coordinates are provided on the soil descriptions (Appendix C).

Soil samples were composited into groups of three for the analysis of heavy metals. From each set of three samples one sample was analysed for organochlorine pesticides. A total of 15 surface soil samples were collected on site from 0 – 10 cm depth, with a further sample also taken for duplicate purposes. The sampling depth was considered appropriate due to the nature of the potential contaminants present such as pesticides and heavy metals, which generally bind strongly to soils. Furthermore, the risk of exposure to people working and living on the site is associated with surface soils.

The soil sample and analysis summary table is located below in Table 1.

Table 1: Soil Sample Summary Table

Sample ID	Sample Depth	Heavy Metals Composite
AA#1	0-0.1	1
AA#2	0-0.1	
AA#3	0-0.1	
AA#4	0-0.1	2
AA#5	0-0.1	
AA#6	0-0.1	
AA#7	0-0.1	3
AA#8	0-0.1	
AA#9	0-0.1	
AA#10	0-0.1	4
AA#11	0-0.1	
AA#12	0-0.1	
AA#13	0-0.1	5
AA#14	0-0.1	
AA#15	0-0.1	
Sample ID	Sample Depth	Individual Analysis
AA#2	0-0.1	Organochlorine Pesticides
AA#5	0-0.1	Organochlorine Pesticides
AA#8	0-0.1	Organochlorine Pesticides
AA#11	0-0.1	Organochlorine Pesticides
AA#14	0-0.1	Organochlorine Pesticides
A Dup #1	0-0.1	Heavy Metals
AA#4	0-0.1	Heavy Metals

Figure 4: Sample Location Plan

3.3 Soil Sampling Methodology

Soil sampling was undertaken with the use of a spade. The following procedures were applied during the soil sampling process to gain representative samples:

- Field personnel wore a fresh pair of nitrile gloves between sampling events.
- Soil samples were transferred to 250 mL glass jars with teflon lids as supplied by Hill Laboratories.
- All soil samples were unambiguously marked in a clear and durable manner to permit clear identification of all samples in the laboratory.

3.4 Analytical Parameters

The laboratory analytical suite determined for the site investigation is in recognition of our understanding of the current and historical use of the subject site. DCG understands the site has had a history of agricultural activity. Based on these activities the following substances were included in the analytical suite:

- Organochlorine pesticides (including 4,4-DDE, 2,4-DDT and Dieldrin);
- Heavy metals.

The laboratory methods utilised for the analysis are provided in the laboratory report (see Appendix E).

3.5 Soil Sample Field and Laboratory QA/QC

The field QA/QC procedures performed during the soil sampling are listed as follows:

- Use of standardised field sampling forms and methods;
- Samples were transferred under chain of custody procedures;
- All samples were labelled to show point of collection, project number, and date;
- Headspace in sample jars was avoided;
- The threads on the sampling jars were cleaned to avoid Volatile Organic Compound (VOC) loss;

All soil samples were couriered on ice to Hill Laboratories. Hill Laboratories is IANZ accredited for the analysis of heavy metals and pesticides. Hill conduct internal QA/QC in accordance with IANZ requirements.

3.6 Soil Guideline Values

Soil guideline values (SGVs) selected for application on this project are provided in Table 2. The selection of these guidelines is consistent with the principles of the Contaminated Land Management Guidelines No. 2: Hierarchy and Application in New Zealand of Environmental Guideline Values (MfE, 2003b).

The heavy metal and organochlorine pesticide SGVs adopted for the site assessment were based on either the NES Soil Contaminant Standards (MfE, 2012) or the National Environmental Protection Measure (NEPM, 2013). Guidelines for the rural residential and residential landuse scenarios as set out in the NES were adopted for the house sites and residential activity areas respectively.

Table 2: Soil Guidelines

Analyses	Guideline
Heavy Metals and Organochlorine and Multi-residue pesticides	1. Soil Contaminant Standards *in* New Zealand 'Users' Guide: NES for Assessing & Managing Contaminants in Soil to Protect Human Health 2012 (MfE, 2012). 2. Guideline on the Investigation Levels for Soil and Groundwater *in* National Environment Protection (Assessment of Site Contamination) Measure 1999 - Volume # 2 (NEPC, 2013).

3.7 Soil Analytical Result Review

Following the receipt of laboratory data, a detailed review of the data was performed to determine its accuracy and validity. All laboratory data was checked for analytical and typographical errors.

Once the data quality was established the soil data was checked against the Sampling Program DQOs.

4.0 INVESTIGATION RESULTS

4.1 Analytical Results

The soil sample locations are provided in Figure 4 and summarised in Appendix E.

4.1.1 Organochlorine Pesticides Results

The organochlorine pesticides (OCP) detected above the laboratory detection limit are provided in Table 3. The remaining results are presented in the laboratory reports provided in Appendix E. In summary the OCP analytical results show the following:

- DDT was detected in four of the five soil samples analysed ranging from 0.096 mg/kg to 0.257 mg/kg;
- All DDT concentrations detected are well below the NES soil contaminant standard for the rural residential landuse scenario of 45 mg/kg; and
- All other OCP results returned concentrations below the laboratory reporting limit.

The results indicate that DDT has been utilised across the property, most likely to control pests such as grass grub. Notwithstanding this finding, the concentrations are well below levels that present a risk to people working or living on the site.

Table 3: Organochlorine Pesticide Results (mg/kg)

Sample ID	AA#2 (0.1)	AA#5 (0.1)	AA#8 (0.1)	AA#11 (0.1)	AA#14 (0.1)	Guideline
2,4'-DDD	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-
4,4'-DDD	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-
2,4'-DDE	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	-
4,4'-DDE	0.138	0.15	0.073	0.043	< 0.010	-
2,4'-DDT	< 0.010	0.011	< 0.010	< 0.010	< 0.010	-
4,4'-DDT	0.06	0.066	0.018	0.013	< 0.010	-
Total DDT	0.238	0.257	0.131	0.096	<0.06	45[1]

< denotes concentration below laboratory detection limits
- Denotes no guideline value
[1] Appendix B Soil Contaminant Standards in New Zealand 'Users' Guide: NES for Assessing & Managing Contaminants in Soil to Protect Human Health 2012 (MfE, 2012).

4.1.2 Heavy Metal Results

The heavy metal results are presented in Table 4 and summarised as follows:

- Arsenic concentrations detected in the composite soil samples ranged from 8 mg/kg to 22 mg/kg;
- Arsenic concentrations were detected below the adopted NES soil contaminant standard in four of the five soil samples analysed;
- An arsenic concentration of 22 mg/kg was detected in Composite Sample #2 that exceeds the adopted NES soil contaminant standard; and
- Cadmium, chromium, copper, lead, nickel and zinc concentrations were all detected below the adopted rural residential soil guidelines.

The consistency of the results indicates that most of the heavy metal concentrations are representative of background concentrations. However, Composite Sample #2 contained arsenic levels that are elevated above background and also the soil contaminant standard. DCG expects the concentration detected to be representative of a relatively localised hotspot that may be the result of the storage of treated timber posts. Further investigation to delineate the extent of the impacted soil will be required prior to lodgement of a landuse consent to ensure the risk to human health is characterised appropriately.

Table 4: Heavy Metal Composite Results (mg/kg)

Composite #	1	2	3	4	5	Guideline
Arsenic	12	**22**	12	10	8	17[1]
Cadmium	0.17	0.22	0.14	0.13	0.2	0.8[1]
Chromium	13	13	10	11	11	>10,000[1]
Copper	18	18	11	11	15	>10,000[1]
Lead	18.2	21	14.8	12.7	12.5	160[1]
Nickel	14	14	10	10	11	400[2]
Zinc	71	74	51	55	58	7,400[2]

< denotes concentration below laboratory detection limits
[1] Appendix B Soil Contaminant Standards in New Zealand 'Users' Guide: NES for Assessing & Managing Contaminants in Soil to Protect Human Health 2012 (MfE, 2012).
[2] Schedule B (1) Guideline on the Investigation Levels for Soil and Groundwater in National Environment Protection (Assessment o Site Contamination) Measure 2013 Volume 2 (NEPC, 2013).

4.2 QA/QC Results

4.2.1 Field Duplicates

One field duplicate soil sample was collected during the site investigation and analysed to review the reproducibility of the laboratory analysis. The duplicate and the corresponding sample results are presented in Table 5 below.

Table 5: Duplicate Percentage Differences

Sample ID	AA#4 (0.1)	A Dup #1	% Difference
Arsenic	9	10	10.50%
Cadmium	0.17	0.15	1%
Chromium	9	9	0%
Copper	13	13	0%
Lead	16.2	16.6	2.40%
Nickel	8	8	0%
Zinc	53	55	3.80%

An acceptable percentage difference between duplication samples is less than 30 to 50 % (MfE, 2011). The highest relative percentage difference between the six samples was 10.5 % (for arsenic), which is considered acceptable for soil analysis. The QA/QC analysis indicates the sampling and analysis undertaken was reproducible.

4.2.2 Laboratory Procedures

Hills Laboratories did not complete specific in-house QA/QC analysis such as spike recoveries or laboratory duplicates during the processing of the soil samples.

The Chain of Custody form and the Hills Laboratory results are provided in Appendix E.

5.0 SUMMARY AND RECOMMENDATIONS

Based on the findings of the PSI and DSI, the following conclusions are made:

- The THL submission seeks to rezone the site from rural general to a rural lifestyle zoning;
- A review of the historical and current landuse of the site identified a range of potentially hazardous activities that could have impacted soil quality including the broad acre application of pesticides and fertilisers and storage of waste oil. A range of farming materials such as timber, wire and railway sleepers are also stored on the site however we concluded these activities have been for a short duration and unlikely to impact soil quality;
- DCG concluded the risk to soil quality on the site is associated with the possible historical application of the pesticides and fertilisers;
- Soil sampling was undertaken across the site to support the assessment with a total of 15 soil samples collected;
- The soil samples were analysed for organochlorine pesticides and heavy metals that are associated with the broad acre application of pesticides and fertilisers;
- The analytical results show that the DDT was historically utilised on the site but was detected at concentrations well below the risk based NES soil contaminant standard; and
- Most of the heavy metal results returned concentrations that are considered to represent background levels however arsenic was detected on one of the composite soil samples that exceeds the NES soil contaminant standards.

In summary, most of the site is suitable for activities that may be undertaken under the proposed rural lifestyle zoning however some additional investigation is required to assess the extent of the soils that contain arsenic exceeding the adopted guideline. DCG considers the impacted area will be relatively small and localised and readily remediated if necessary.

6.0 REFERENCES

Ministry for the Environment (2003a) *Contaminated Land Management Guidelines No. 1: Reporting on Contaminated Sites in New Zealand.*

Ministry for the Environment (2003b) *Contaminated Land Management Guidelines No. 2: Hierarchy and Application in New Zealand of Environmental Guideline Values.*

Ministry for the Environment (2011) *Contaminated Land Management Guidelines No. 5: Site investigation and analysis of soils. Revised 2011.*

Ministry for the Environment (2012) *Users' Guide: National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health*. Wellington: Ministry for the Environment.

National Environment Protection Council (NEPC) (1999) *National Environment Protection (Assessment of Site Contamination) Measure - Schedule B (1) Guideline on Investigation Levels for Soil and Groundwater.* National Environment Protection Council.

Otago Regional Council (ORC), 2014. *Investigation into the Wakatipu Basin Aquifers, July 2014.* Report writer: Jens Rekker, Resource Scientist. Reviewed by: John Threlfall, Director of Environmental Science & Information.

Turnbull, I.M. (compiler) 2000. *Geology of the Wakatipu area.* Institute of Geological & Nuclear Sciences 1:250 000 geological map 18. 1 sheet + 72 p. Lower Hutt, New Zealand. Institute of Geological & Nuclear Sciences Limited

Queenstown Lakes District Council, 2009. *Queenstown Lakes District Plan*.

Lakes District Museum, 2015. Accessed 15/10/15

Appendices

Appendix A

Davis Consulting Group Contaminated Land Experience

Davis Consulting Group Contaminated Land Experience

Glenn Davis is the director of Davis Consulting Group and has over 15 years post graduate experience working as an Environmental Scientist. Glenn has accumulated a significant volume of work experience in the contaminated land field undertaking preliminary site investigations (PSIs), detailed site investigations (DSIs) and remediation projects in New Zealand, Australia, Asia, the United Kingdom and Ireland. The following provides a summary of Glenn Davis's experience.

Davis Consulting Group (2007 – present): Principal Environmental Scientist – completed multiple preliminary and detailed site investigations in Otago and Southland predominantly for the land development industry. In addition to undertaking investigation and remedial work DCG advises the Southland Regional Council on contaminated land matters including the review of consultant reports and consent applications. Key projects DCG has undertaken include:

- Review of groundwater contamination associated with the former Invercargill gasworks site including the completion of a groundwater investigation and completion of an environmental risk assessment report to support a discharge consent application;
- Completion of site investigations on former landfills in Invercargill to consider the suitability of the sites for commercial/industrial development;
- Management of the removal of an underground fuel tank in Gore and subsequent groundwater investigation; and
- Completion of a number of detailed site investigations in the Te Anau area to consider the suitability of former farm land for residential development.

Arrow Lane, Arrowtown, New Zealand p: 03.409 8664 e: glenn.davis@davisconsultinggroup.co.nz

RPS Australia (2003 – 2006): Supervising Environmental Scientist managing multiple detailed site investigations in the land development industrial and operated as an environmental specialist for Chevron on Barrow Island monitoring and managing a number of large contaminated groundwater plumes.

URS Ireland (2001 – 2003): - Senior Environmental Scientist undertaking multiple PSIs and DSIs on services stations and train station throughout Ireland. Glenn was also involved in the design and operation of a number of large scale remediation projects, predominantly associated with the removal of hydrocarbon contaminated soil and recovery or hydrocarbons impacting groundwater.

ERM Australia (1998 – 2000) – Working as a project level environmental scientist Glenn completed in excess of 30 detailed site investigations and remedial projects on service stations, concrete batching plants, and transport depots.

Appendix B

Certificate of Title

COMPUTER FREEHOLD REGISTER
UNDER LAND TRANSFER ACT 1952

Search Copy

R.W. Muir
Registrar-General
of Land

Identifier	**413072**
Land Registration District	**Otago**
Date Issued	05 August 2008

Prior References

OT13A/734	OT15A/1076	OT17B/806
OT18B/1030	OT18B/991	OT18C/442

Estate	Fee Simple
Area	101.5914 hectares more or less
Legal Description	Lot 7 Deposited Plan 392663

Proprietors

Trojan Helmet Limited

Interests

Subject to a right to convey water in gross over part marked g-h DP 392663 to Arrow Irrigation Company Limited created by Transfer 828083 -21.4.1993 at 9.23 am

X14968 Irrigation Agreement (affects part formerly Section 105 Block VII Shotover SD)

Part formerly Section 105 Block VII Shotover Survey District is Subject to Section 8 Mining Act 1971

Part formerly Section 105 Block VII Shotover Survey District is Subject to Section 5 Coal Mines Act 1979

Subject to Part IV A Conservation Act 1987 (affects Part formerly part Section 102 Block VII Shotover Survey District - herein)

Subject to Section 11 Crown Minerals Act 1991 (affects Part formerly part Section 102 Block VII Shotover Survey District - herein)

X14880 Irrigation Agreement (affects part formerly Section 105 Block VII Shotover SD)

Subject to a right of way over part marked AD DP 392663 created by Transfer 746961.17 - 1.2.1990 at 9:51 am

Subject to a right to convey water over part marked aa-ab,ab-ac,ac-ad,ad-ae,ae-au DP 392663 and right to take & convey water over part marked A DP 392663 created by Transfer 749789 - 12.3.1990 at 9:29 am

Subject to a right to convey water over part marked aa-ab,ab-ac,ac-ad,ad-ae,af-ag,ag-ai,aj-i,i-ak,al-am,ae-af DP 392663,right to take & convey water over part marked A DP 392663 and right to store & convey water over part marked B DP 392663 created by Transfer 773822.1 - 27.2.1991 at 9:12 am

Appurtenant to part formerly part lot 1 DP 21438 are rights to convey water created by Transfer 773822.1 - 27.2.1991 at 9:12 am

Subject to a right to convey water over part marked aj-i,i-ak,al-am DP 392663 and right to store & convey water over part marked B DP 392663 created by Transfer 773822.2 - 27.2.1991 at 9:12 am

Subject to a right to convey water in gross over part marked k-l,m-n,v-w DP 392663 to The Arrow Irrigation Company Limited created by Transfer 825040 - 4.3.1993 at 9:30 am

Subject to a right to convey water in gross over part marked h-i,i-j,j-k DP 392663 to The Arrow Irrigation Company Limited created by Transfer 834732 - 23.7.1993 at 9:32 am

Subject to a right to convey water in gross over part marked o-p,q-y DP 392663 to Arrow Irrigation Company Limited created by Transfer 840451 - 13.10.1993 at 9:51 am

Appurtenant to part formerly CT OT17B/806 is a right to pump water,a right to convey electricity and rights to convey water created by Transfer 915672.3 - 6.9.1996 at 2:49 pm

The easements created by Transfer 915672.3 are subject to Section 243 (a) Resource Management Act 1991

Identifier **413072**

Appurtenant to part formerly CT OT17B/806 is a right to take water created by Transfer 953679.6 - 31.8.1998 at 10:56 am

The easements created by Transfer 953679.6 are subject to Section 243 (a) Resource Management Act 1991

Land Covenant in Deed 964442.3 - 23.3.1999 at 12.55 pm (affects part formerly CT OT17B/806)

7898685.3 Surrender of the right of way marked A,B SO 23066 created by Transfer 746961.17 as to land in CTs OT15A/1076,OT15D/881,OT17B/806,OT18B/991,OT18C/442 - 5.8.2008 at 9:00 am

Subject to a right of way over part marked I,L DP 392663,right to convey telecommunications over part marked AB,AD,Q,AN DP 392663,right to convey electricity marked P,Q,R,AN DP 392663 and right to convey water marked AP,AQ,AR,AO,AN DP 392663 created by Easement Instrument 7898685.11 - 5.8.2008 at 9:00 am

The easements created by Easement Instrument 7898685.11 are subject to Section 243 (a) Resource Management Act 1991

8267348.1 Mortgage to Westpac New Zealand Limited - 28.8.2009 at 9:01 am

Subject to a right to convey electricity (in gross) over parts marked R, I, F, D, P, N, J, O & Q on DP 392663 and over parts marked A & B on DP 420440 and a right to transform electricity (in gross) over parts marked D, O & Q on DP 392663 and over part marked B on DP 420440 in favour of Aurora Energy Limited created by Easement Instrument 8735727.6 - 20.4.2011 at 2:52 pm

Subject to a right to convey water over part marked AQ on DP 392663 created by Easement Instrument 9136139.1 - 14.12.2012 at 1:49 pm

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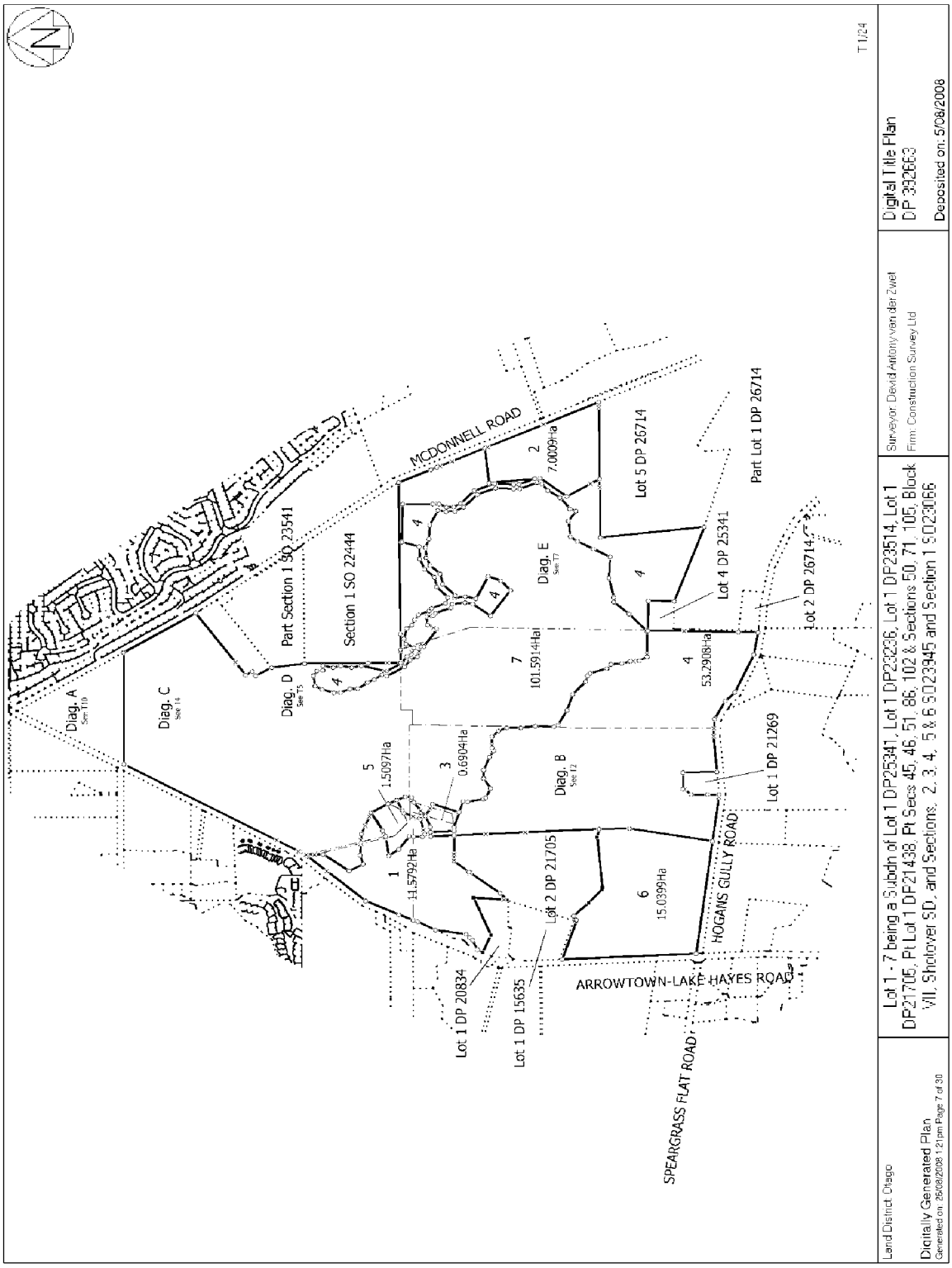

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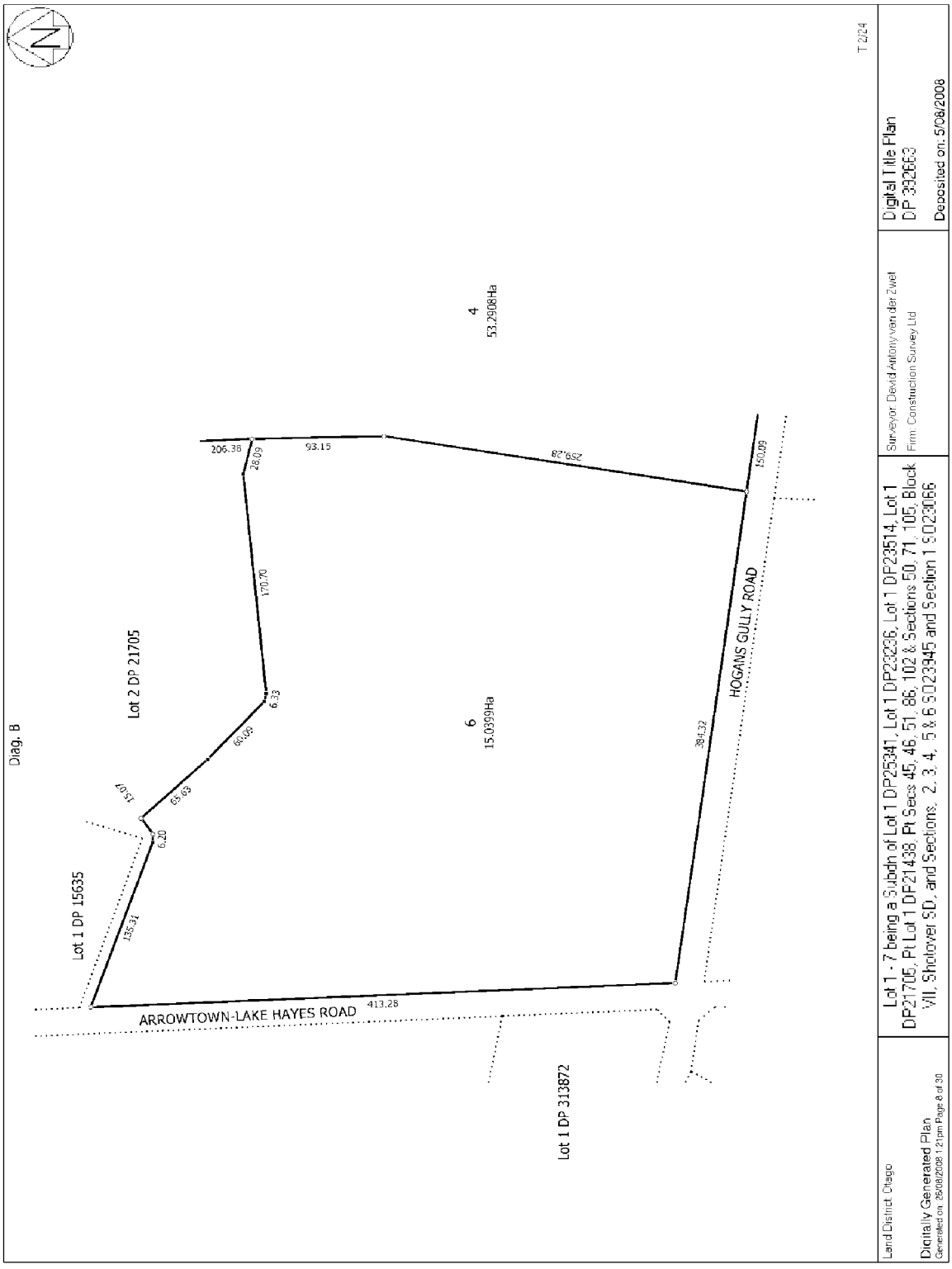

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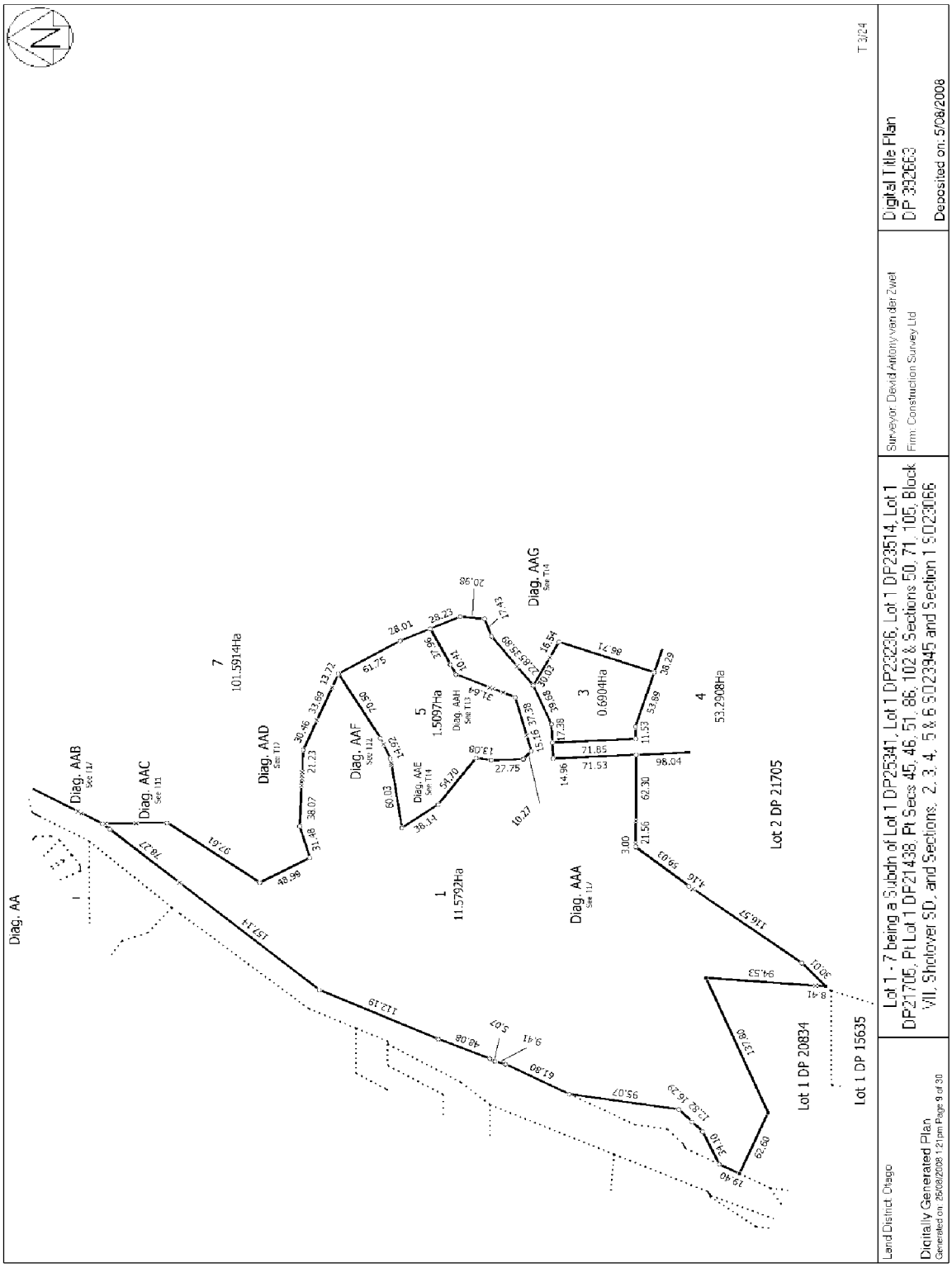

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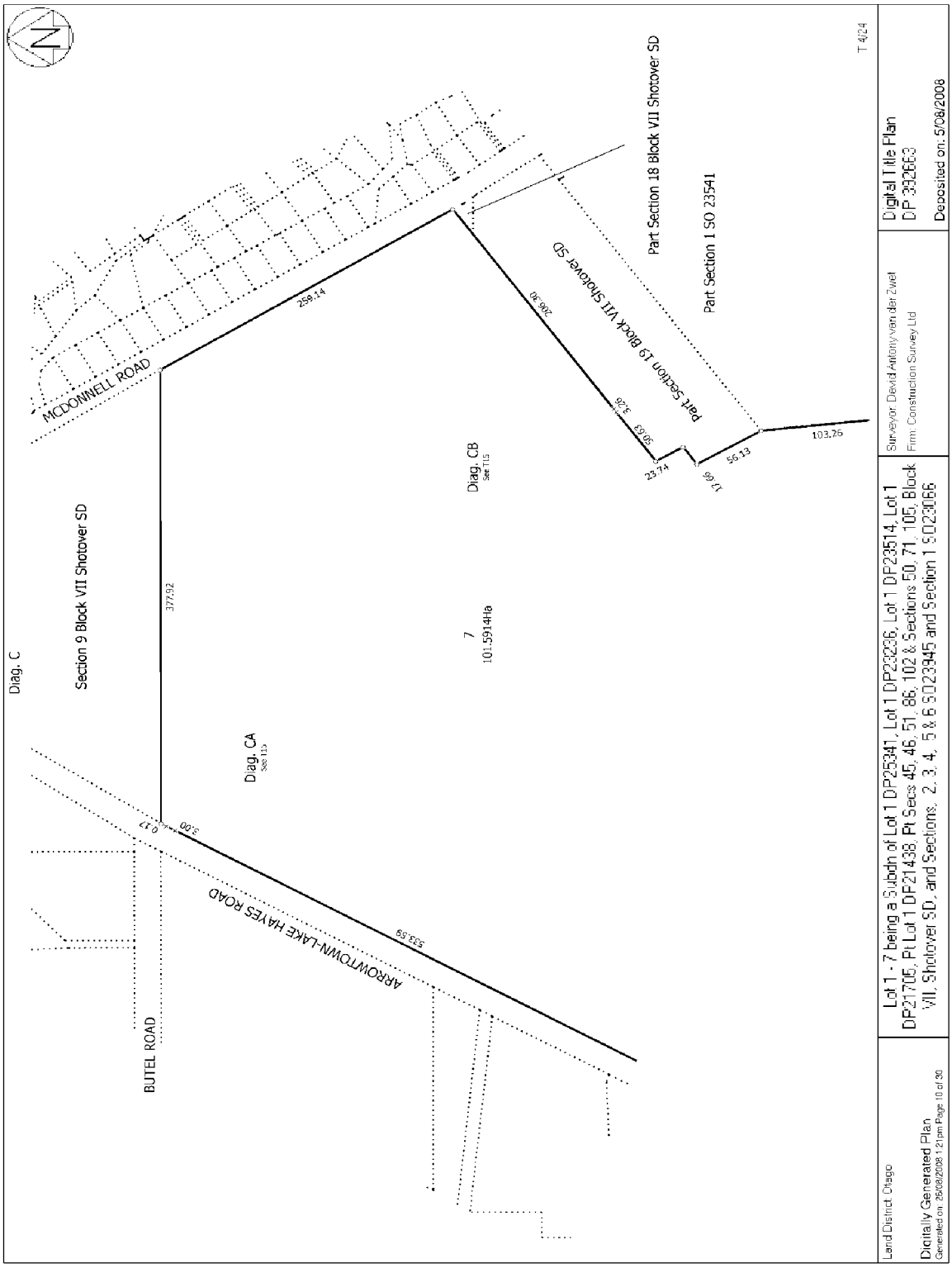

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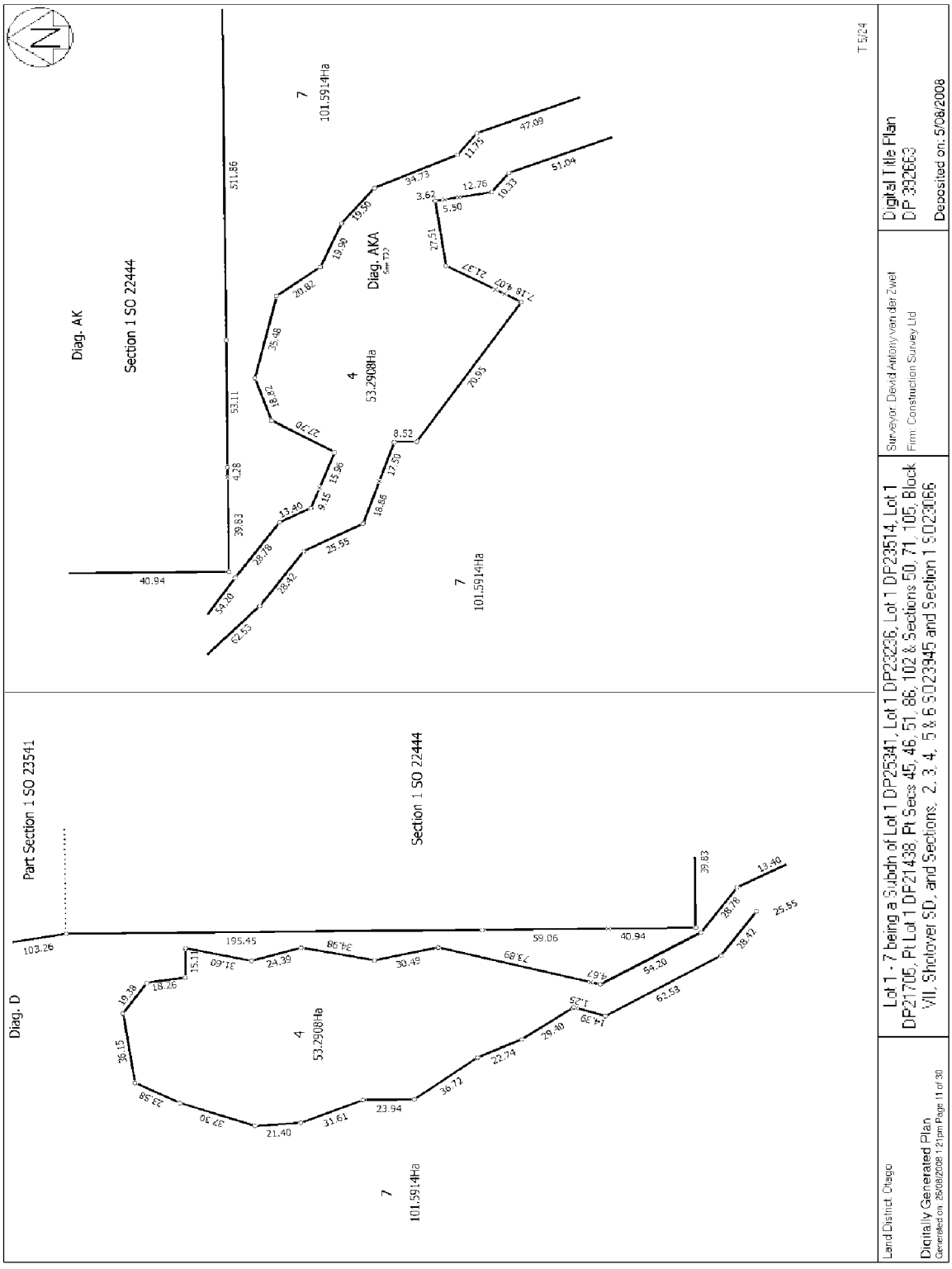

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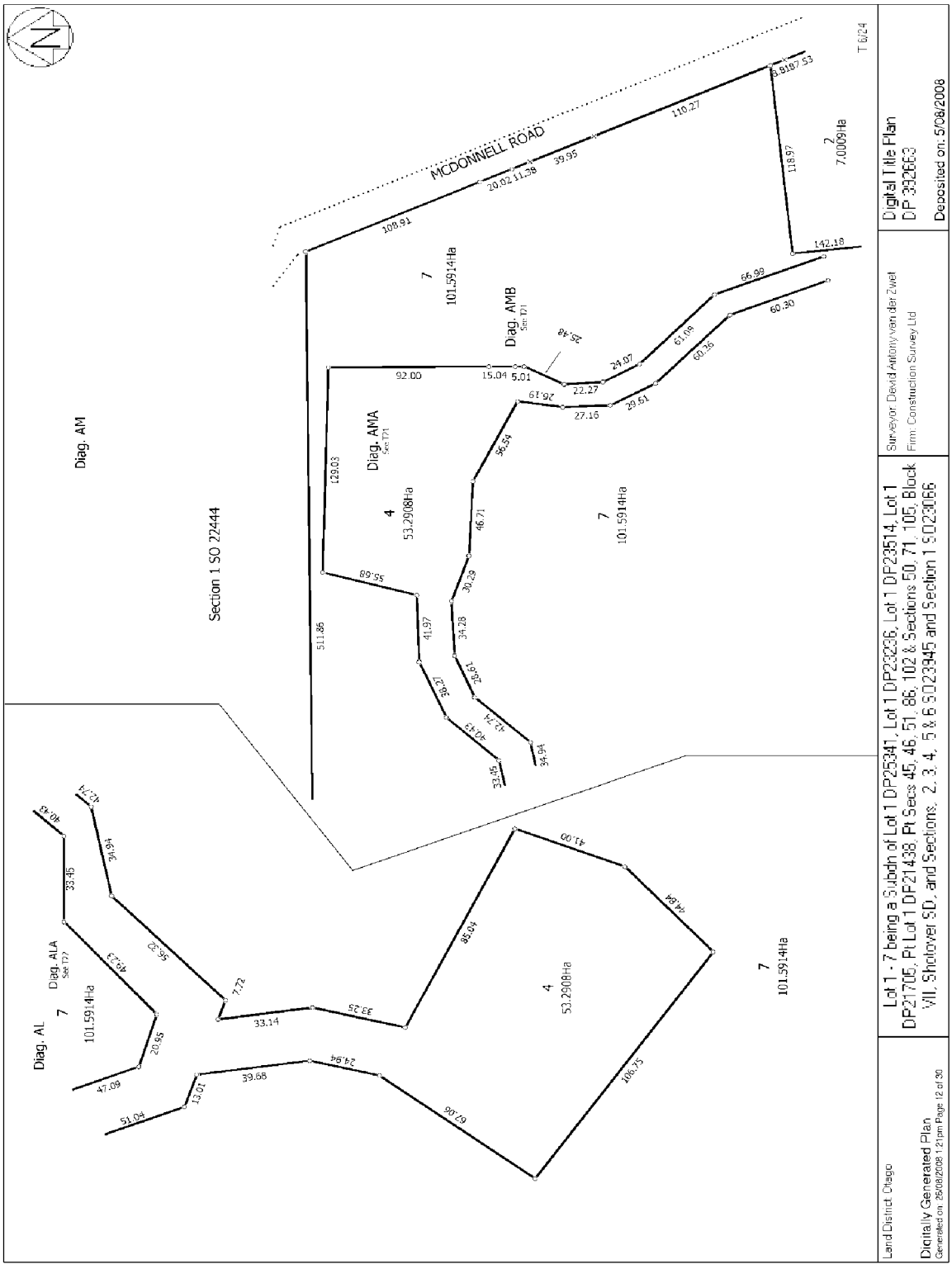

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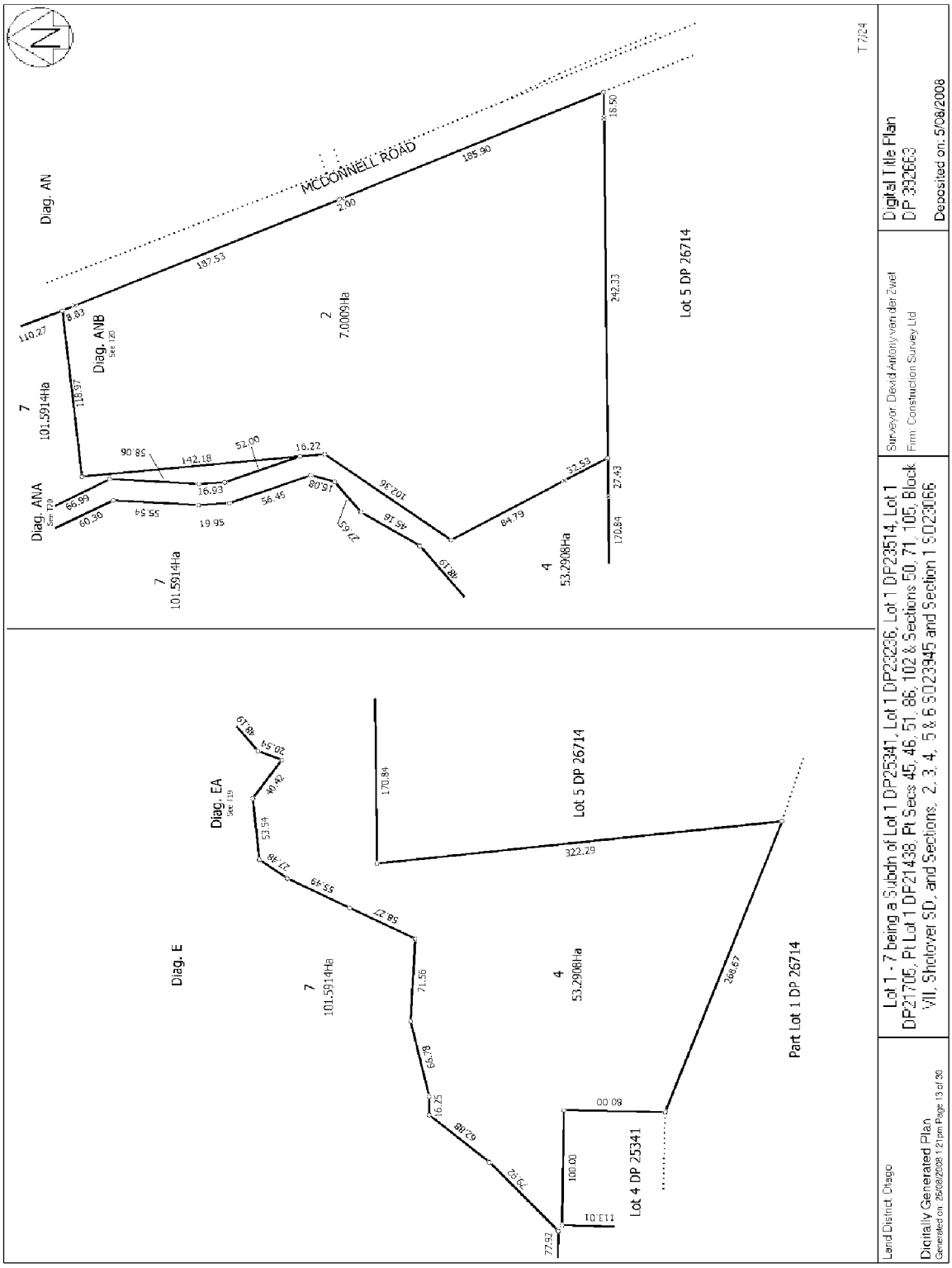

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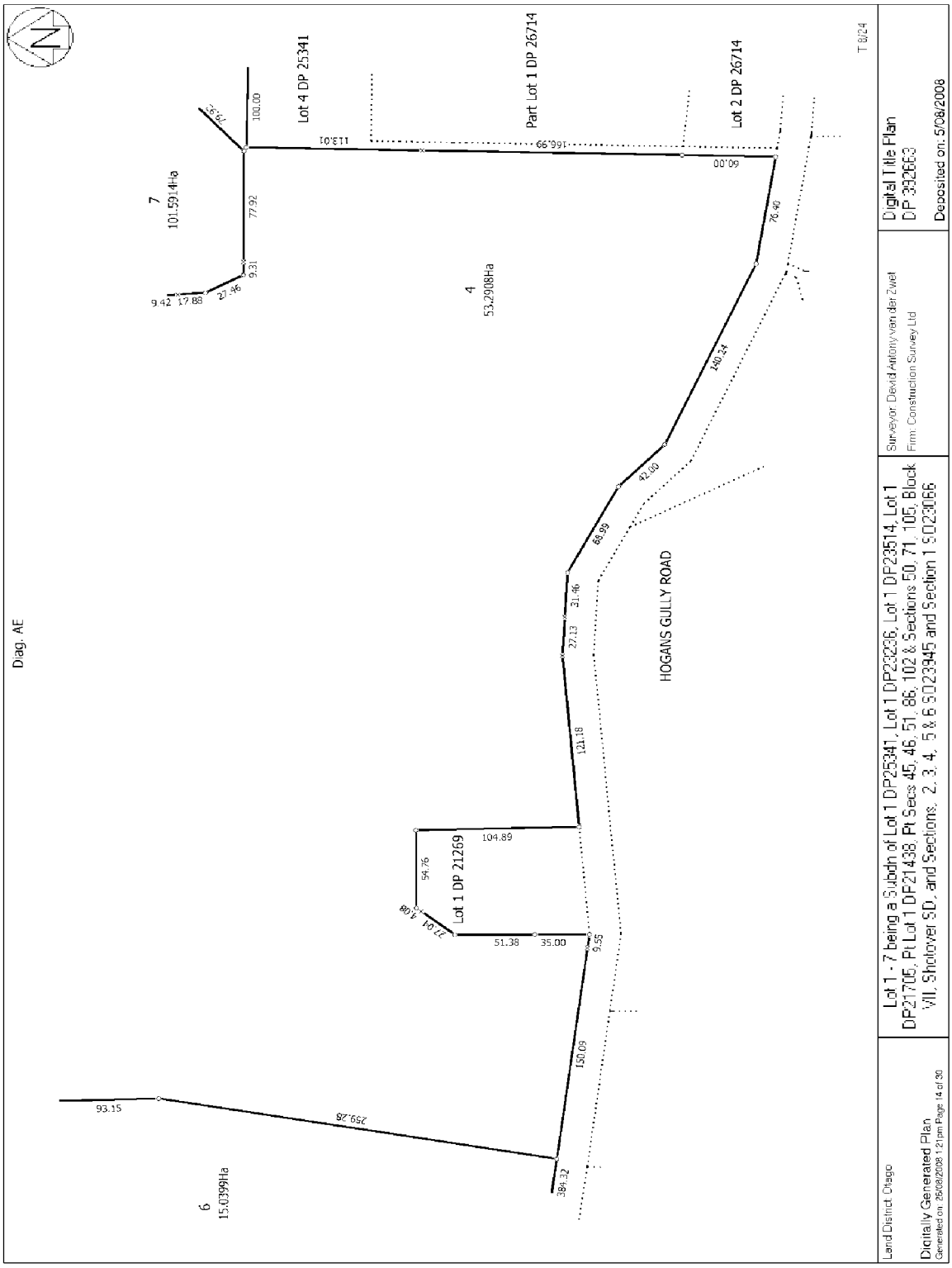

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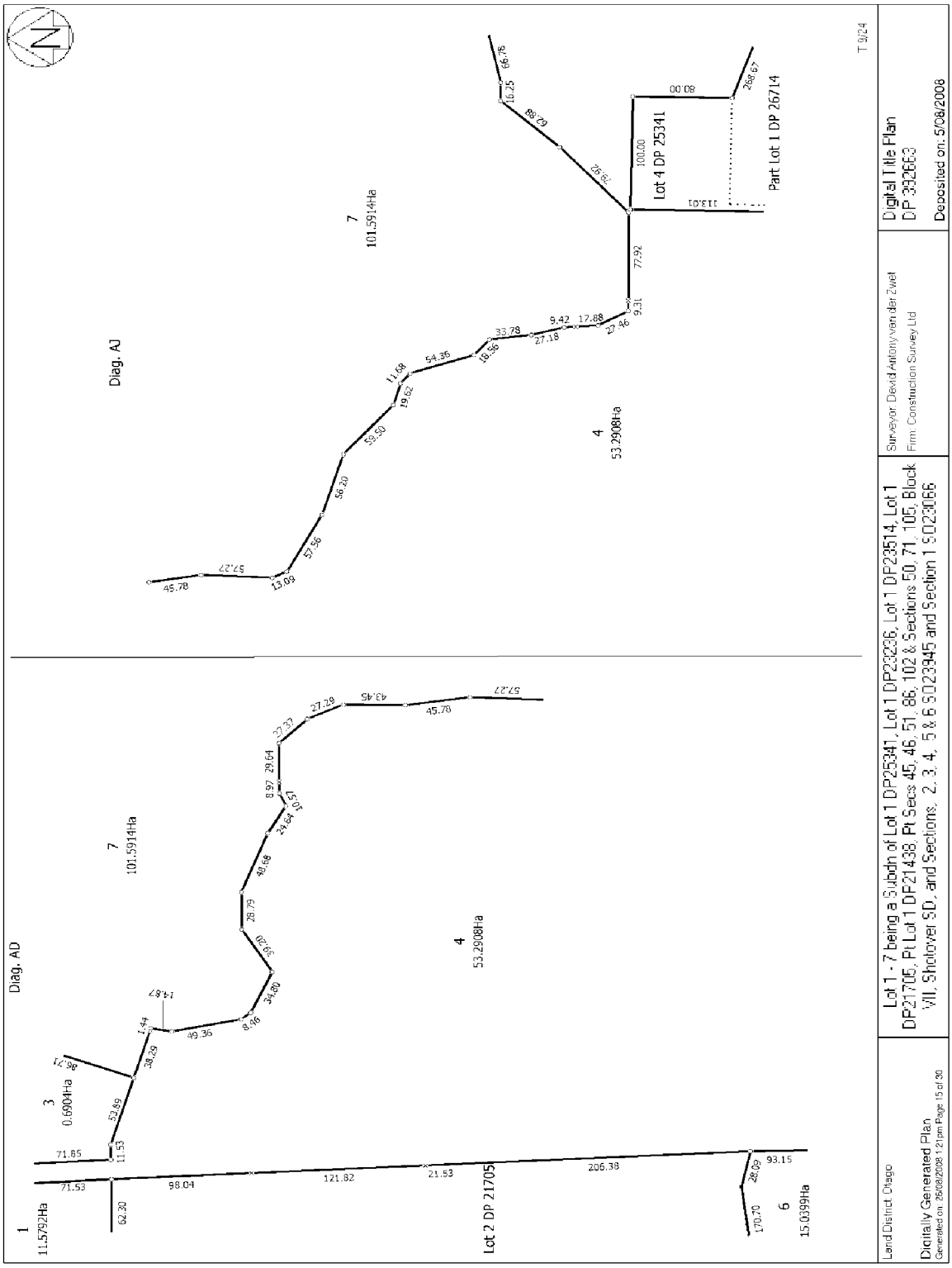

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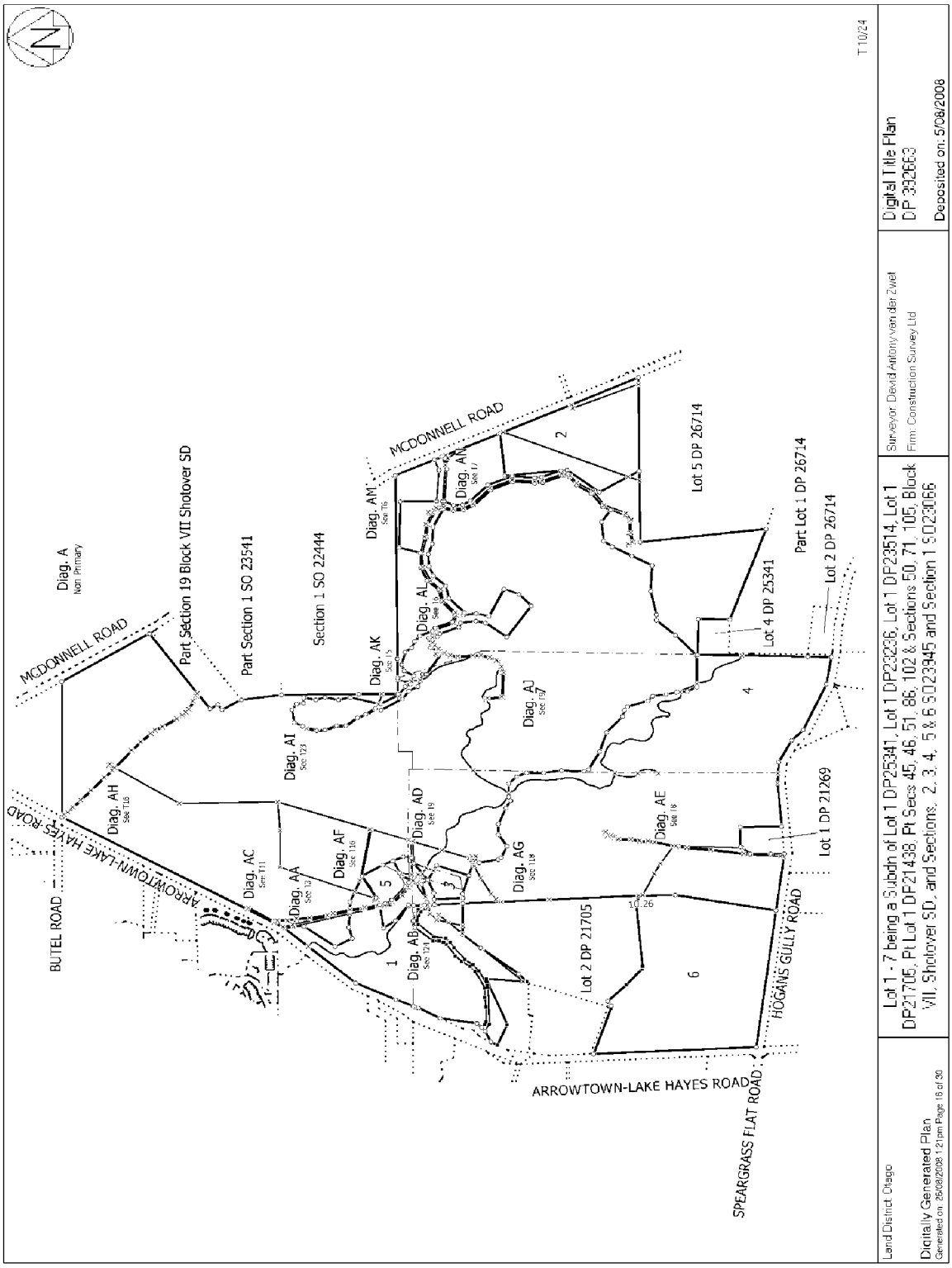

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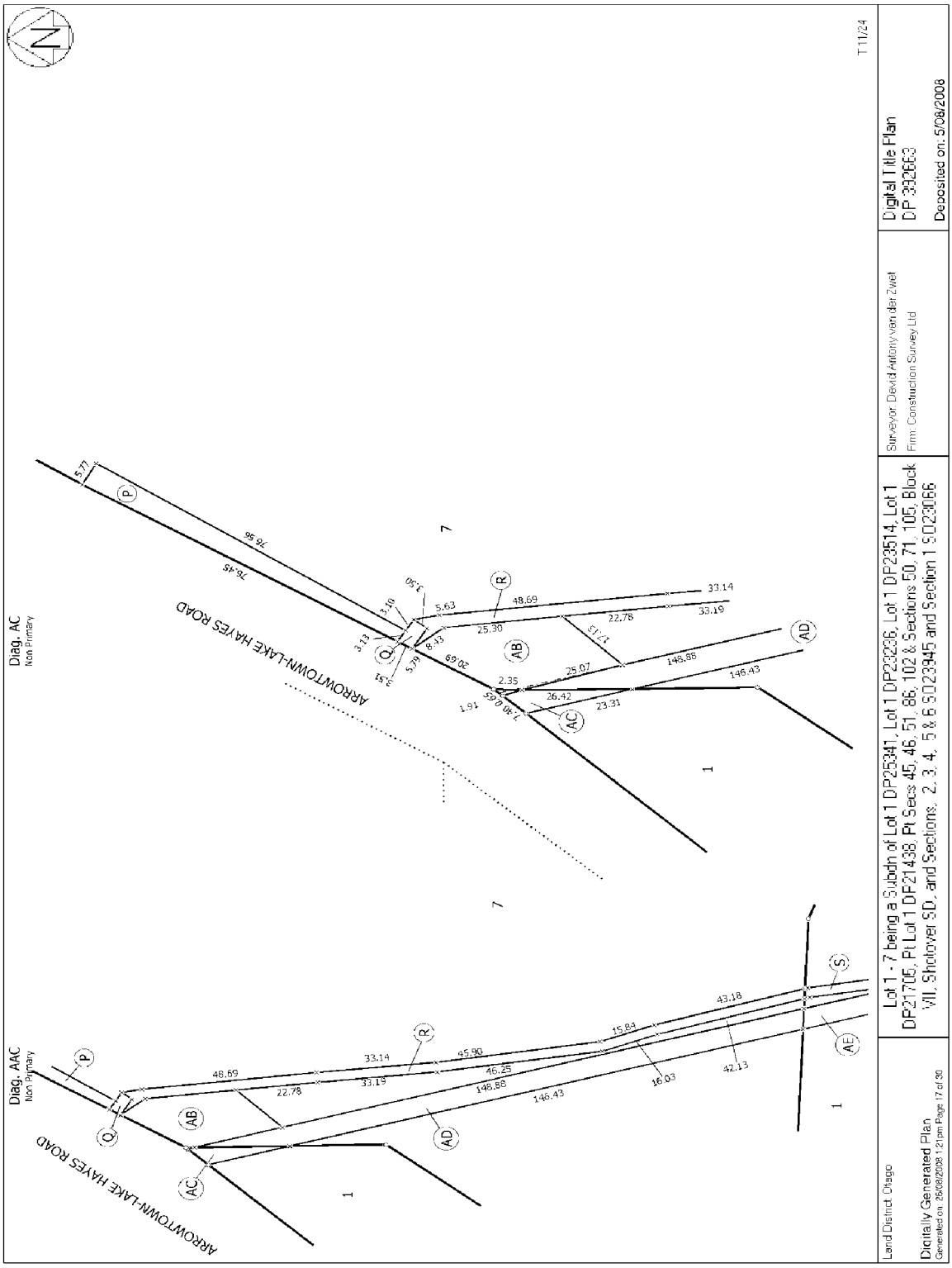

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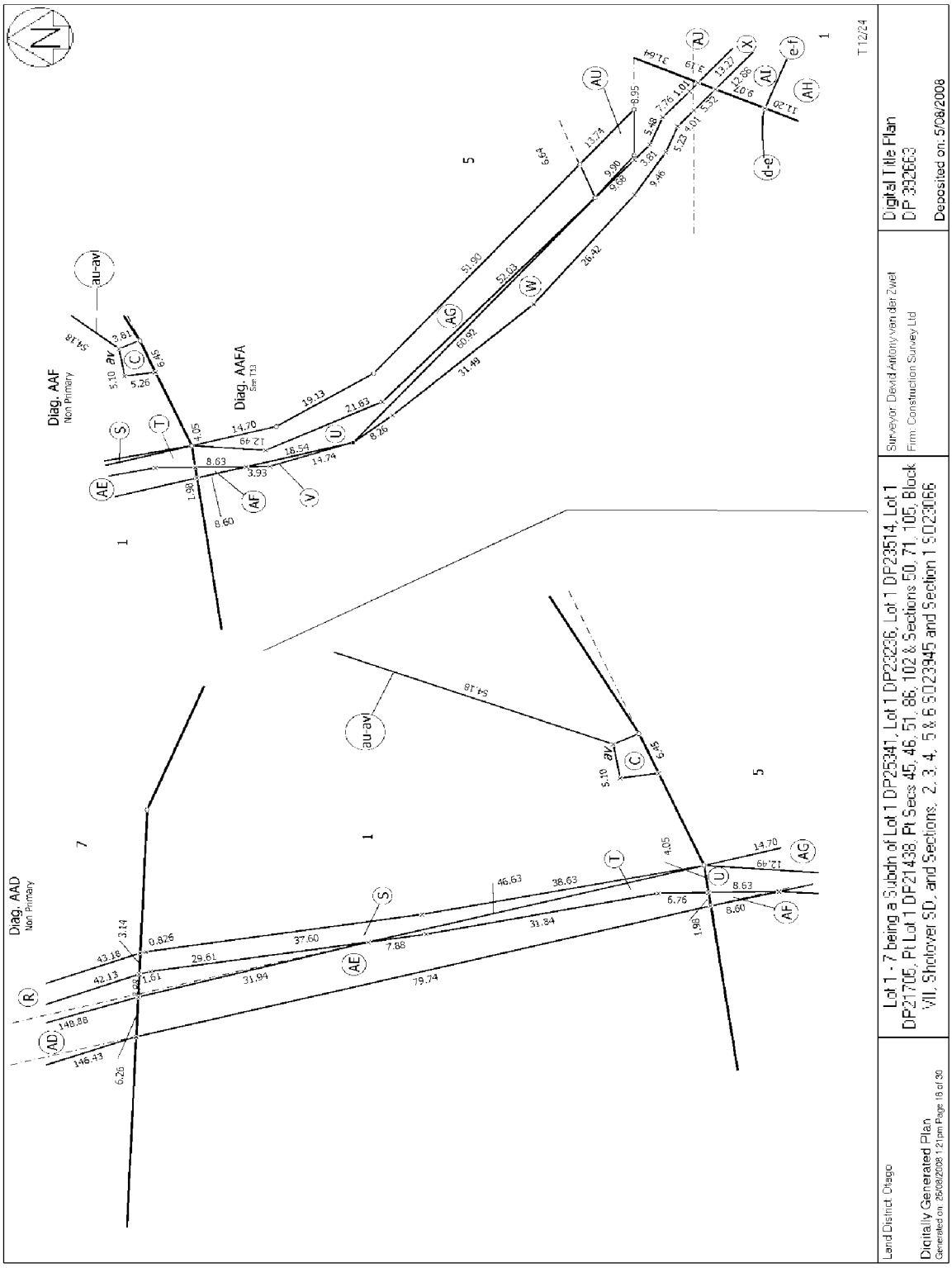

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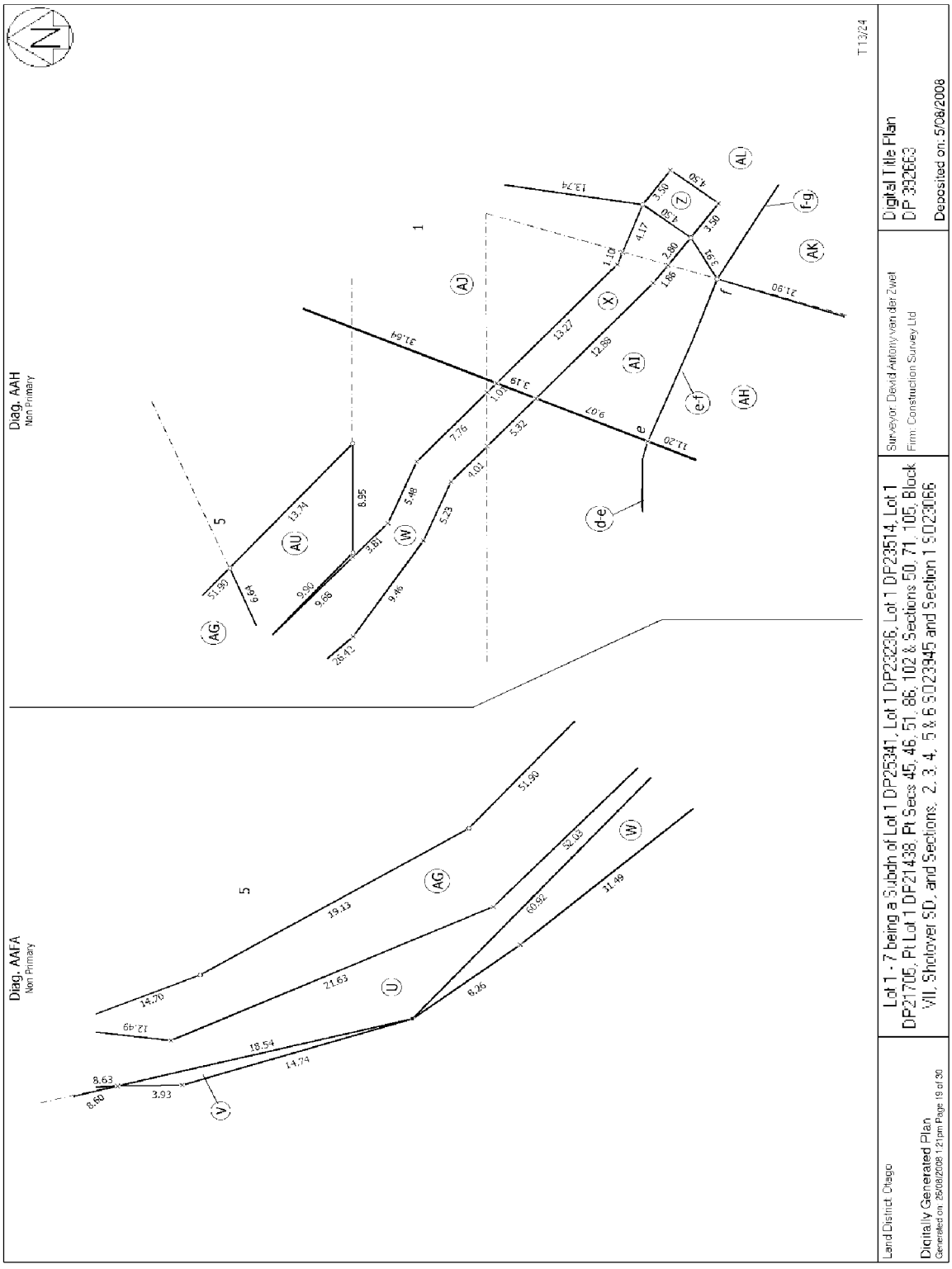

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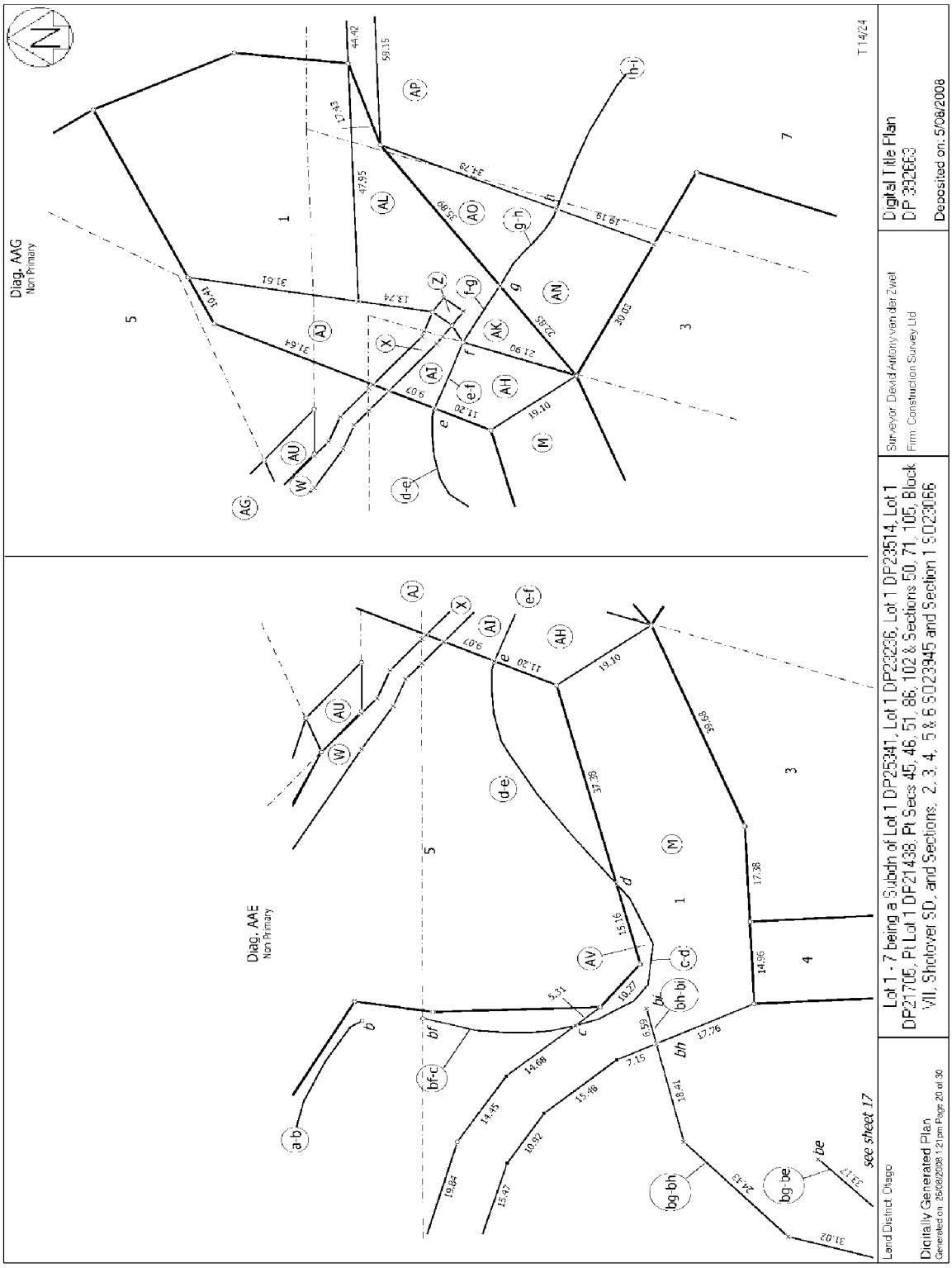

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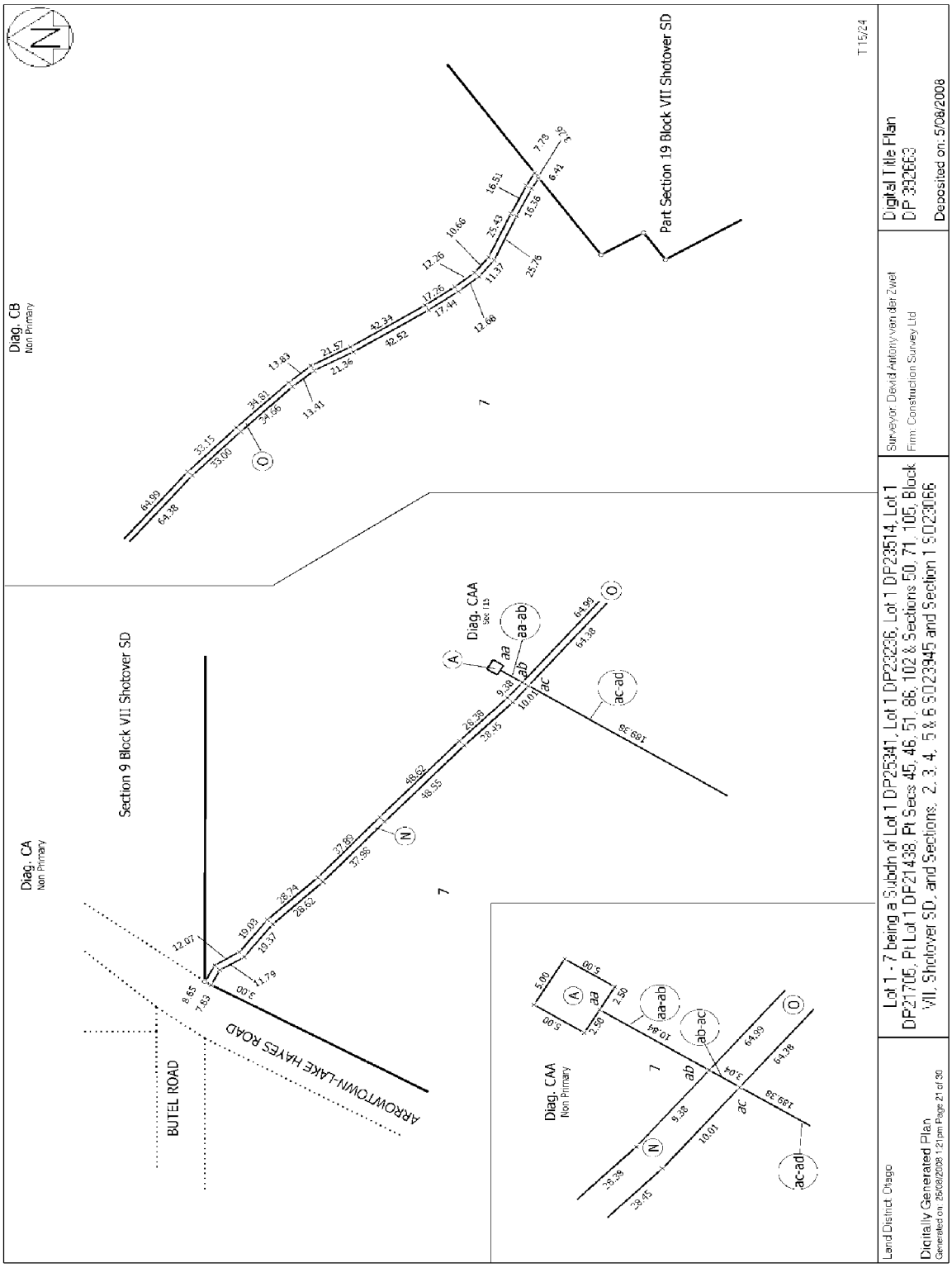

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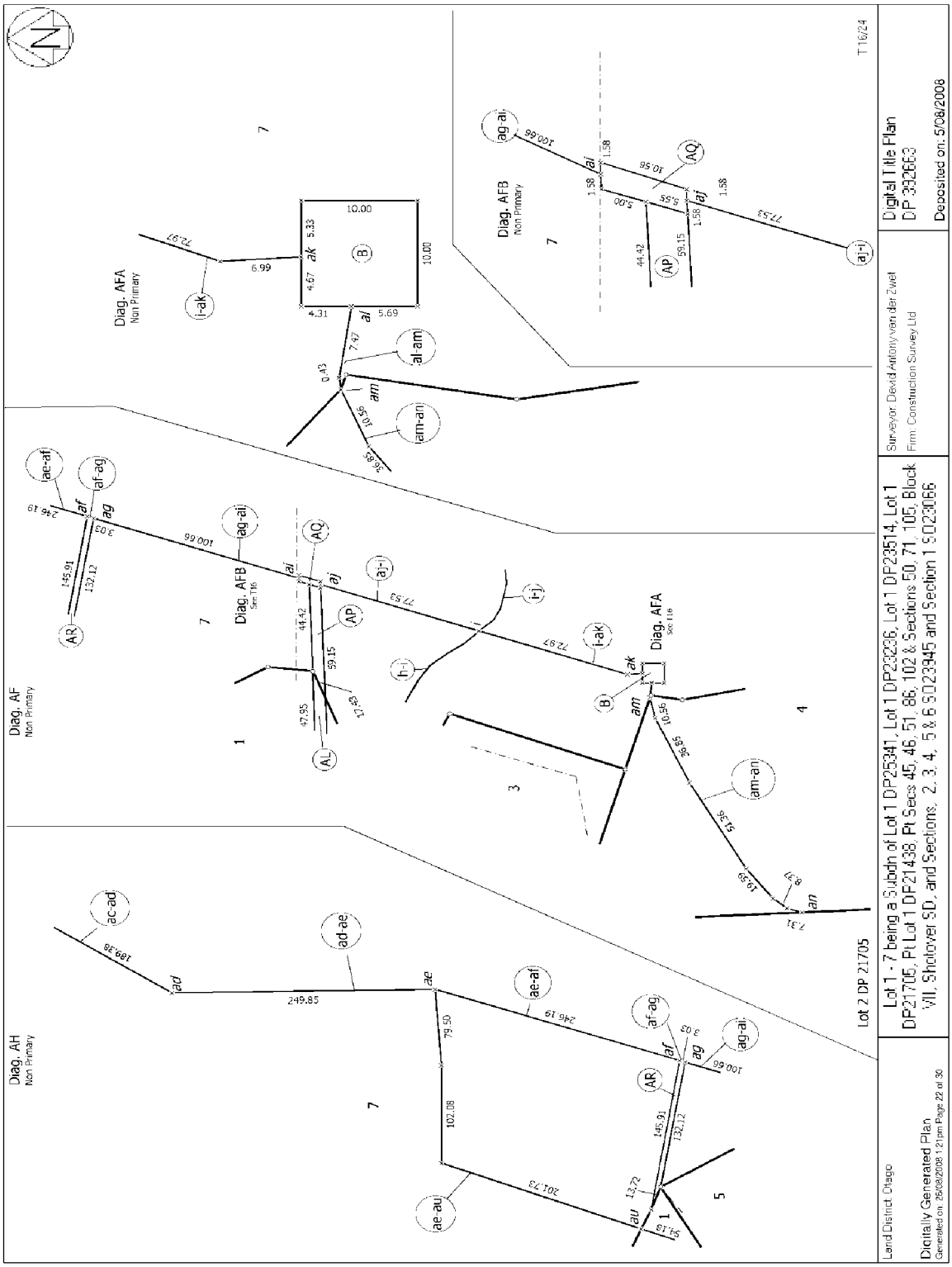

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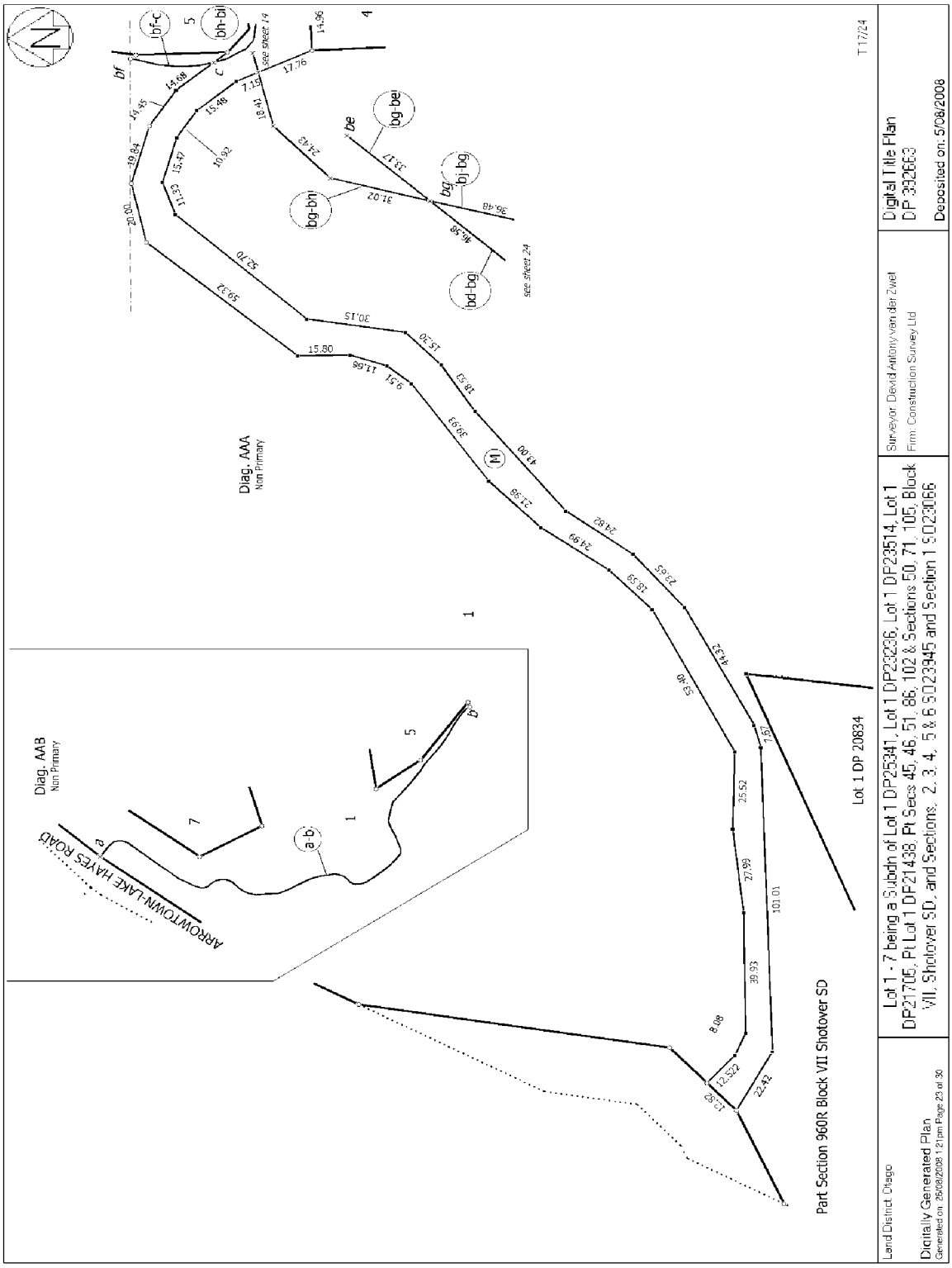

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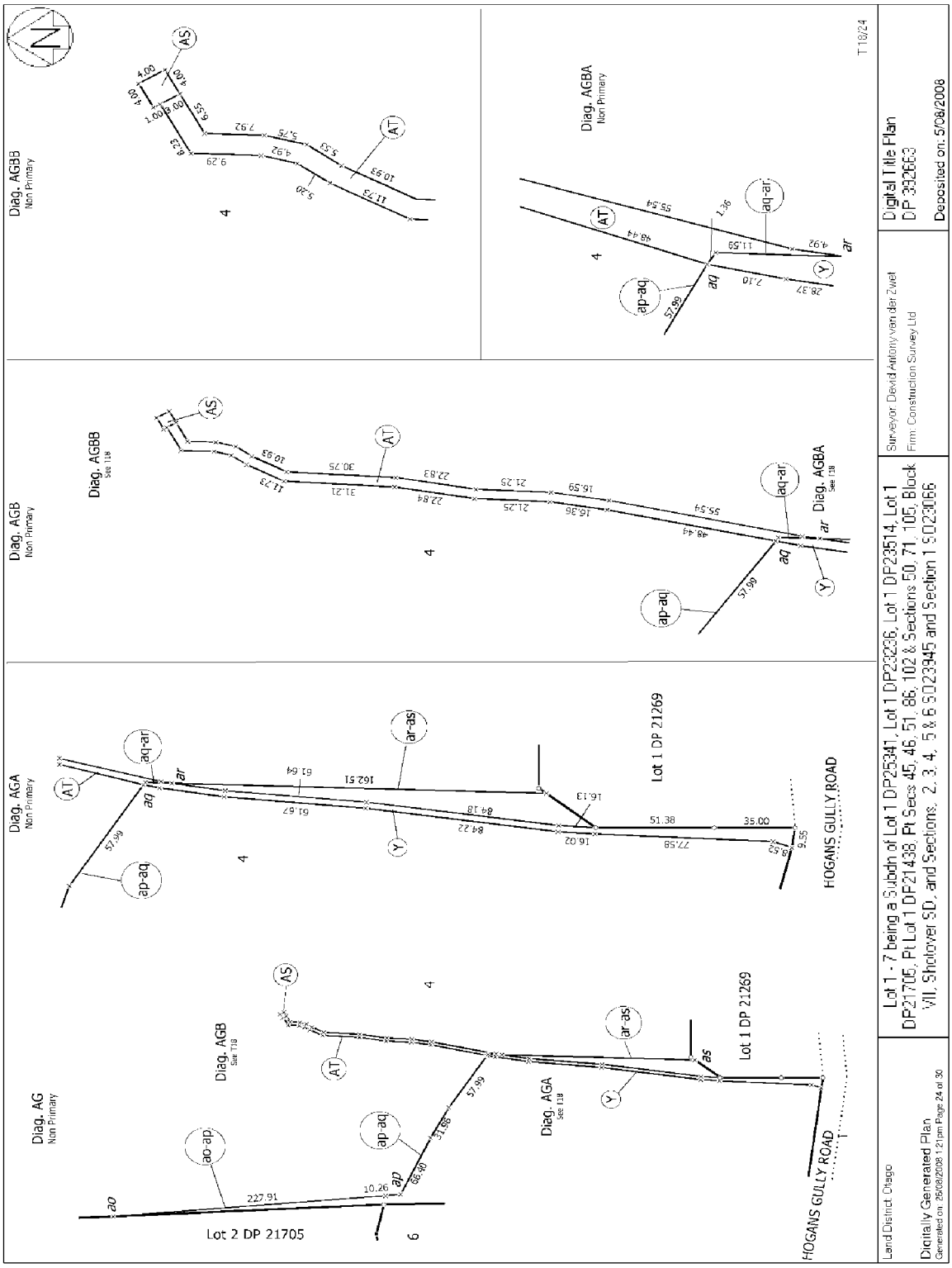

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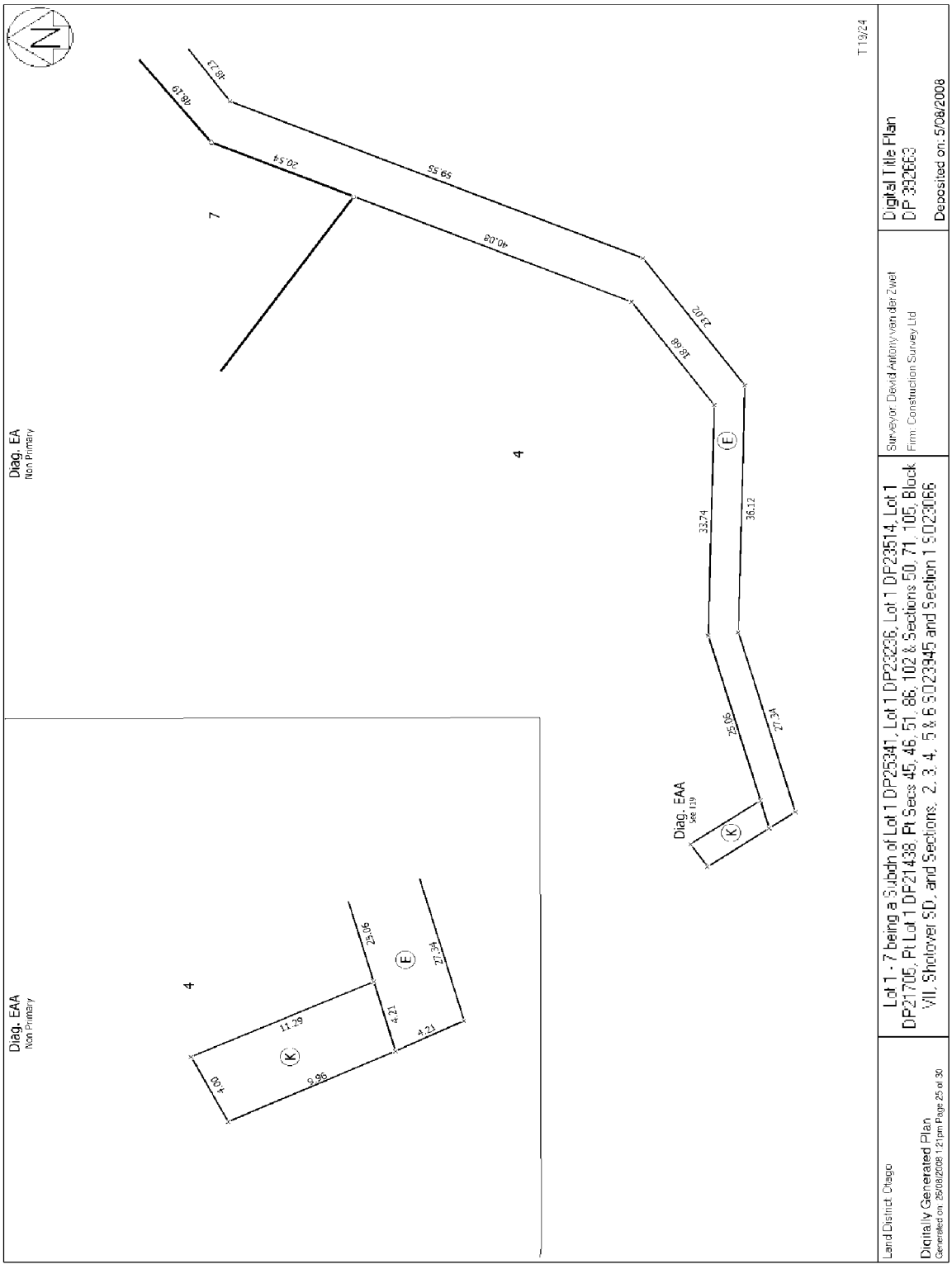

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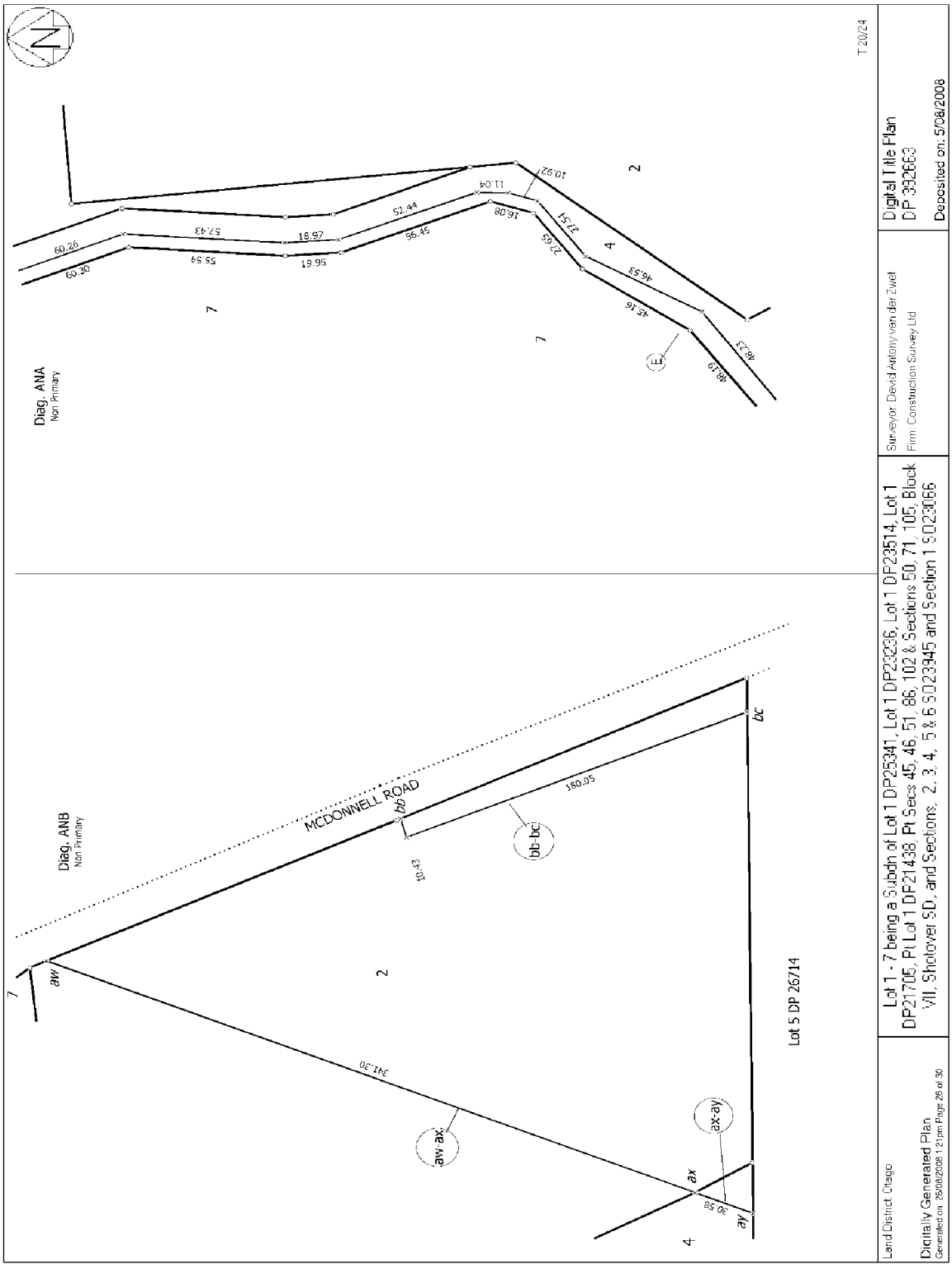

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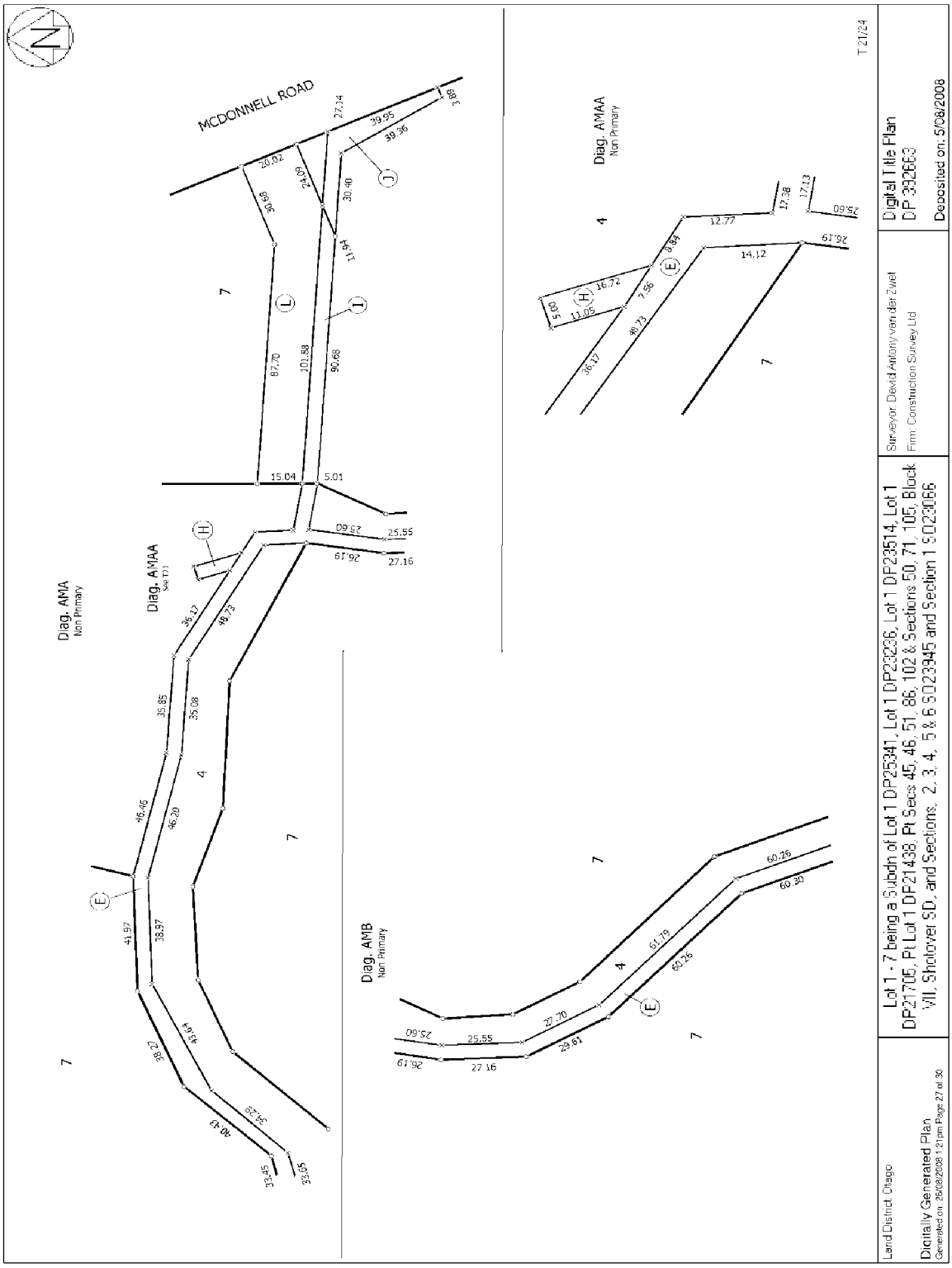

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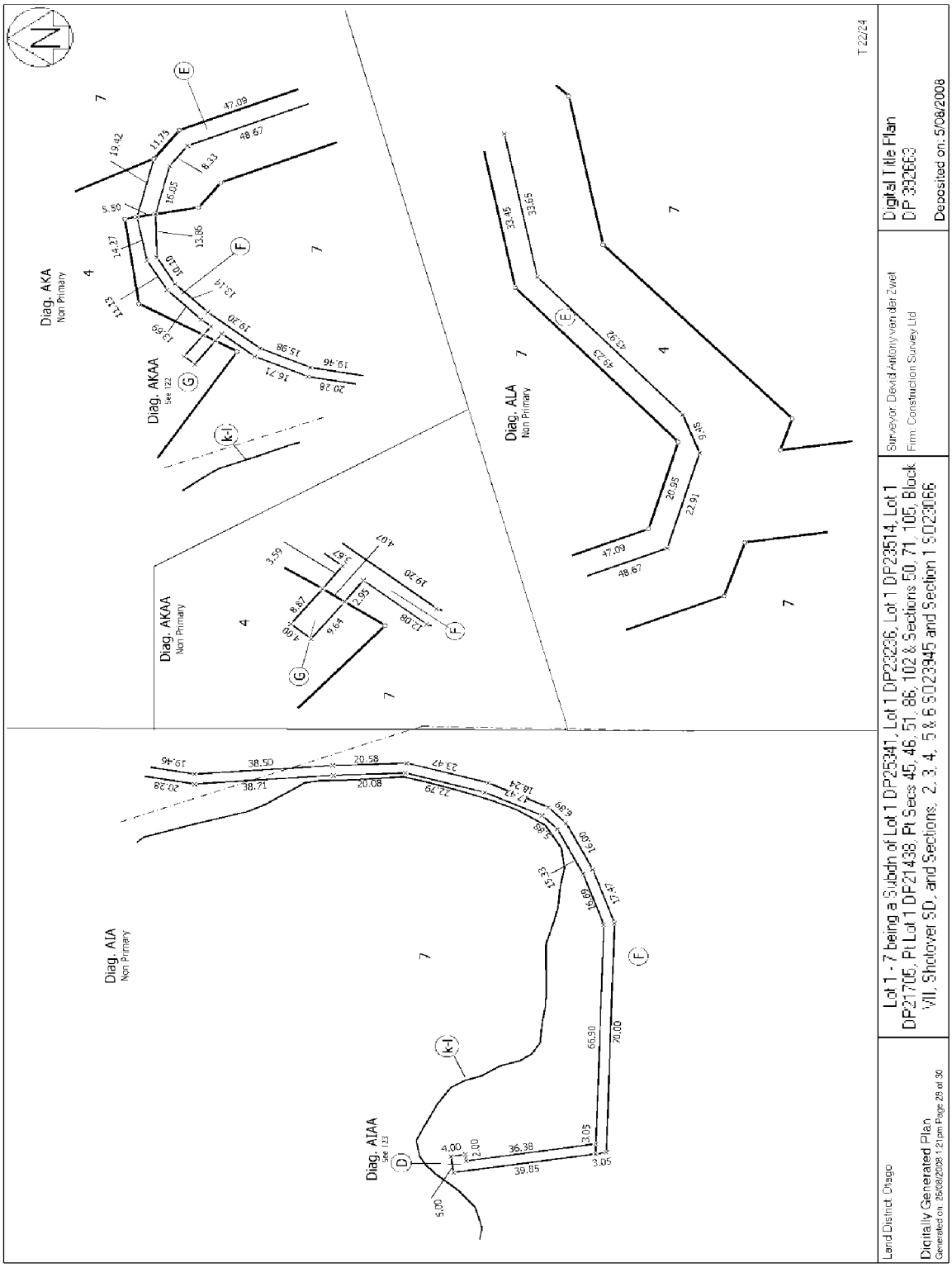

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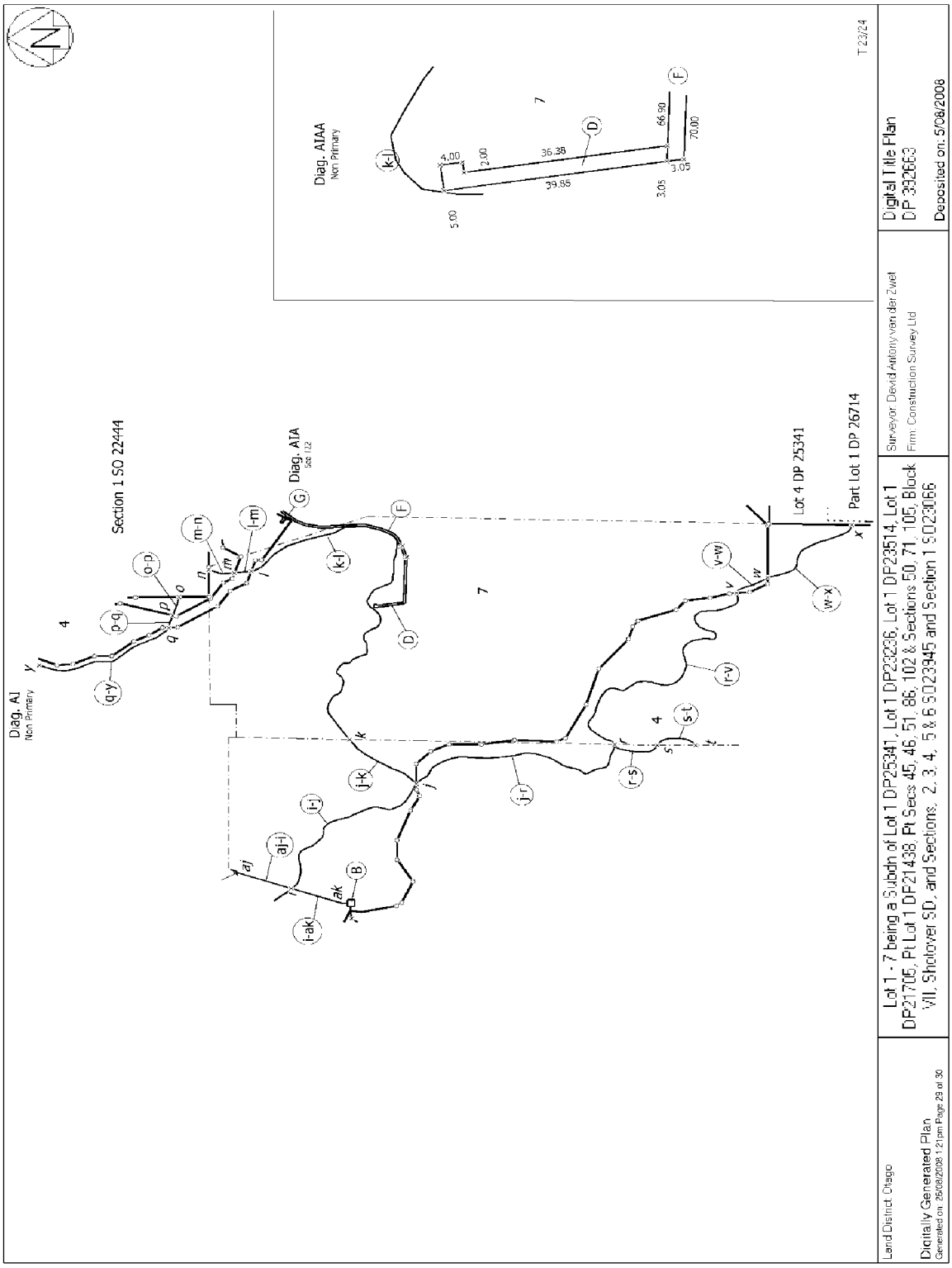

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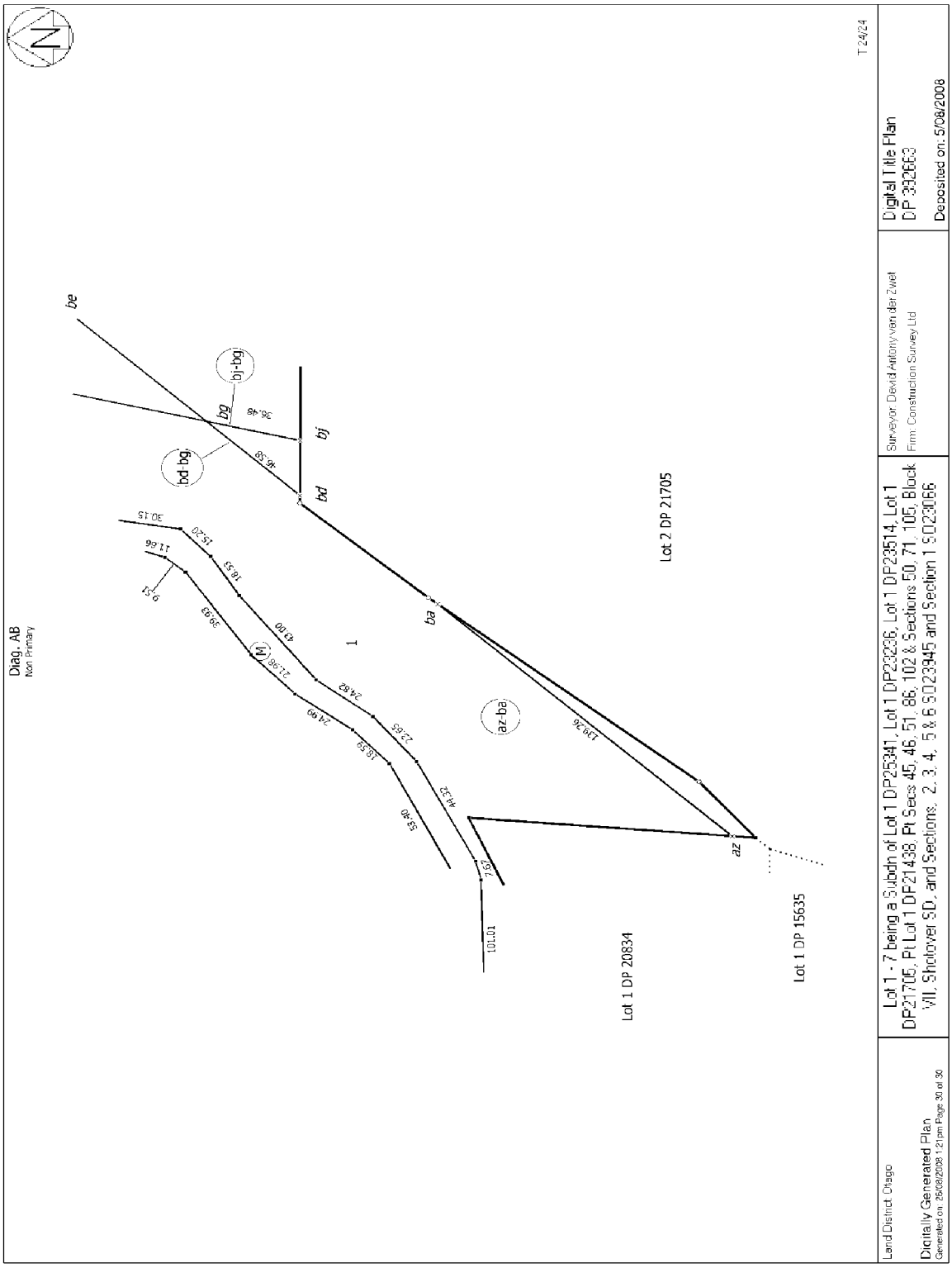

Appendix C

Soil Profile Logs

SOIL PROFILE LOGS

PROJECT NUMBER: 15063 FIELD STAFF: Fiona R DATE: 6/10/2015
SITE NAME: The Hills Area A METHOD: Spade WEATHER: Fine and windy

Sample Location	Coordinates		Sample Depth (m)	Sample ID	Soil Lithology
1	-44.959081	168.819712	0-0.1	AA#1	Greyish brown clayey SILT with organic matter
2	-44.959689	168.819634	0-0.1	AA#2	Greyish brown clayey SILT with organic matter
3	-44.960321	168.819609	0-0.1	AA#3	Greyish brown clayey SILT with organic matter
4	-44.959072	168.820658	0-0.1	AA#4	Greyish brown clayey SILT with organic matter
5	-44.959735	168.820629	0-0.1	AA#5	Greyish brown clayey SILT with organic matter
6	-44.960376	168.820611	0-0.1	AA#6	Greyish brown clayey SILT with organic matter
7	-44.959061	168.821671	0-0.1	AA#7	Greyish brown clayey SILT with organic matter
8	-44.959706	168.821687	0-0.1	AA#8	Greyish brown clayey SILT with organic matter
9	-44.96038	168.821695	0-0.1	AA#9	Yellowish brown clayey SILT with schist gravels
10	-44.960439	168.822622	0-0.1	AA#10	Greyish brown clayey SILT with organic matter
11	-44.959768	168.822719	0-0.1	AA#11	Greyish brown clayey SILT with organic matter
12	-44.959137	168.82282	0-0.1	AA#12	Greyish brown clayey SILT with organic matter
13	-44.959666	168.824346	0-0.1	AA#13	Greyish brown clayey SILT with organic matter
14	-44.960319	168.824145	0-0.1	AA#14	Greyish brown clayey SILT with organic matter
15	-44.960925	168.823987	0-0.1	AA#15	Greyish brown clayey SILT with organic matter

Appendix D

Bore Search Information

Land-use and Site Contamination Request - McDonnell Road / 37 Hogans Gully Road

452

Appendix E

Laboratory Certificates and Chain of Custody

Hill Laboratories
BETTER TESTING BETTER RESULTS

R J Hill Laboratories Limited
1 Clyde Street
Private Bag 3205
Hamilton 3240, New Zealand

Tel +64 7 858 2000
Fax +64 7 858 2001
Email mail@hill-labs.co.nz
Web www.hill-labs.co.nz

ANALYSIS REPORT

Client:	Davis Consulting Group Limited	**Lab No:**	1485293 SPv1
Contact:	Fiona Rowley	**Date Registered:**	07-Oct-2015
	C/- Davis Consulting Group Limited	**Date Reported:**	19-Oct-2015
	PO Box 2450	**Quote No:**	
	Wakatipu	**Order No:**	
	QUEENSTOWN 9349	**Client Reference:**	The Hills Area A+B 15063
		Submitted By:	Fiona Rowley

Sample Type: Soil

Sample Name:		AA#2 (0.1) 06-Oct-2015 10:50 am	AA#4 (0.1) 06-Oct-2015 11:00 am	AA#5 (0.1) 06-Oct-2015 11:05 am	AA#8 (0.1) 06-Oct-2015 11:20 am	AA#11 (0.1) 06-Oct-2015 11:35 am
Lab Number:		1485293.2	1485293.4	1485293.5	1485293.8	1485293.11
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Recoverable Arsenic	mg/kg dry wt	-	9	-	-	-
Total Recoverable Cadmium	mg/kg dry wt	-	0.17	-	-	-
Total Recoverable Chromium	mg/kg dry wt	-	9	-	-	-
Total Recoverable Copper	mg/kg dry wt	-	13	-	-	-
Total Recoverable Lead	mg/kg dry wt	-	16.2	-	-	-
Total Recoverable Nickel	mg/kg dry wt	-	8	-	-	-
Total Recoverable Zinc	mg/kg dry wt	-	53	-	-	-
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
alpha-BHC	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
beta-BHC	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
delta-BHC	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
gamma-BHC (Lindane)	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
cis-Chlordane	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
trans-Chlordane	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.04	-	< 0.04	< 0.04	< 0.04
2,4'-DDD	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
4,4'-DDD	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
2,4'-DDE	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
4,4'-DDE	mg/kg dry wt	0.138	-	0.150	0.073	0.043
2,4'-DDT	mg/kg dry wt	< 0.010	-	0.011	< 0.010	< 0.010
4,4'-DDT	mg/kg dry wt	0.060	-	0.066	0.018	0.013
Dieldrin	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
Endosulfan I	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
Endosulfan II	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
Endosulfan sulphate	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
Endrin	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
Endrin aldehyde	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
Endrin ketone	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
Heptachlor	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
Heptachlor epoxide	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
Hexachlorobenzene	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010
Methoxychlor	mg/kg dry wt	< 0.010	-	< 0.010	< 0.010	< 0.010

Sample Type: Soil						
Sample Name:		AA#14 (0.1) 06-Oct-2015 11:50 am	A Dup #1 06-Oct-2015 11:01 am	A Dup #2 06-Oct-2015 2:06 pm	AB#2 (0.1) 06-Oct-2015 1:45 pm	AB#5 (0.1) 06-Oct-2015 2:00 pm
Lab Number:		1485293.14	1485293.16	1485293.17	1485293.19	1485293.22
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Recoverable Arsenic	mg/kg dry wt	-	10	10	-	-
Total Recoverable Cadmium	mg/kg dry wt	-	0.15	0.15	-	-
Total Recoverable Chromium	mg/kg dry wt	-	9	10	-	-
Total Recoverable Copper	mg/kg dry wt	-	13	9	-	-
Total Recoverable Lead	mg/kg dry wt	-	16.6	18.2	-	-
Total Recoverable Nickel	mg/kg dry wt	-	8	8	-	-
Total Recoverable Zinc	mg/kg dry wt	-	55	45	-	-
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.010	-	-	< 0.010	< 0.010
alpha-BHC	mg/kg dry wt	< 0.010	-	-	< 0.010	< 0.010
beta-BHC	mg/kg dry wt	< 0.010	-	-	< 0.010	< 0.010
delta-BHC	mg/kg dry wt	< 0.010	-	-	< 0.010	< 0.010
gamma-BHC (Lindane)	mg/kg dry wt	< 0.010	-	-	< 0.010	< 0.010
cis-Chlordane	mg/kg dry wt	< 0.010	-	-	< 0.010	< 0.010
trans-Chlordane	mg/kg dry wt	< 0.010	-	-	< 0.010	< 0.010
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.04	-	-	< 0.04	< 0.04
2,4'-DDD	mg/kg dry wt	< 0.010	-	-	< 0.010	< 0.010
4,4'-DDD	mg/kg dry wt	< 0.010	-	-	< 0.010	< 0.010
2,4'-DDE	mg/kg dry wt	< 0.010	-	-	< 0.010	< 0.010
4,4'-DDE	mg/kg dry wt	< 0.010	-	-	< 0.010	< 0.010
2,4'-DDT	mg/kg dry wt	< 0.010	-	-	< 0.010	< 0.010
4,4'-DDT	mg/kg dry wt	< 0.010	-	-	< 0.010	< 0.010
Dieldrin	mg/kg dry wt	< 0.010	-	-	< 0.010	< 0.010
Endosulfan I	mg/kg dry wt	< 0.010	-	-	< 0.010	< 0.010
Endosulfan II	mg/kg dry wt	< 0.010	-	-	< 0.010	< 0.010
Endosulfan sulphate	mg/kg dry wt	< 0.010	-	-	< 0.010	< 0.010
Endrin	mg/kg dry wt	< 0.010	-	-	< 0.010	< 0.010
Endrin aldehyde	mg/kg dry wt	< 0.010	-	-	< 0.010	< 0.010
Endrin ketone	mg/kg dry wt	< 0.010	-	-	< 0.010	< 0.010
Heptachlor	mg/kg dry wt	< 0.010	-	-	< 0.010	< 0.010
Heptachlor epoxide	mg/kg dry wt	< 0.010	-	-	< 0.010	< 0.010
Hexachlorobenzene	mg/kg dry wt	< 0.010	-	-	< 0.010	< 0.010
Methoxychlor	mg/kg dry wt	< 0.010	-	-	< 0.010	< 0.010

Sample Name:		AB#6 (0.1) 06-Oct-2015 2:05 pm	AB#7 (0.1) 06-Oct-2015 2:15 pm	AB#8 (0.1) 06-Oct-2015 2:20 pm	AB#9 (0.1) 06-Oct-2015 2:25 pm	AB-Battery 06-Oct-2015 2:10 pm
Lab Number:		1485293.23	1485293.24	1485293.25	1485293.26	1485293.27
Individual Tests						
Dry Matter	g/100g as rcvd	-	80	77	81	-
pH*	pH Units	-	-	-	-	5.2
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Recoverable Arsenic	mg/kg dry wt	10	-	-	-	12
Total Recoverable Cadmium	mg/kg dry wt	0.14	-	-	-	< 0.10
Total Recoverable Chromium	mg/kg dry wt	11	-	-	-	11
Total Recoverable Copper	mg/kg dry wt	9	-	-	-	10
Total Recoverable Lead	mg/kg dry wt	18.6	-	-	-	22
Total Recoverable Nickel	mg/kg dry wt	9	-	-	-	9
Total Recoverable Zinc	mg/kg dry wt	48	-	-	-	49
Multiresidue Pesticides in Soil samples by GCMS						
Acetochlor	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Alachlor	mg/kg dry wt	-	< 0.006	< 0.006	< 0.006	-
Aldrin	mg/kg dry wt	-	< 0.010	< 0.010	< 0.010	-
Atrazine	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-

Sample Type: Soil						
Sample Name:		AB#6 (0.1) 06-Oct-2015 2:05 pm	AB#7 (0.1) 06-Oct-2015 2:15 pm	AB#8 (0.1) 06-Oct-2015 2:20 pm	AB#9 (0.1) 06-Oct-2015 2:25 pm	AB-Battery 06-Oct-2015 2:10 pm
Lab Number:		1485293.23	1485293.24	1485293.25	1485293.26	1485293.27
Multiresidue Pesticides in Soil samples by GCMS						
Atrazine-desethyl	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Atrazine-desisopropyl	mg/kg dry wt	-	< 0.015	< 0.016	< 0.015	-
Azaconazole	mg/kg dry wt	-	< 0.004	< 0.004	< 0.004	-
Azinphos-methyl	mg/kg dry wt	-	< 0.015	< 0.016	< 0.015	-
Benalaxyl	mg/kg dry wt	-	< 0.004	< 0.004	< 0.004	-
Bendiocarb	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Benodanil	mg/kg dry wt	-	< 0.015	< 0.016	< 0.015	-
alpha-BHC	mg/kg dry wt	-	< 0.010	< 0.010	< 0.010	-
beta-BHC	mg/kg dry wt	-	< 0.010	< 0.010	< 0.010	-
delta-BHC	mg/kg dry wt	-	< 0.010	< 0.010	< 0.010	-
gamma-BHC (Lindane)	mg/kg dry wt	-	< 0.010	< 0.010	< 0.010	-
Bifenthrin	mg/kg dry wt	-	< 0.004	< 0.004	< 0.004	-
Bitertanol	mg/kg dry wt	-	< 0.015	< 0.016	< 0.015	-
Bromacil	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Bromophos-ethyl	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Bromopropylate	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Bupirimate	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Buprofezin	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Butachlor	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Captafol	mg/kg dry wt	-	< 0.04	< 0.04	< 0.04	-
Captan	mg/kg dry wt	-	< 0.015	< 0.016	< 0.015	-
Carbaryl	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Carbofenothion	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Carbofuran	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Carboxin	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
cis-Chlordane	mg/kg dry wt	-	< 0.010	< 0.010	< 0.010	-
trans-Chlordane	mg/kg dry wt	-	< 0.010	< 0.010	< 0.010	-
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	-	< 0.04	< 0.04	< 0.04	-
Chlorfenvinphos	mg/kg dry wt	-	< 0.011	< 0.011	< 0.011	-
Chlorfluazuron	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Chlorothalonil	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Chlorpropham	mg/kg dry wt	-	< 0.015	< 0.016	< 0.015	-
Chlorpyrifos	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Chlorpyrifos-methyl	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Chlortoluron	mg/kg dry wt	-	< 0.015	< 0.016	< 0.015	-
Chlozolinate	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Coumaphos	mg/kg dry wt	-	< 0.015	< 0.016	< 0.015	-
Cyanazine	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Cyfluthrin	mg/kg dry wt	-	< 0.009	< 0.010	< 0.009	-
Cyhalothrin	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Cypermethrin	mg/kg dry wt	-	< 0.018	< 0.019	< 0.018	-
Cyproconazole	mg/kg dry wt	-	< 0.015	< 0.016	< 0.015	-
Cyprodinil	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
2,4'-DDD	mg/kg dry wt	-	< 0.010	< 0.010	< 0.010	-
4,4'-DDD	mg/kg dry wt	-	< 0.010	< 0.010	< 0.010	-
2,4'-DDE	mg/kg dry wt	-	< 0.010	< 0.010	< 0.010	-
4,4'-DDE	mg/kg dry wt	-	< 0.010	< 0.010	0.012	-
2,4'-DDT	mg/kg dry wt	-	< 0.010	< 0.010	< 0.010	-
4,4'-DDT	mg/kg dry wt	-	< 0.010	< 0.010	< 0.010	-
Total DDT Isomers	mg/kg dry wt	-	< 0.06	< 0.06	< 0.06	-
Deltamethrin (including Tralomethrin)	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Demeton-S-methyl	mg/kg dry wt	-	< 0.015	< 0.016	< 0.015	-
Diazinon	mg/kg dry wt	-	< 0.004	< 0.004	< 0.004	-

Sample Type: Soil						
Sample Name:		AB#6 (0.1) 06-Oct-2015 2:05 pm	AB#7 (0.1) 06-Oct-2015 2:15 pm	AB#8 (0.1) 06-Oct-2015 2:20 pm	AB#9 (0.1) 06-Oct-2015 2:25 pm	AB-Battery 06-Oct-2015 2:10 pm
Lab Number:		1485293.23	1485293.24	1485293.25	1485293.26	1485293.27
Multiresidue Pesticides in Soil samples by GCMS						
Dichlobenil	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Dichlofenthion	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Dichlofluanid	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Dichloran	mg/kg dry wt	-	< 0.03	< 0.03	< 0.03	-
Dichlorvos	mg/kg dry wt	-	< 0.010	< 0.010	< 0.010	-
Dicofol	mg/kg dry wt	-	< 0.04	< 0.04	< 0.04	-
Dicrotophos	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Dieldrin	mg/kg dry wt	-	< 0.010	< 0.010	< 0.010	-
Difenoconazole	mg/kg dry wt	-	< 0.011	< 0.011	< 0.011	-
Dimethoate	mg/kg dry wt	-	< 0.015	< 0.016	< 0.015	-
Dinocap	mg/kg dry wt	-	< 0.09	< 0.09	< 0.09	-
Diphenylamine	mg/kg dry wt	-	< 0.015	< 0.016	< 0.015	-
Disulfoton	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Diuron	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Endosulfan I	mg/kg dry wt	-	< 0.010	< 0.010	< 0.010	-
Endosulfan II	mg/kg dry wt	-	< 0.010	< 0.010	< 0.010	-
Endosulfan sulphate	mg/kg dry wt	-	< 0.010	< 0.010	< 0.010	-
Endrin	mg/kg dry wt	-	< 0.010	< 0.010	< 0.010	-
Endrin aldehyde	mg/kg dry wt	-	< 0.010	< 0.010	< 0.010	-
Endrin ketone	mg/kg dry wt	-	< 0.010	< 0.010	< 0.010	-
EPN	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Esfenvalerate	mg/kg dry wt	-	< 0.011	< 0.011	< 0.011	-
Ethion	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Etrimfos	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Famphur	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Fenamiphos	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Fenarimol	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Fenitrothion	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Fenpropathrin	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Fenpropimorph	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Fensulfothion	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Fenthion	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Fenvalerate	mg/kg dry wt	-	< 0.011	< 0.011	< 0.011	-
Fluazifop-butyl	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Fluometuron	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Flusilazole	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Fluvalinate	mg/kg dry wt	-	< 0.006	< 0.006	< 0.006	-
Folpet	mg/kg dry wt	-	< 0.015	< 0.016	< 0.015	-
Furalaxyl	mg/kg dry wt	-	< 0.004	< 0.004	< 0.004	-
Haloxyfop-methyl	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Heptachlor	mg/kg dry wt	-	< 0.010	< 0.010	< 0.010	-
Heptachlor epoxide	mg/kg dry wt	-	< 0.010	< 0.010	< 0.010	-
Hexachlorobenzene	mg/kg dry wt	-	< 0.010	< 0.010	< 0.010	-
Hexaconazole	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Hexazinone	mg/kg dry wt	-	< 0.004	< 0.004	< 0.004	-
Hexythiazox	mg/kg dry wt	-	< 0.04	< 0.04	< 0.04	-
Imazalil	mg/kg dry wt	-	< 0.04	< 0.04	< 0.04	-
Indoxacarb	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Iodofenphos	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
IPBC (3-Iodo-2-propynyl-n-butylcarbamate)	mg/kg dry wt	-	< 0.04	< 0.04	< 0.04	-
Isazophos	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Isofenphos	mg/kg dry wt	-	< 0.004	< 0.004	< 0.004	-
Kresoxim-methyl	mg/kg dry wt	-	< 0.004	< 0.004	< 0.004	-
Leptophos	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-

Sample Type: Soil						
Sample Name:		AB#6 (0.1) 06-Oct-2015 2:05 pm	AB#7 (0.1) 06-Oct-2015 2:15 pm	AB#8 (0.1) 06-Oct-2015 2:20 pm	AB#9 (0.1) 06-Oct-2015 2:25 pm	AB-Battery 06-Oct-2015 2:10 pm
Lab Number:		1485293.23	1485293.24	1485293.25	1485293.26	1485293.27
Multiresidue Pesticides in Soil samples by GCMS						
Linuron	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Malathion	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Metalaxyl	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Methacrifos	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Methamidophos	mg/kg dry wt	-	< 0.04	< 0.04	< 0.04	-
Methidathion	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Methiocarb	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Methoxychlor	mg/kg dry wt	-	< 0.010	< 0.010	< 0.010	-
Metolachlor	mg/kg dry wt	-	< 0.006	< 0.006	< 0.006	-
Metribuzin	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Mevinphos	mg/kg dry wt	-	< 0.015	< 0.016	< 0.015	-
Molinate	mg/kg dry wt	-	< 0.015	< 0.016	< 0.015	-
Myclobutanil	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Naled	mg/kg dry wt	-	< 0.04	< 0.04	< 0.04	-
Nitrofen	mg/kg dry wt	-	< 0.015	< 0.016	< 0.015	-
Nitrothal-isopropyl	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Norflurazon	mg/kg dry wt	-	< 0.015	< 0.016	< 0.015	-
Omethoate	mg/kg dry wt	-	< 0.04	< 0.04	< 0.04	-
Oxadiazon	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Oxychlordane	mg/kg dry wt	-	< 0.004	< 0.004	< 0.004	-
Oxyfluorfen	mg/kg dry wt	-	< 0.004	< 0.004	< 0.004	-
Paclobutrazol	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Parathion-ethyl	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Parathion-methyl	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Penconazole	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Pendimethalin	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Permethrin	mg/kg dry wt	-	< 0.003	< 0.003	< 0.003	-
Phorate	mg/kg dry wt	-	< 0.015	< 0.016	< 0.015	-
Phosmet	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Phosphamidon	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Pirimicarb	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Pirimiphos-methyl	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Prochloraz	mg/kg dry wt	-	< 0.04	< 0.04	< 0.04	-
Procymidone	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Prometryn	mg/kg dry wt	-	< 0.004	< 0.004	< 0.004	-
Propachlor	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Propanil	mg/kg dry wt	-	< 0.03	< 0.03	< 0.03	-
Propazine	mg/kg dry wt	-	< 0.004	< 0.004	< 0.004	-
Propetamphos	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Propham	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Propiconazole	mg/kg dry wt	-	< 0.006	< 0.006	< 0.006	-
Prothiofos	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Pyrazophos	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Pyrifenox	mg/kg dry wt	-	< 0.011	< 0.011	< 0.011	-
Pyrimethanil	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Pyriproxyfen	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Quintozene	mg/kg dry wt	-	< 0.015	< 0.016	< 0.015	-
Quizalofop-ethyl	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Simazine	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Simetryn	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Sulfentrazone	mg/kg dry wt	-	< 0.04	< 0.04	< 0.04	-
Sulfotep	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
TCMTB [2-(thiocyanomethylthio) benzothiazole,Busan]	mg/kg dry wt	-	< 0.015	< 0.016	< 0.015	-
Tebuconazole	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-

Sample Type: Soil						
Sample Name:		AB#6 (0.1) 06-Oct-2015 2:05 pm	AB#7 (0.1) 06-Oct-2015 2:15 pm	AB#8 (0.1) 06-Oct-2015 2:20 pm	AB#9 (0.1) 06-Oct-2015 2:25 pm	AB-Battery 06-Oct-2015 2:10 pm
Lab Number:		1485293.23	1485293.24	1485293.25	1485293.26	1485293.27
Multiresidue Pesticides in Soil samples by GCMS						
Tebufenpyrad	mg/kg dry wt	-	< 0.004	< 0.004	< 0.004	-
Terbacil	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Terbufos	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Terbumeton	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Terbuthylazine	mg/kg dry wt	-	< 0.004	< 0.004	< 0.004	-
Terbuthylazine-desethyl	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Terbutryn	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Tetrachlorvinphos	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Thiabendazole	mg/kg dry wt	-	< 0.04	< 0.04	< 0.04	-
Thiobencarb	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Thiometon	mg/kg dry wt	-	< 0.015	< 0.016	< 0.015	-
Tolylfluanid	mg/kg dry wt	-	< 0.004	< 0.004	< 0.004	-
Triadimefon	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Triazophos	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Trifluralin	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-
Vinclozolin	mg/kg dry wt	-	< 0.008	< 0.008	< 0.008	-

Sample Name:		Composite of AA#1 (0.1) + AA#2 (0.1) + AA#3 (0.1)	Composite of AA#4 (0.1) + AA#5 (0.1) + AA#6 (0.1)	Composite of AA#7 (0.1) + AA#8 (0.1) + AA#9 (0.1)	Composite of AA#10 (0.1) + AA#11 (0.1) + AA#12 (0.1)	Composite of AA#13 (0.1) + AA#14 (0.1) + AA#15 (0.1)
Lab Number:		1485293.28	1485293.29	1485293.30	1485293.31	1485293.32
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Recoverable Arsenic	mg/kg dry wt	12	22	12	10	8
Total Recoverable Cadmium	mg/kg dry wt	0.17	0.22	0.14	0.13	0.20
Total Recoverable Chromium	mg/kg dry wt	13	13	10	11	11
Total Recoverable Copper	mg/kg dry wt	18	18	11	11	15
Total Recoverable Lead	mg/kg dry wt	18.2	21	14.8	12.7	12.5
Total Recoverable Nickel	mg/kg dry wt	14	14	10	10	11
Total Recoverable Zinc	mg/kg dry wt	71	74	51	55	58

Sample Name:		Composite of AB#1 (0.1) + AB#2 (0.1) + AB#3 (0.1)	Composte of AB#4 (0.1) + AB#5 (0.1) + AB#6 (0.1)	Composite of AB#7 (0.1) + AB#8 (0.1) + AB#9 (0.1)		
Lab Number:		1485293.33	1485293.34	1485293.35		
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Recoverable Arsenic	mg/kg dry wt	10	11	11	-	-
Total Recoverable Cadmium	mg/kg dry wt	0.11	0.13	0.11	-	-
Total Recoverable Chromium	mg/kg dry wt	10	11	9	-	-
Total Recoverable Copper	mg/kg dry wt	10	10	10	-	-
Total Recoverable Lead	mg/kg dry wt	18.2	19.2	17.7	-	-
Total Recoverable Nickel	mg/kg dry wt	9	9	8	-	-
Total Recoverable Zinc	mg/kg dry wt	45	54	44	-	-

Analyst's Comments

It has been noted that the method performance for Iprodione for ONOP analysis is not acceptable therefore we are unable to report this compound at this present time.

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 clean 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.

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Environmental Solids Sample Preparation	Air dried at 35°C and sieved, <2mm fraction. Used for sample preparation. May contain a residual moisture content of 2-5%.	-	4, 16-17, 23, 27-35
Soil Prep Dry & Sieve for Agriculture	Air dried at 35°C and sieved, <2mm fraction.	-	27

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn	Dried sample, <2mm fraction. Nitric/Hydrochloric acid digestion, ICP-MS, screen level.	0.10 - 4 mg/kg dry wt	4, 16-17, 23, 27-35
Multiresidue Pesticides in Soil samples by GCMS	Sonication extraction, GC-MS analysis. Tested on as received sample, then results corrected to a dry weight basis using the separate Dry Matter result.	0.003 - 0.06 mg/kg dry wt	24-26
Organochlorine Pesticides Screening in Soil	Sonication extraction, SPE cleanup, dual column GC-ECD analysis (modified US EPA 8082).. Tested on dried sample	0.010 - 0.04 mg/kg dry wt	2, 5, 8, 11, 14, 19, 22
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. US EPA 3550. (Free water removed before analysis).	0.10 g/100g as rcvd	24-26
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	4, 16-17, 23, 27-35
Composite Environmental Solid Samples*	Individual sample fractions mixed together to form a composite fraction.	-	1-15, 18-26
pH*	1:2 (v/v) soil : water slurry followed by potentiometric determination of pH.	0.1 pH Units	27

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

Carole Rodgers-Carroll BA, NZCS
Client Services Manager - Environmental Division

Job No: 148 5293

Date Recv: 07-Oct-15 05:34

Received by: Jennifer Singlewood

3114852934

COMPOSITE SAMPLES		
Analysis	**ID**	**Date**
Heavy Metals Composite 1	AA#1(0.1)	6/10/2015
	AA#2(0.1)	
	AA#3(0.1)	
Heavy Metals Composite 2	AA#4(0.1)	
	AA#5(0.1)	
	AA#6(0.1)	
Heavy Metals Composite 3	AA#7(0.1)	
	AA#8(0.1)	
	AA#9(0.1)	
Heavy Metals Composite 4	AA#10(0.1)	
	AA#11(0.1)	
	AA#12(0.1)	
Heavy Metals Composite 5	AA#13(0.1)	
	AA#14(0.1)	
	AA#15(0.1)	
Heavy Metals Composite 6	AB#1(0.1)	
	AB#2(0.1)	
	AB#3(0.1)	
Heavy Metals Composite 7	AB#4(0.1)	
	AB#5(0.1)	
	AB#6(0.1)	
Heavy Metals Composite 8	AB#7(0.1)	
	AB#8(0.1)	
	AB#9(0.1)	

INDIVIDUAL SAMPLES		
Analysis	**ID**	**Date**
Heavy Metals and pH	AB-Battery	6/10/2015
Heavy Metals	ADUP#2	
Heavy Metals	ADUP#1	
OCP	AA#2(0.1)	
OCP	AA#5(0.1)	
OCP	AA#8(0.1)	
OCP	AA#11(0.1)	
OCP	AA#14(0.1)	
OCP	AB#2(0.1)	
OCP	AB#5(0.1)	
Heavy Metals	AA#4(0.1)	
Heavy Metals	AB#6(0.1)	
Multi residue pesticides	AB#7(0.1)	
Multi residue pesticides	AB#8(0.1)	
Multi residue pesticides	AB#9(0.1)	

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Web www.hill-labs.co.nz

Job Information Summary

Client:	Davis Consulting Group Limited	**Lab No:**	1485293
Contact:	Fiona Rowley	**Date Registered:**	07-Oct-2015 12:56 pm
	C/- Davis Consulting Group Limited	**Priority:**	High
	PO Box 2450	**Quote No:**	
	Wakatipu	**Order No:**	
	QUEENSTOWN 9349	**Client Reference:**	The Hills Area A+B 15063
		Add. Client Ref:	
		Submitted By:	Fiona Rowley
		Charge To:	Davis Consulting Group Limited
		Target Date:	15-Oct-2015 4:30 pm

Samples

No	Sample Name	Sample Type	Containers	Tests Requested
1	AA#1 (0.1) 06-Oct-2015 10:45 am	Soil	GSoil300	Composite Environmental Solid Samples
2	AA#2 (0.1) 06-Oct-2015 10:50 am	Soil	GSoil300	Composite Environmental Solid Samples; Organochlorine Pesticides Screening in Soil
3	AA#3 (0.1) 06-Oct-2015 10:55 am	Soil	GSoil300	Composite Environmental Solid Samples
4	AA#4 (0.1) 06-Oct-2015 11:00 am	Soil	GSoil300	Composite Environmental Solid Samples; Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn
5	AA#5 (0.1) 06-Oct-2015 11:05 am	Soil	GSoil300	Composite Environmental Solid Samples; Organochlorine Pesticides Screening in Soil
6	AA#6 (0.1) 06-Oct-2015 11:10 am	Soil	GSoil300	Composite Environmental Solid Samples
7	AA#7 (0.1) 06-Oct-2015 11:15 am	Soil	GSoil300	Composite Environmental Solid Samples
8	AA#8 (0.1) 06-Oct-2015 11:20 am	Soil	GSoil300	Composite Environmental Solid Samples; Organochlorine Pesticides Screening in Soil
9	AA#9 (0.1) 06-Oct-2015 11:25 am	Soil	GSoil300	Composite Environmental Solid Samples
10	AA#10 (0.1) 06-Oct-2015 11:30 am	Soil	GSoil300	Composite Environmental Solid Samples
11	AA#11 (0.1) 06-Oct-2015 11:35 am	Soil	GSoil300	Composite Environmental Solid Samples; Organochlorine Pesticides Screening in Soil
12	AA#12 (0.1) 06-Oct-2015 11:40 am	Soil	GSoil300	Composite Environmental Solid Samples
13	AA#13 (0.1) 06-Oct-2015 11:45 am	Soil	GSoil300	Composite Environmental Solid Samples
14	AA#14 (0.1) 06-Oct-2015 11:50 am	Soil	GSoil300	Composite Environmental Solid Samples; Organochlorine Pesticides Screening in Soil
15	AA#15 (0.1) 06-Oct-2015 11:55 am	Soil	GSoil300	Composite Environmental Solid Samples
16	A Dup #1 06-Oct-2015 11:01 am	Soil	GSoil300	Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn
17	A Dup #2 06-Oct-2015 2:06 pm	Soil	GSoil300	Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn
18	AB#1 (0.1) 06-Oct-2015 1:40 pm	Soil	GSoil300	Composite Environmental Solid Samples
19	AB#2 (0.1) 06-Oct-2015 1:45 pm	Soil	GSoil300	Composite Environmental Solid Samples; Organochlorine Pesticides Screening in Soil
20	AB#3 (0.1) 06-Oct-2015 1:50 pm	Soil	GSoil300	Composite Environmental Solid Samples
21	AB#4 (0.1) 06-Oct-2015 1:55 pm	Soil	GSoil300	Composite Environmental Solid Samples
22	AB#5 (0.1) 06-Oct-2015 2:00 pm	Soil	GSoil300	Composite Environmental Solid Samples; Organochlorine Pesticides Screening in Soil
23	AB#6 (0.1) 06-Oct-2015 2:05 pm	Soil	GSoil300	Composite Environmental Solid Samples; Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn
24	AB#7 (0.1) 06-Oct-2015 2:15 pm	Soil	GSoil300	Composite Environmental Solid Samples; Multiresidue Pesticides in Soil samples by GCMS
25	AB#8 (0.1) 06-Oct-2015 2:20 pm	Soil	GSoil300	Composite Environmental Solid Samples; Multiresidue Pesticides in Soil samples by GCMS
26	AB#9 (0.1) 06-Oct-2015 2:25 pm	Soil	GSoil300	Composite Environmental Solid Samples; Multiresidue Pesticides in Soil samples by GCMS
27	AB-Battery 06-Oct-2015 2:10 pm	Soil	GSoil300	pH; Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn
28	Composite of AA#1 (0.1) + AA#2 (0.1) + AA#3 (0.1)	Soil	GSoil300	Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn

Samples

No	Sample Name	Sample Type	Containers	Tests Requested
29	Composite of AA#4 (0.1) + AA#5 (0.1) + AA#6 (0.1)	Soil	GSoil300	Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn
30	Composite of AA#7 (0.1) + AA#8 (0.1) + AA#9 (0.1)	Soil	GSoil300	Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn
31	Composite of AA#10 (0.1) + AA#11 (0.1) + AA#12 (0.1)	Soil	GSoil300	Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn
32	Composite of AA#13 (0.1) + AA#14 (0.1) + AA#15 (0.1)	Soil	GSoil300	Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn
33	Composite of AB#1 (0.1) + AB#2 (0.1) + AB#3 (0.1)	Soil	GSoil300	Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn
34	Composte of AB#4 (0.1) + AB#5 (0.1) + AB#6 (0.1)	Soil	GSoil300	Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn
35	Composite of AB#7 (0.1) + AB#8 (0.1) + AB#9 (0.1)	Soil	GSoil300	Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn

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 clean 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.

Sample Type: Soil

Test	Method Description	Default Detection Limit	Sample No
Environmental Solids Sample Preparation	Air dried at 35°C and sieved, <2mm fraction. Used for sample preparation. May contain a residual moisture content of 2-5%.	-	4, 16-17, 23, 27-35
Soil Prep Dry & Sieve for Agriculture	Air dried at 35°C and sieved, <2mm fraction.	-	27
Heavy metal screen level As,Cd,Cr,Cu,Ni,Pb,Zn	Dried sample, <2mm fraction. Nitric/Hydrochloric acid digestion, ICP-MS, screen level.	0.10 - 4 mg/kg dry wt	4, 16-17, 23, 27-35
Multiresidue Pesticides in Soil samples by GCMS	Sonication extraction, GC-MS analysis. Tested on as received sample, then results corrected to a dry weight basis using the separate Dry Matter result.	0.003 - 0.06 mg/kg dry wt	24-26
Organochlorine Pesticides Screening in Soil	Sonication extraction, SPE cleanup, dual column GC-ECD analysis (modified US EPA 8082).. Tested on dried sample	0.010 - 0.04 mg/kg dry wt	2, 5, 8, 11, 14, 19, 22
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. US EPA 3550. (Free water removed before analysis).	0.10 g/100g as rcvd	24-26
Total Recoverable digestion	Nitric / hydrochloric acid digestion. US EPA 200.2.	-	4, 16-17, 23, 27-35
Composite Environmental Solid Samples	Individual sample fractions mixed together to form a composite fraction.	-	1-15, 18-26
pH	1:2 (v/v) soil : water slurry followed by potentiometric determination of pH.	0.1 pH Units	27

Replacement Attachment Received 5 November 2015

Proposed Rural Lifestyle Zone A (Hogans Gully) Zone

Assessment of Landscape and Visual Effects

October 2015

Contents

Background and Approach

Boffa Miskell Limited (BML) has been commissioned to assess the landscape and visual effects of the development that would be enabled under the proposed Rural Lifestyle Zoning for land located on the corner of Hogans Gully and the Arrowtown-Lake Hayes Roads.

It is noted that BML provided advice on the proposed rezoning, including the proposed rules and measures required to mitigate any landscape effects, during the formulation of the proposal.

A zone plan has been prepared by Darby Partners (see **Figure 2** of the Graphic Attachment). The proposed design and mitigation measures, are described in this report, in so far as they are relevant to this assessment.

A site visit was undertaken to assess the existing landscape on and surrounding the site, as well as the potential visibility of the proposal in relation to existing development and from public viewpoints. These on-site investigations were carried out on Sept 7 2015. The photographic record forms part of the landscape assessment (refer to the supporting **Graphic Supplement for Proposed Rural Lifestyle Area A**).

A description of the existing landscape character of the Site and surrounding landscape, including the land cover and existing development, forms the first part of the landscape assessment. Secondly, a landscape assessment is provided, which is based on the visibility analysis. The assessment provides a short description of the landscape's potential to absorb change in terms of visibility as well as the potential effects on the character of the landscape that may arise as a result of development enabled by the proposed rezoning occurring.

A review of the proposed District Plan provisions relating to landscape is included in this assessment. A review of the proposed Zone provisions that will apply to the Site if the proposed rezoning is confirmed is also provided to ensure that the appropriate landscape outcomes can be achieved.

Description of the Existing Environment

Site Location

The Site is located in the north eastern corner of Wakatipu Basin, on the south western side of the Arrowtown township. The Site is part of a larger landholding, which includes the Hills golf course. . The larger landholding is a triangular shaped property encompassing a total of 190 hectares and extends between Arrowtown-Lake Hayes Road in the west to McDonnell Road in the east, and Hogan Gully Road in the south. The site of the proposed Rural Lifestyle Zoning, the subject of this report, is approximately 20ha and is located at the intersection of Hogans Gully and Arrowtown-Lake Hayes Roads, within the south-western corner of the larger landholding.

Existing Landscape Context and Character Values

The surrounding topography of the north eastern corner of Wakatipu Basin is varied and of high visual diversity. Arrowtown Township is contained to the east by the slopes of the Crown Range Terrace and to the north by Brow Peak/German Hill. The township is nestled below the slopes along the Arrow River, which enters the Wakatipu Basin at this point. The small-scale glacial landform of Feehly Hill, with its popular scenic reserve, lies to the north of the Site property, adjacent to the developed areas of Arrowtown.

The existing Millbrook Resort and golf course is located on the western side of Arrowtown-Lake Hayes Road. The design of the landscaping within the resort has similarities to the Hills' golf course, and the rolling terrain provides similarly manicured but diverse landscape characteristics.

The Arrowtown escarpment extends along the township and along its southern part it forms the current urban boundary for the township. This prominent landscape feature contains residential development along the northern 900 metres of McDonnell Road, which creates a strong residential character along this stretch of road. South of this developed section the road extends through a more rural landscape[1], with views to prominent dwellings along the top edge of the escarpment.

The Hills golf course which is located on the western side of McDonnell Road, contains varied terrain with clusters of exotic and native trees and shrubs, areas of tussock grassland, sand bunkers and small ponds interspersed between the holes. The setting is of high aesthetic quality and designed and maintained to the highest standards. While significant earthworks have occurred as part of the establishment of the golf course, the appearance of the property provides a high level of visual amenity and a semi-rural outlook for Arrowtown residences located along the western escarpment of the township (Cotter Ave and Advance Terrace).

The Hills golf course also contains a number of existing dwellings on the southern and eastern side of the property. These buildings are predominantly set within well-established clusters of vegetation and are difficult, if not impossible to see from outside the property.

The south eastern corner of the larger landholding property, on the intersection of Arrowtown-Lake Hayes Road and Hogans Gully Road, comprises a block of land that is visually separated from the Hills golf course, by a distinctive change in elevation. This area is proposed to be rezoned Rural Lifestyle, and is the subject of this landscape assessment, (referred to throughout this report as Proposed Rural Lifestyle Area A).

Site Appraisal (Proposed Rural Lifestyle Area A)

The Proposed Rural Lifestyle Area A (also referred to as the Site in this assessment) is an approximately 20 hectare area of pastoral land that is roughly rectangular in shape and, as previously noted, is bounded by the Arrowtown- Lake Hayes Road to the west and Hogans Gully Road to the south.

[1] Although it is noted that a recent Environment Court decision (Decision [2015]NZEnvC 25 *Cook Adam Trustees Limited & R Monk v Queenstown Lakes District Council*) has approved an area known as Arrowtown Special Zone, which encompass a 30ha area south of Arrowtown along the eastern side of McDonnell Road below Advance Terrace where urban density residential dwellings will be located.

The base of a small terrace rising to the north forms of the northern boundary of the Site. To the east, the boundary extends along a post and rail fence which separates two paddocks and connects with a vegetated boundary associated with an adjacent residential dwelling, accessed off of Hogans Gully Road.

The Site is broadly flat, however the terraces to the north assist in curtailing views towards the Site to varying degrees. These terraces currently contain residential dwellings that are largely out of view from stretches of Arrowtown- Lake Hayes Road due to the screening landform.

The Site does not contain any buildings, other than a small agricultural shed. A line of poplars partially divides the Site unevenly in two close to the Site's eastern boundary.

Proposal Description

In summary, the proposal is to rezone the Site from Rural (under the Operative District Plan) to a Rural Lifestyle Zone. This zoning would enable the creation of up to 10 lots at 2 hectare average density subject to subdivision consent being obtained.

The topography of the Site is flat farmland, with the terrace escarpment rising to the north of the Site towards the Hills golf course. To the west, on the other side of Lake Hayes Road is zoned Rural Residential and Rural General in the operative District Plan. To the south, on the other side of Hogans Gully Road is zoned Rural Lifestyle.

The proposal Rural Lifestyle zoning seeks to continue the existing settlement pattern in the area. As noted, this zoning would allow up to 10 lots at 2 hectare density. Dwellings would be allowed up to 8m in height, and would be subject to the design requirements in the Proposed District Plan relating to building materials and colours, building size, and setbacks, and to QLDC's Guide to Suitable Building Colours and Materials in Rural Zones[2].

It is proposed that as part of the subdivision consent, a subdivision plan will identify buildings platforms, internal lot boundaries and access ways. In addition, a Landscape Management Plan will be required to show the planting framework. This plan will include the Landscape Amenity Management Area (LAMA) as indicated on the proposed structure plan. This area is 112m in width to the east of the proposed access to the Hills Resort Zone (which is addressed in a separate report), and 75m width to the west.

The purpose of the LAMA is to preserve views of the surrounding landscape from public roads while partially screening, or visually softening proposed dwellings through landscape treatment. The setback also allows a zone of open space / landscaping to ensure that dwellings will not be overly prominent or close to the road and preserves rural character.

Landscape treatment within the LAMA is intended to include predominantly deciduous tree and hedge planting, with no dwellings to be located in this area. The Landscape Management Plan will ensure that the planting will be rural in character rather than an overly domesticated appearance.

[2] http://www.qldc.govt.nz/assets/Uploads/Forms/Resource-Consents/FAQs-and-Guides/QLDC-Guidance-Document-Light-Reflectance-Feb15.pdf

Assessment of Landscape and Visual Effects

The following sections address the potential landscape and visual effects of the proposed rezoning, assuming the land is developed in accordance with that zoning. The assessment provides:

(i) A description of the Site's ability to absorb change based on existing landform and vegetation;
(ii) An analysis of potential visibility from public and private places;
(iii) An assessment of recommended mitigation and enhancement measures to address any potential landscape and visual effects; and
(iv) Finally, a conclusion about the anticipated landscape effects is drawn.

Assessment of Effects on Landscape Values

In general terms, landscape and visual impacts result from natural or induced change in the components, character or quality of the landscape. Usually these are the result of landform or vegetation modification or the introduction of new structures, facilities or activities. All these impacts are assessed to determine the effects of the change on landscape character and quality, rural amenity and on public and private views.

In this assessment the potential effects are based on a combination of the landscape's sensitivity and visibility (i.e. its ability to absorb change) and the nature and scale of the proposed development. Particular effects considered in this assessment are:

- Effects on landscape and rural character (i.e. 'landscape effects');
- Visual effects from private and public locations (i.e. 'visual effects').

Several mitigation measures form part of the proposal, which are based on recommendations made by BML and Darby Partners during the formulation of the proposal, to address potential landscape and visual effects. The proposed mitigation mainly consists of a LAMA with native and exotic plantings, which have been described in the outline of the proposal, along with controls on building design and materials etc. The implementation of these measures has been taken into account when reaching conclusions on landscape and visual effects.

Landscape and Rural Character

In general terms, landscape character is the distinct and recognisable pattern of elements that occurs consistently in a particular landscape. It reflects particular combinations of geology, landform, soils, vegetation, land use and human settlement. It creates the unique sense of place of different areas of the landscape.

The analysis of landscape character sensitivity is based on judgments about sensitivity of aspects of landscape character most likely to be affected by a proposal.

These aspects include natural and cultural factors, quality/condition of the landscape and aesthetic factors.

Visual sensitivity means the visibility of an area, as well as the nature and extent of the population likely to visually experience the area.

In terms of this proposal, the Site is in a contained location between Arrowtown and Lake Hayes, within a predominantly rural residential environment (Rural Residential Zoning on Speargrass Flat Road and Rural Lifestyle zoning on the opposite side of Hogans Gully Road.).

The broader basin landscape is characterised by a mix of land uses, comprising golf courses, the Arrowtown township, rural agricultural land and a mix of rural residential developments.

There are numerous roads that traverse this area, all of which retain relatively high levels of amenity.

The landscape is gently undulating, accentuated by pockets and stands of vegetation. The openness of the wider landscape is aligned with other typical rural landscapes found throughout the district.

The existing topography and vegetation assist in controlling views throughout this predominantly rural residential landscape. The rural character is also under transition, where new developments are further changing the characteristics of this eastern Wakatipu Basin landscape.

Based on the underlying character of the area, and noting its transition, it is considered that the proposed rezoning of the Site is appropriate from a landscape and rural character perspective for several reasons, namely:

- The Site, as outlined above, lies relatively close to Arrowtown, within a part of the wider landscape of the Wakatipu Basin, where a mix of rural residential and other rural-related activities occur together;
- The Site is relatively visually contained, due to its location at the base of a small escarpment which blocks views to the Site from north and east. The existing vegetation and shelterbelt plantings on surrounding properties assists in curtailing private views from the Speargrass Flat area.
- The proposed 75m and 112m LAMAs along with the proposed controls on the density of the development (2ha average lot size) will assist in maintaining the openness of the Site when travelling on the Arrowtown- Lake Hayes Road. Clustered tree and shrub planting is anticipated in a naturalistic patterns amongst grass and tussocks in the Landscaping Areas. This, along with the design measures required under the Rural Lifestyle zoning will assist with absorbing the proposal into its landscape setting and maintaining the openness of the area;
- Rural Residential subdivision is not an uncharacteristic land use activity in the locality.

Notwithstanding the above, if the proposed rezoning of the Site is confirmed, there will be a change in the landscape character of the Site, however it is considered the change will not be out of character with the surrounding area, for the reasons described above.

In order to reduce the potential visual impact of the proposal, a wide landscaped setback for dwellings (LAMA) is proposed from the adjacent roads. Here, tree and shrub planting is proposed which will assist in screening the houses to varying degrees whilst maintaining high levels of openness. No linear screen planting is proposed in this area, as it would reduce the openness of the Site and views beyond.

It is considered that the landscape and rural character effects of the rezoning would be of a similar nature to change that has already occurred along Speargrass Flat Road, and which will inevitably

occur on the opposite of Hogans Gully Road under the Rural Lifestyle zoning which applies to that land. This part of the Wakatipu Basin is visually contained by landform and the change, would not impact on the landscape values experienced within the wider basin.

Visual Amenity

In general terms, visual amenity effects are influenced by a number of factors including the nature of the proposal and the landscape's absorption capability, and the character of the site and the surrounding area. Visual amenity effects are also dependent on distance between the viewer and the proposal, the complexity of the intervening landscape and the nature of the view.

Visual sensitivity covers the visibility of an activity area as well as the nature and extent of population likely to visually experience the area (e.g. private/ public viewpoints).

In terms of this proposal, to assist with determining the visibility of the Site, a series of **Site Context Photographs 1-4** have been taken from areas that can be publicly accessed. These include roads and elevated walking/biking tracks. The photos were taken during winter, when the deciduous trees are not in leaf, therefore maximising the Site's visibility. These are contained within the Graphic Supplement attached to and forming part of this report.

Two representative elevated viewpoints around Arrowtown (Feehly Hill and top of Tobins Track on the Crown Terrace) were assessed and assumptions about visibility from private properties were made based on an assessment from nearby public viewpoints, such as roads.

While the majority of the Site is reasonably contained and much of the proposed development will be screened by landform or vegetation when viewed from surrounding roads, other parts will be visible from different viewpoints, including long distance elevated views such as Tobins Track. The visibility analysis is informed by the mapping of the Zone of Visual Influence (ZVI), prepared by Darby Partners (Refer Graphic Attachment to Master Planning Report).

However, the on-site investigations carried out for the assessment (7 October 2015), form the primary basis for the visibility analysis. Findings from the visibility analysis form the basis for the assessment of visual effects.

The descriptors used for this visibility analysis are as follows:

Viewpoint distances:

- Long distance: more than 1.0 km (e.g. top of Tobins Track)
- Mid distance: 500m – 1.0km (e.g. some of the surrounding houses)
- Short distance: less than 500m (e.g. Hogans Gully Road, Arrowtown-Lake Hayes Road)

Visibility:

- Low: viewed from mid to long distance, partly visible (less than half of the building)
- Medium: viewed from mid distance, partly visible (more than half of the building)
- High: viewed from short to mid distance, partly or fully visible (more than half of the building)

Visual Effects from Private Houses

An assessment of the visual prominence of the proposal from existing houses or groups of houses that abut or are within a close distance to the Site was undertaken. This assessment assigned a degree of effect, based on the following:

- Visibility and proximity to the Site (in particular to the nearest built up edge within the Site).
- The apparent orientation of the existing house from where the view is gained.
- The nature of the view including any existing or proposed vegetation that might provide full or partial screening of views to the Site; and
- The assessment is based on observations from public roads and use of aerial photos, as no visits were made to the existing houses in proximity of the Site. The assessment also takes into account the planting proposed to be undertaken/required and assumes that vegetation will mature over time providing added mitigation or screening.

Visual prominence was assessed on a five point scale as follows:

- Very low or negligible.
- Low or less than minor.
- Moderate.
- High.
- Very high.

There are a number of houses located within proximity of the Site. These houses are referenced by letters on **Figure 4** of the Graphic Supplement. These include residences to the west of the Site (Houses A & B) located off Speargrass Flat Road, those to the south (Houses C, D and E), those to the north (Houses F and G as well as House H which is located within the Hills golf course area, as well as the house located to the immediate east of the Site (House I). Longer distance views are also obtained to the Site from elevated parts of Tobins Track/ northern Crown Terrace (but not from the Crown Range Road).

Of those properties located on the flat land to the immediate west of the Site (i.e. along Speargrass Flat Rd, beyond Arrowtown- Lake Hayes Road – Houses A and B), all are surrounded by mature vegetation, which curtails views towards the Site.

Much of this curtailing of views by mature vegetation located along property boundaries also affects the visibility of the Site from houses to the south and, to varying degrees from houses to the immediate north when observing the Site. Regarding the houses to the South (Houses C, D and E) all are set back from Hogans Gully Road, where intervening vegetation and terrain assists in screening the Site. It is unlikely that existing dwellings on the southern side of Hogans Gully Road would gain views of the proposed development area within the Site (i.e. beyond the LAMA), due to topographical variation. Furthermore, these properties are located approximately 400 metres from the southern boundary of the Site and existing vegetation is also present along much of their boundaries, also assisting in curtailing views.

The elevated houses to the north (Houses F, G and H) will potentially receive glimpsed views towards the Site, however, due to their setback from the edge of the terrace, views will be limited. Property H

is located within the Hills golf course area property and surrounded along it its southern boundary by mature vegetation which assists in curtailing views towards the Site.

To the immediate east of the Site is a lifestyle property (House I) which is set back approximately 70 metres from Hogans Gully Road. This house is illustrated in Figure 6, **Site Context Photograph 3**. Although vegetation assists in partially screening this property, the house is evident from the Site, and orientates towards the Site. Due to the close-distance of this property and its lack of screening, it is envisaged that this property will experience moderate visual effects. There is an opportunity to mitigate this by softening the view by plantings within the LAMA.

In long distance views (over 3km), elevated views, such as those from the top of Tobins Track (refer to Figure 6, **Site Context Photograph 4**), the Site will appear as a small component of the larger panorama. Visual effects are considered to be negligible from these viewpoints.

Visual Effects from Roads – Hogans Gully Road

Open transitory views are obtained of the entire Site from the western extent of Hogans Gully Road (only approximately 570m) due to currently limited or no screening from vegetation or topography along the Site boundary. When travelling west-bound along Hogans Gully Road from the east, there are a number of houses that are accessed off this road, including House I. House I, along with topographical variation and boundary planting, assist in partially screening of views towards the Site. Essentially the Site comes into view as one passes the House I to the east of the Site. A typical view past this property to the Site is **Figure 6, Site Context Photograph 3**.

Given these transitory views, with the proposed LAMA in place, it is considered that the visual effects from Hogans Gully Road will be moderate along a 570m long stretch (i.e. adjacent to the Site's southern boundary) but reducing to minor as the vegetation in the LAMA matures.

Visual Effects from Roads – Arrowtown – Lake Hayes Road

When travelling north along the Arrowtown-Lake Hayes Road, the Site comes into view at the entrance way to House C, some 300m south of the intersection with Hogans Gully Road and Speargrass Flat Road. Views to the Site south of this point are curtailed by intervening trees and topographic variation.

When travelling southbound, a gentle bend in the road, coupled with intervening terrain and mature trees planted along the eastern side of the carriageway, prevent views of the Site from being obtained until one reaches the boundary of the Site. Figure 5, **Site Context Photograph 1** illustrates the first open view one receives when travelling south bound of the Site. Figure 5, **Site Context Photograph 2** illustrates a view further southwards from **Site Context Photograph 1**, demonstrating the open nature of the boundary.

The total visible extent of the Site from Arrowtown- Lake Hayes Road is approximately 700m traveling in either direction. Due to the open eastern boundary of the Site, direct views are obtained across the Site, with only a small cluster of existing mature polar trees providing any screening.

With the LAMA in place, it is considered that the transitory visual effects from this road will be moderate along the 700m long stretch of road where development on the Site would be visible.

Visual Effects from other Roads

Views towards the Site from Speargrass Flat Road are, on the whole truncated due to vegetation flanking both sides of the Road. It is only at the last 70 metres or so when the Site becomes partially apparent. Transitory visual effects are therefore considered to be less than minor from this road.

Visual Effects Summary

Based on the visibility analysis, it is considered that due to the Site's relatively confined setting, on flat land at the base of a small escarpment, views are limited to the immediate context, including short sections of Arrowtown- Lake Hayes Road and Hogans Gully Road. Intervening vegetation and topographical variation assist in reducing visibility.

Of the residential properties likely to have views of the future development on the Site, only the house to the immediate east of the Site (House I) will experience moderate visual effects, principally due to its close location to the Site and due to the lack of existing vegetation screening views. The moderate effect rating takes into account that the 112m wide LAMA which will assist to keep any new houses in the proposed Rural Lifestyle zone away from this property's immediate boundaries, ensuring that the proposed houses are set back from the house and that views to built form are softened by vegetation and plantings.

The effects on long distance views from Tobins Track (over 3km away) are negligible, as the Site will appear as a small component to the overall panorama and be seen as part of the broader landscape, as illustrated in **Site Context Photograph 4**.

Statutory Context

In accordance with Section 32 of the Resource Management Act 1991 ('RMA'), this part of the report addresses the following statutory documents which are relevant to the assessment of this proposal (as relevant):

- Part II of the RMA;
- The Proposed Queenstown Lakes District Plan;
- The provisions of the proposed Rural Lifestyle Zone.

Part II of the RMA

Part II of the RMA sets out the purpose and principles of the Act (**Sections 6-8**). Section 6 requires the matters listed in the section to be recognised and provided for as "matters of national importance". The only section 6 matter potentially of relevance to this proposal is:

> *(b) The protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development.*

There are no outstanding natural landscapes or features within or close to the Site. Therefore there are no matters of national importance relevant to this assessment.

Section 7 of the RMA identifies "other matters" to which particular regard must be had when assessing this proposal.

The section 7 matters considered potentially relevant to this proposal are:

> *(b) The efficient use and development of natural and physical resources.*
>
> *(c) The maintenance and enhancement of amenity values.*
>
> *(f) Maintenance and enhancement of the quality of the environment.*

These matters are discussed below within the assessment of the objectives and policies of the Proposed Plan as notified, and the provisions of the proposed Rural Lifestyle Zone.

Proposed District Plan (as relevant)

Chapter 3 Strategic Directions:

Relevant objectives and policies under 3.2.5 Goal - Our distinctive landscapes are protected from inappropriate development

> *3.2.5 Goal - Our distinctive landscapes are protected from inappropriate development.*
>
> *Objective 3.2.5.3 Direct new subdivision, use or development to occur in those areas which have potential to absorb change without detracting from landscape and visual amenity values.*
>
> *Objective 3.2.5.4 Recognise there is a finite capacity for residential activity in rural areas if the qualities of our landscape are to be maintained.*
>
> *Policy 3.2.5.4.1 Give careful consideration to cumulative effects in terms of character and environmental impact when considering residential activity in rural areas.*
>
> *Policy 3.2.5.4.2 Provide for rural living opportunities in appropriate locations.*
>
> *Objective 3.2.5.5 Recognise that agricultural land use is fundamental to the character of our landscapes.*
>
> *Policy 3.2.5.5.2 Recognise that the retention of the character of rural areas is often dependent on the ongoing viability of farming and that evolving forms of agricultural land use which may change the landscape are anticipated.*

The existing environment comprises a mix of land uses, including golf courses, the Arrowtown township, rural agricultural land and a mix of rural residential style developments.

The location of the Proposed Rural Lifestyle Area at the foot of a small local escarpment and at the junction of two roads on flat land, coupled with generous landscape set-backs, has the potential to absorb development without detracting from the broader landscape and visual amenity values. The LAMA will ensure that the proposed dwellings are at sufficient distance from principal viewing areas (i.e. roads). The 2ha average lot size for dwellings will provide a similar landscape character to the existing developments along Speargrass Road, and future development on the opposite side of Hogans Gully Road.

It is acknowledged that there is a finite capacity for residential activity in rural areas. The Site is located within an area where there is existing residential development, and contained by both

vegetation and topographical variation. It is considered that whilst the openness of the Site will be affected by the proposed development, it will be affected at only a local degree, principally due to its containment. The proposed development will be read as part of the Speargrass Road and southern Hogans Gully Road developments, where residential development is already present, set within mature vegetated areas.

Cumulatively, the proposed development will build upon the existing and emerging character of the area. Whilst there will be cumulative effects, these will be localised and will not be significant. Whilst further residential development will be apparent as a result of the rezoning, the 2ha average density lot sizes, coupled with the landscaping proposed is in character with rural-lifestyle areas surrounding the Site.

Based on this, it is considered that the proposal has been located appropriately within a visually confined part of the basin, where existing vegetation and topographical variation positively contributes to the ability of the Site to absorb change without degrading the surrounding rural and rural-residential characteristics.

Chapter 6 Landscape:

> *6.3.1 Objective - The District contains and values Outstanding Natural Features, Outstanding Natural Landscapes, and Rural Landscapes that require protection from inappropriate subdivision and development.*
>
> > *6.3.1.6 Enable rural lifestyle living through applying Rural Lifestyle Zone and Rural Residential Zone plan changes in areas where the landscape can accommodate change.*
> >
> > *6.3.1.8 Ensure that the location and direction of lights does not cause glare to other properties, roads, and public places or the night sky.*
> >
> > *6.3.1.11 Recognise the importance of protecting the landscape character and visual amenity values, particularly as viewed from public places.*

The Site is not in and ONL, ONF, nor will it be a Rural Landscape if the proposed rezoning is approved. Objective 6.3.1 is therefore not relevant to this assessment.

It is considered that this proposed Rural Lifestyle Zone is appropriate in this location and that the landscape can accommodate change without adversely affecting the wider rural and rural-residential characteristics and high levels of rural amenity. The proposal recognises the importance of the openness and visual amenity experienced from public places (notably roads). The proposed houses will be located away from the more sensitive edges of the Site and will be of a density consistent with the Rural Lifestyle Zone.

For external lighting, down lights are proposed to minimise visibility. While lights from some of the buildings will be seen from outside the property, the impact in the context of the township is considered to be minimal.

It is considered that the landscape character and visual amenity of the Site, when viewed from surrounding viewpoints, including public and private places, can be maintained under this particular proposal.

> *6.3.2 Objective - Avoid adverse cumulative effects on landscape character and amenity values caused by incremental subdivision and development.*

Policies 6.3.2.1 Acknowledge that subdivision and development in the rural zones, specifically residential development, has a finite capacity if the District's landscape quality, character and amenity values are to be sustained.

6.3.2.2 Allow residential subdivision and development only in locations where the District's landscape character and visual amenity would not be degraded.

6.3.2.4 Have particular regard to the potential adverse effects on landscape character and visual amenity values from infill within areas with existing rural lifestyle development or where further subdivision and development would constitute sprawl along roads.

6.3.2.5 Ensure incremental changes from subdivision and development do not degrade landscape quality, character or openness as a result of activities associated with mitigation of the visual effects of proposed development such as screening planting, mounding and earthworks.

It is acknowledged that the landscape in which the Site is located retains high amenity values and that the sensitive location of any new development is paramount in ensuring that the values that underpin the character of the area are not lost or degraded.

The proposal for the Site has been carefully considered to ensure that the current high amenity of the Speargrass Flat valley is maintained. Whilst there will be a change in land use, it is considered that the proposal will build upon the existing rural residential characteristics of the surrounding environment.

In terms of cumulative effects, the currently existing dwellings in proximity to the Site are screened by existing dense amenity and shelterbelt planting, which means they are not visible from the Arrowtown Lakes Hayes Road. The cumulative effects of the proposal are therefore largely restricted to the buildings within the proposed Site itself and the dwelling adjacent to the east. Some cumulative effects can be expected in terms of domestication of the Speargrass Flat valley, which would continue to extend further east, across Arrowtown Lake Hayes Road, if the proposed rezoning is confirmed. However, the area on the southern side of Hogans Gully Road is already zoned Rural Lifestyle meaning that the character of this environment will change regardless of whether the proposed rezoning of the Site is approved. Rural Lifestyle is the character of the area already, which will in the future change and become more domesticated. This proposal is in character with this future environment, and will not degrade it further. The proposed rezoning will mean that similar landscape outcomes will be implemented in the fourth quadrant of the road intersection. It is considered that the proposed development is not inappropriate because Speargrass Valley is a confined valley that has particular visual characteristics which make it more suitable to this form of development than other more open areas in the Wakatipu Basin. No further lifestyle development could be expected following this rezoning, since the adjacent terraces that define the area would not allow it due to the landform constraints.

Policies 6.3.5.2 Avoid adverse effects from subdivision and development that are:

- *Highly visible from public places and other places which are frequented by members of the public generally (except any trail as defined in this Plan); and*
- *Visible from public roads.*

6.3.5.3 Avoid planting and screening, particularly along roads and boundaries, which would degrade openness where such openness is an important part of the landscape quality or character.

6.3.5.4 Encourage any landscaping to be sustainable and consistent with the established character of the area.

6.3.5.5 Encourage development to utilise shared accesses and infrastructure, to locate within the parts of the site where they will be least visible, and have the least disruption to the landform and rural character.

6.3.5.6 Have regard to the adverse effects from subdivision and development on the open landscape character where it is open at present.

These provisions may apply only to Rural Zoned land, in which case they will not be relevant if the land is rezoned as sought. Nonetheless it is considered the proposal achieves these provisions. Whilst the openness of the Site will be reduced to some extent, open views from both short-sections of Arrowtown – Lake Hayes Road and Hogans Gully Road will be maintained through the use of LAMA, which will not be densely planted. The rural character of the Site will change to a more domesticated nature, but it is not considered out-of-character with the surrounding area which is largely rural-residential. The location of the Site at the toe of a small local escarpment assists in containing the Site, both visually and in terms of constraining further development. Further containment is provided by existing vegetation that is located in the vicinity of the Site. The proposed houses will not break the skyline in views, therefore limiting their visual dominance in the landscape. The proposed low density 10 Lot development of this 20 hectare Site, in conjunction with the LAMA, will ensure that the houses within the lots are located away from principal viewing areas (i.e. Arrowtown- Lake Hayes Road and Hogans Gully Road) and they will be developed using a suite of design measures to mitigate their visual presence.

Proposed Rural Lifestyle Zone Provisions

QLDC has prepared a Proposed Rural Residential and Rural Lifestyle chapter as part of its review of the operative District Plan. Under the proposed chapter, dated August 2015, the commentary under Rural Lifestyle Zone states:

'The Rural Lifestyle zone provides for rural living opportunities, having a development density of one residential unit per hectare with an overall density of one residential unit per two hectares across a subdivision. Building platforms are identified at the time of subdivision to manage the sprawl of buildings, manage adverse effects on landscape values and to manage other identified constraints such as natural hazards and servicing. The potential adverse effects of buildings are controlled by height, colour and lighting standards…..

….Many of the Rural Lifestyle zones are located within sensitive parts of the district's distinctive landscapes. While residential development is anticipated within these zones, provisions are included to manage the visual prominence of buildings, control residential density and generally discourage commercial activities. Building location is controlled by the identification of building platforms, bulk and location standards and, where required, design and landscaping controls imposed at the time of subdivision'.

The relevant objectives and policies for the zone provide:

*Objective 22.2.*1 *Maintain and enhance the district's landscape quality, character and visual amenity values while enabling rural living opportunities in areas that can avoid detracting from those landscapes.*

Policies

22.2.1.1 Ensure the visual prominence of buildings is avoided, particularly development and associated earthworks on prominent slopes, ridges and skylines.

22.2.1.2 Set minimum density and building coverage standards so the open space, natural and rural qualities of the District's distinctive landscapes are not reduced.

22.2.1.3 Allow for flexibility of the density provisions, where design-led and innovative patterns of subdivision and residential development, roading and planting would enhance the character of the zone and the District's landscapes.

22.2.1.5 Maintain and enhance landscape values by controlling the colour, scale, location and height of permitted buildings and in certain locations or circumstances require landscaping and vegetation controls.

22.2.1.6 Have regard to the location and direction of lights so they do not cause glare to other properties, roads, public places or the night sky.

Objective 22.2.2 - Ensure the predominant land uses are rural, residential and where appropriate, visitor and community activities.

Policy

22.2.2.2 Any development, including subdivision located on the periphery of residential and township areas, shall avoid undermining the integrity of the urban rural edge and where applicable, the urban growth boundaries.

The proposal will adhere to the density requirements of the Rural Lifestyle zone. All building locations will be identified on a Structure Plan and supplemented by a suite of measures outlining the design (i.e. materials, colours, setbacks) and landscaping requirements (LAMAs) to avoid the visual prominence of the built form and to maintain landscape values. All buildings will be of up to 8 metres in height using colours and materials restricted to a range of black, browns, greens or greys. These controls, along with the use of natural materials such as locally sourced schist and unstained cedar will avoid any potential further visual prominence. The proposal will build upon the existing character of subdivision in the area, notably the Speargrass Flat residential area to the immediate south-west of the Site and the future development on the opposite side of Hogans Gully Road.

The landscape in which the Site is located retains high landscape and visual values and that it is considered that the proposal will change, but not erode those values.

Rules

A review of the rules proposed to apply to the Rural Lifestyle has been undertaken, including the specific rules that are proposed to apply to the McDonnell Road Rural Lifestyle zone. It is considered that appropriate landscape outcomes can be achieved, and any potential effects can be adequately addressed, by applying these rules to the Site.

In addition, as described earlier in this report, the proposal includes a requirement for LAMA, which will ensure views of the surrounding landscape from public roads are preserved, while partially screening, or visually softening proposed dwellings through appropriate landscape treatment. The LAMA also allows an area of open space/landscaping to ensure that dwellings will not be overly prominent or close to the road, and preserves rural character.

It is considered that taken together, these measures will ensure appropriate landscape outcomes will be achieved, and potential adverse effects are avoided, for the Site and the wider area.

Below is an analysis of the rules that will apply in the new zone, in terms of whether/how appropriate landscape outcomes will be ensured.

Proposed Rule (amendments in bold and underlined)	**Commentary**
22.4.3 Rural Lifestyle Zone **22.4.3.1** The construction and exterior alteration of buildings located within a building platform approved by resource consent, or registered on the applicable computer freehold register. **22.4.3.2** The exterior alteration of buildings located outside of a building platform not exceeding 30% of the ground floor area of the existing building in any ten year period. Non-compliance with rule 22.4.3.2 is a restricted discretionary activity. Discretion is restricted to all of the following: • External appearance. • Visibility from public places. • Landscape character. • Visual amenity. **22.4.3.3** The identification of a building platform for the purposes of a residential unit.	It is considered appropriate that a permitted activity status relates to both the construction and exterior alteration of buildings, approved by a resource consent. It is considered appropriate that discretion is sought for non-compliance of this due to the sensitivity of the area. A discretionary activity status regarding the location of a building platform is also considered appropriate, to avoid potential visual prominence.
22.5.1 Building Materials and Colours All buildings, including any structure larger than 5m², new, relocated, altered, reclad or repainted, are subject to the following in order to ensure they are visually recessive within the surrounding landscape: Exterior colours of buildings: 22.5.1.1 All exterior surfaces **(excluding windows)** shall be coloured in the range of black, browns, greens or greys; 22.5.1.2 Pre-painted steel, and all roofs shall have a reflectance value not greater than 20%; 22.5.1.3 Surface finishes shall have a reflectance value of not greater than 30%. **22.5.1.4 Natural materials such as locally sourced schist and unstained cedar may be used.** Discretion is restricted to all of the following: • Whether the building would be visually prominent, especially in the context of the wider landscape, rural environment and as viewed from neighbouring properties. • Whether the proposed colour is appropriate given the existence of established screening or in the case of alterations, if the proposed colour is already present on a long established building. • The size and height of the building where the subject colours	It is proposed that for all buildings in the Rural Lifestyle Zone, the colours and materials used be restricted to a range of black, browns, greens or greys; pre-painted steel; and that all roofs must have a reflective value not greater than 20% and surface finishes a value not greater than 30%. It is also proposed that the use of natural materials such as locally sourced schist and unstained cedar are used, which will further assist in integrating the built forms into the landscape. For non-compliance of these, a restricted discretionary activity status is deemed appropriate, due to the buildings potentially being visually prominent, even if parts of buildings are visible from various viewpoints

would be applied	
22.5.4 Setback from internal boundaries The minimum setback of any building from internal boundaries shall be: 22.5.4.2 Rural Lifestyle zone - 10m Discretion is restricted to all of the following: • Visual dominance. • The effect on open space, rural character and amenity. • Effects on privacy, views and outlook from neighbouring properties. • Reverse sensitivity effects on adjacent properties. • Landscaping.	To maintain the openness between buildings, a 10 metre setback from internal boundaries will be consistent with other areas around Speargrass Flat Road. As set out in proposed rule 27.8.10.1 a structure plan will be prepared at time of subdivision, showing the location of all building platforms and internal lot boundaries
22.5.5 Setback from roads The minimum setback of any building from a road boundary shall be 10m, except - in the Rural Residential zone at the north of Lake Hayes, the minimum setback from Speargrass Flat Road shall be 15m. - **in the Rural Lifestyle zone on the northern side of McDonnell Road the minimum setback shall be 75m**	The 75m LAMA will ensure that all new buildings will be more than sufficiently set-back from roads . A planting layout plan for the Landscape Amenity Management Area (LAMA) will be prepared, including species and densities of tussocks and naturalised groups of exotic and indigenous trees and shrubs and mowed grass to create a predominately open character. The LAMA will be established and maintained by owners in accordance with a maintenance programme to ensure a survival rate of at least 90% within the first 5 years. This will ensure that positive amenity effects can be achieved through the LAMA.
22.5.8 Building Height The maximum height for any building is 8 metres.	All buildings will not exceed 8m in height, which is consistent with the height of other buildings in the area.
22.5.9 Glare 22.5.9.1 All fixed exterior lighting shall be directed away from adjacent roads and sites. 22.5.9.2 Activities on any site shall not result in more than a 3 lux spill (horizontal and vertical) of light to any other site, measured at any point within the boundary of the other site. 22.5.9.3 There shall be no upward light spill.	It is considered appropriate that activities that breach this standard would be considered as a non-complying activity, due to the potential for light spill to erode the night-time characteristics of the area.
22.5.12 Residential Density: Rural Lifestyle Zone 22.5.12.1 One residential unit located within each building platform. 22.5.12.2 On sites less than 2ha there shall be only one residential unit.	The proposed development will be consistent with this rule. Up to 10 lots each of 2ha, each containing one building platform per lot is consistent with the pattern of

22.5.12.3 On sites equal to or greater than 2 hectares there shall be no more than one residential unit per two hectares on average. For the purpose of calculating any average, any allotment greater than 4 hectares, including the balance, is deemed to be 4 hectares.	development in the Speargrass Flat area.
Chapter 27 Hogans Gully Rural Lifestyle Zoning New Objective Enable subdivision to Rural Lifestyle densities while maintaining the landscape character of the surrounding area. New Policy Subdivision shall be undertaken in accordance with a Structure Plan which provides for appropriate setbacks and landscaping to maintain the landcape character of the surrounding area. New Policy Require the provision of a Landscape Amenity Management Area to preserve views of the surrounding landscape from public roads while visually softening the appearance of buildings in the zone New Policy Avoid linear planting and buildings in the Landscape Amenity Management Area	The objectives and policies specifically proposed for this Rural Lifestyle Zone will ensure that good design outcomes can be achieved in relation to the landscape amenity and planting within the setback areas from the roads and that openness of views can be maintained.

Conclusion

The proposal comprises a 20 hectare area of land for rural lifestyle zoning. Under the Operative QLDC District Plan, the zoning is rural. This proposed re-zoning would enable the creation of up to 10 lots at 2 hectare average density, subject to subdivision consent being obtained. As part of the subdivision consent, a Structure Plan will be required to identify the buildings platforms, internal lot boundaries and access ways, along with a Landscape Management Plan which will address the planting layout. In addition, the proposed rezoning provides for/requires a Landscape Amenity and Management Area (LAMA) of 75m depth along the western and south-western boundaries of the Site, along with a 112m depth setback adjacent to the existing dwelling on the Site's south-eastern corner. This area will be planted to assist in softening the appearance of the proposed buildings and maintain relatively high levels of openness.

The Site is located in a contained area between Arrowtown and Lake Hayes, within a predominantly rural residential environment (Rural Residential Zoning on Speargrass Flat Road and Rural Lifestyle Zoning on the opposite side of Hogans Gully Road). The broader basin landscape is characterised by a mix of land uses, comprising golf courses, the Arrowtown township, rural agricultural land and a mix of rural residential developments.

The Site is relatively visually contained, due to its location at the base of a small escarpment which blocks view to the north and east. The existing vegetation and shelterbelt planting on surrounding

properties assists in curtailing private views from Speargrass Flat. Of the residential properties likely to have views to development on the Site, only the house to the immediate east of the Site will experience moderate visual effects, principally due to its close location to the Site and the lack of existing vegetation screening views. The 112m wide LAMA will assist to keep any new houses away from this property's immediate boundaries, ensuring that the future development is set back beyond the existing dwelling, towards the escarpment.

The 75m and 112m landscape setback will assist in maintaining the openness of the Site when travelling on the Arrowtown-Lake Hayes Road, where clustered tree and shrub planting is anticipated. This, along with a suite of design measures, will assist to absorb the proposal into its landscape setting and maintain the openness of the area.

Rural Residential development is not an uncharacteristic land use activity in the locality as other similar uses have occurred in the area, in particular along Speargrass Flat Road, and the low density of development and landscape setback will assist in maintaining a degree of openness. Whilst there will be a change in the landscape character of the Site if it is rezoned as sought, overall this type of landscape change is not out of character with the surrounding environment.

The anticipated landscape and rural character effects of the proposed rezoning would be of a similar nature to change that has already occurred along Speargrass Flat Road and will inevitably occur on the opposite side Hogans Gully Road under the Rural Lifestyle zoning that applies to that land . This part of the Wakatipu Basin is visually contained by landform and the change would not impact on the landscape values experienced within the wider basin.

Queenstown Lakes District Council

Proposed District Plan – Stage 2
Submission Form

Clause 6 of First Schedule, Resource Management Act 1991
FORM 2

Correspondence to:
Attn: Submission Team
Queenstown Lakes District Council
Private Bag 50072
QUEENSTOWN 9348

For office use only **Submission No:**
Receipt Date:

1. Submitter details:

Full Name of Submitter:	**BOXER HILLS TRUST (BHT)**
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Contact Person:	**A Hutton / J Brown** **R Wolt**

2. Scope of submission

2.1 This is a submission on the Queenstown Lakes District Proposed District Plan ("PDP") Stage 2, notified 23 November 2015

2.2 Summary and purpose of the submission:

BHT generally supports the inclusion of land identified in the plan **attached** as **Annexure A** and located to the east of Arrowtown-Lake Hayes Road at Hogans Gully in the proposed Wakatipu Basin Lifestyle Precinct (**WBLP**) but seeks modifications to some of the provisions of that Precinct, including, but not limited to the following:

- Modify the minimum lot size provisions to enable a subdivision layout that is more practicable and efficient and would provide for better amenity outcomes for the site and for nearby landowners; and
- Change the status of dwellings from Restricted Discretionary activity to Controlled activity, to better provide for certainty for property owners;
- Various other modifications to enable more efficient use of the land.

BHT generally supports the proposed earthworks Chapter 25, insofar as it relates to the WBLP.
BHT generally opposes the proposed changes to Landscapes Chapter 6.

The details of the submission and the reasons for the submission are set out in Parts 3.1 – 3.5 below.

2.3 The specific provisions that BHT's submission relates to are:

(a) Planning maps, including maps 13d, 26 and 27;

(b) Chapter 24 – Wakatipu Basin;

(c) Chapter 25 – Earthworks;

(d) Chapter 27 – Subdivision;

(e) Chapters 3 and 6 (Stage 1) and Chapter 6, Rule 6.4.1.3 (Variation);

(f) Visitor Accommodation Variation, including definitions; and

(g) Any other provisions relevant to this submission.

3. Submission

3.1 Planning maps 13d, 26 and 27

3.1.1 Wakatipu Basin Lifestyle Precinct

BHT **SUPPORTS** the inclusion in the WBLP over the land east of Arrowtown-Lake Hayes Road in the vicinity of Hogans Gully Road, including in particular the land shown in Annexure A..

The reason for the support is that the WBLP is an appropriate zone for the site, taking into account:

(a) the location of the site within an already established rural living area;

(b) the topography of the land, which can easily absorb new rural residential development at a scale and form that would not adversely affect the amenity values of neighbouring properties;

(c) the ability for development within the site to connect to existing infrastructure services.

3.2 Chapter 24: Wakatipu Basin

BHT submits on and generally **SUPPORTS** all the provisions set out in Chapter 24, subject to modifications being made to some of the provisions, as set out in 3.2.1 – 3.2.7 below.

3.2.1 Part 24.1: Zone Purpose

Modify the Zone Purpose as follows:

…

In the Precinct ***~~a limited opportunity for~~*** *subdivision is provided* ***for,*** *with a* ***range of*** ***~~minimum~~*** *lot size****s*** ***to suit the locational attributes of the particular part of the Precinct***. ***~~of 6000 in conjunction with an average lot size of one hectare (10,000m²).~~*** *Controls on the location, nature and visual effects of buildings are used to provide a*

flexible and design led response to the landscape character and visual amenity qualities of the Precinct.

…

The reasons for this modification are:

(a) The words "… *limited opportunity for subdivision* …" should be deleted because the primary purpose of the WBLP is rural residential living, and therefore the opportunity for subdivision for this purpose should be encouraged and enabled;

(b) The minimum lot size of 6000m^2 and average lot size of 1ha will not enable a "*flexible and design led response* …" as is intended by the purpose statement. Rather, the similarity in the minimum and average lots sizes would yield a standard, uniform, "cookie-cutter" subdivision outcome, across the WBLP, with lots generally between 6000m^2 and 1.4ha. This range may not be the best fit for the particular natural features, landscape character or amenity values of a particular area;

(c) Across the WBLP there is a wide variety of locational attributes, topographies, and degrees of potential visibility. The most appropriate intensity in some areas may be a 6000m^2 minimum lot size / 1ha average, but in other areas this may not be the case; a smaller minimum lot size, and perhaps no average, may be more appropriate, to achieve:

- greater flexibility and innovation in subdivision design; and
- design that integrates lots and development with the natural features, landscape character or amenity values of a site and wider surrounds;

(d) Areas within which new development is able to be absorbed into the landscape without adverse effects on the wider landscape values of the Basin – as generally delineated by the WBLP – are, collectively, a finite resource. More efficient use of these areas, for the WBLP's primary purpose of rural residential development, should be enabled; the provisions should generally promote a greater intensity of rural residential lots while maintaining development standards to appropriately manage external effects;

(e) There is no clear section 32 evaluation that justifies the 6000m^2 / 1ha regime across the entire WBLP.

3.2.2 Objective 24.2.5

Modify this objective as follows:

24.2.5 ***Objective – ~~The landscape character and visual amenity values of the Precinct are maintained and enhanced in conjunction with enabling rural residential living opportunities.~~ Enable rural residential living opportunities while managing effects of subdivision and development on the landscape character and visual amenity values of the Precinct.***

The reason for the modification is:

(a) the premise of the notified objective is flawed because the WBLP is intended to provide for rural residential living which will inevitably change the landscape character and visual amenity of a site (and, potentially, the wider surrounding area). The wording of the notified objective could be interpreted to mean that landscape character and visual amenity values should not change. In particular, "maintain" implies "do not change", and "enhance" implies "improve". The premise of the objective should be reversed, in that the purpose of the Precinct

– having found to have moderate-high or high capacity for absorption of development – is rural residential living, enabled in a way that effects on landscape character and visual amenity values are properly managed;

(b) As in (a) above, the purpose of the WBLP is rural living; the Precinct applies in locations (with moderate-high or high capacity for absorption of development) where rural living can, subject to the relevant activity rules and standards, occur without adverse effects on the landscape and visual amenity values. The reversal of the objective as promoted in the submission makes it clear that the objective is to enable rural living while managing its effects. The words "maintain" and "enhance" are deleted for the reasons set out in (a) above;

3.2.3 Policies 24.2.5.1 – 24.2.5.6

Modify the policies as follows:

Policies	***24.2.5.1***	*Provide for rural residential subdivision, use and development* ***~~only where it protects, maintains or enhances~~*** ***while taking into account and avoiding, remedying or mitigating any potential adverse effects on*** *the landscape character and visual amenity values as described within the landscape character unit as defined in Schedule 24.8.*
	24.2.5.2	*Promote design-led and innovative patterns of subdivision and development that* ***~~maintain and enhance~~*** ***take into account*** *the landscape character and visual amenity values* ***~~of the Wakatipu Basin overall~~*** *as defined in Schedule 24.8.*
	24.2.5.3	*Provide for non-residential activities, including restaurants, visitor accommodation, and commercial recreation activities while ensuring these are appropriately located and of a scale and intensity that ensures that the amenity, quality and character of the Precinct is retained.*
	24.2.5.4	*Implement* ***~~minimum and average~~*** *lot size standards in conjunction with* ***~~building coverage and height standards~~*** ***development standards*** *so that the landscape character and visual amenity qualities* ***~~of the Precinct~~*** *as defined in Schedule 24.8 are not compromised by cumulative adverse effects of development.*
	24.2.5.5	*Maintain and enhance a distinct and visible edge between the Precinct and the Zone.*
	24.2.5.6	*Retain vegetation where this contributes to landscape character and visual amenity values of the Precinct and is integral to the maintenance of the established character of the Precinct.*

The reasons for the modifications are:

(a) The modification to Policy 24.2.5.1 is necessary to reflect the changes to the objective, as discussed in 3.2.2 above, and for the same reason as the changes to the objective.

(b) The modifications to Policy 24.2.5.2 are necessary for the reasons set out above in relation to the objective: subdivision and development for rural residential living purposes will inevitably change landscape character and visual amenity values. The words "maintain" and "enhance" imply, respectively, "do not change", and "improve", which may be interpreted to be contrary to the WBLP's primary

purpose of rural residential living. Rather, change should be anticipated and properly managed, and development should be required to take into account the specific values of the landscape character units, as recorded in Schedule 24.8;

(c) The modifications to Policy 24.2.5.4 are necessary, as follows:

(i) Given the wide variety of locational attributes, topographies, and degrees of potential visibility from other areas, the "one size fits all" approach, with a minimum and average area, is not appropriate for the WBLP. Some areas may be able to absorb smaller sites, some not, and in some areas an average may be appropriate. Accordingly, the words "minimum and average" are deleted from the policy;

(ii) "Building coverage" and "height standards" are only two of the relevant standards that play a role in regulating development for the purpose of managing effects on landscape and visual amenity values. Setbacks from roads and other properties are also relevant standards. The policy should take into account all of the relevant standards, and the modification reflects this;

(iii) The words "… of the Precinct …" are deleted because landscape and visual amenity values are not constant across all areas within the Precinct; there is a wide variety of locational attributes, topographies, and degrees of potential visibility. Each area within the Precinct is addressed in the Landscape Character Unit descriptions in Schedule 24.8, and it is appropriate that these descriptions, rather than an assumed generic set of values are the subject of the Policy.

3.2.4 Part 24.4: Rules – Activities – Table 24.2

Modify Table 24.2 by adding a new row as follows:

Table 24.2	Activities in the Wakatipu Basin Lifestyle Precinct	Activity Status
24.4.1	Any activity not listed in Tables 24.1 to 24.3	~~NC~~ **D**
…		
24.4.25	The construction of new residential buildings and the exterior alteration to existing buildings located within an approved building platform area. Control is restricted to: • Building scale and form. • External appearance including materials and colours. • Accessways. • Servicing and site works including earthworks. • Retaining structures. • Infrastructure (e.g. water tanks). • Fencing and gates. • External lighting. • Landform modification, landscaping and planting (existing and proposed). • Natural hazards. Excludes farm buildings as provided for in Rule 24.4.8	C

24.2.26	The construction of new residential buildings located outside an approved building platform area.	NC
[*renumber accordingly*]	…	
24.4.29	Clearance, works within the root protection zone ~~or significant~~ trimming of native and/or exotic vegetation. ~~that is of a height greater than 4 metres.~~ ~~Discretion is restricted to:~~ ~~• The extent of clearance~~ ~~• Trimming and works within the root protection zone~~	~~RD~~ P

The reasons for the modifications are:

In relation to the status of activities not listed in the Tables:

(a) The discretionary status is more appropriate for activities that are unintentionally left out of the table, including, for example, in Rule 24.4.29 – works within root protection zone or trimming of exotic vegetation of a height that is greater than 4m. The status of such works for trees less than 4m would be non-complying, which is not the intention. The alternative is to ensure that the tables list the status of a breach for all relevant activities, such as those where a dimension is included as part of the rule. If that is adequately addressed then the overall non-complying default status for "activities not listed" is appropriate.

A further alternative is that, if the above cannot be accommodated, the rules should be redrafted so that all activities not listed or otherwise provide for in the Tables are permitted activities (in the same manner as the structure of the operative plan)"

In relation to the status of buildings:

(b) The subdivision rules require (or should require) that a residential building platform (**RBP**) is nominated on a scheme plan at the time of subdivision so that the consent authority and other parties can assess the likely effects of a future dwelling on the new lot. The location and effects of a future dwelling, along with other associated works such as access and landscaping, will be sufficiently apparent, at the time of subdivision, to allow certainty of the right for a future dwelling and to preclude any need for subsequent Council discretion to refuse an application for a dwelling[1];

(c) The Restricted Discretionary Activity (**RDA**) status for a dwelling within a RBP creates too much uncertainty for property owners and is unnecessary, particularly so in the WBLP because the purpose of the WBLP is to create lots for rural residential purposes;

(d) The Controlled activity status is more appropriate because it provides certainty for landowners while still allowing the Council to manage the effects of a dwelling within the RBP, and associated works, through imposing conditions in relation to the matters of control, as set out in the rule;

(e) The planning method of creating a RBP at the time of the discretionary activity / restricted discretionary subdivision, with controlled activity status for subsequent buildings within the RBP, is well-established in the District, and there is no

[1] Provided other appropriate development standards are met

evidence or section 32 evaluation suggesting that the method has generated adverse effects and is inappropriate;

(f) The default status of non-complying is appropriate for any proposed building not located within an existing approved/registered building platform area because it sets clear guidance on the expected density of dwellings in the WBLP and enables rigorous assessment of the effects of any building not within the RBP.

In relation to clearance of exotic vegetation of a height greater than 4m

(g) Requiring consent to remove, trim or undertake works in the root protection zone is unwarranted. If protection of trees in the WBLP is required to screen buildings this should be protected by a consent condition on a development or as specific protected items in the District Plan. A blanket rule is inefficient and this approach is not necessary and should be deleted.

3.2.5 Part 24.5: Rules – Standards – Table 24.3

Modify Table 24.3 as follows:

	Table 24.3 – Standards	**Non-compliance Status**
24.5.1	**Building coverage** The maximum building coverage for all buildings shall be: **For lots 4000m²or greater:** 15% of lot area, or ~~500~~ **1000m²** ~~gross floor area~~ whichever is the lesser. **For lots less than 4000m²: 25% of lot area** Discretion is restricted to …	RD
…		
24.5.3	**Building height** The maximum height of any building shall be ~~6~~ **8** m. Discretion is restricted to …	RD
…		
~~24.5.15~~	~~**Residential visitor accommodation**~~ ~~The commercial letting of one residential unit or residential flat per site for up to 3 lets not exceeding a cumulative total of 28 nights per 12 month period~~	~~D~~
~~24.5.16~~	~~**Homestay**~~ ~~a. May occur within either an occupied residential unit or an occupied residential fl at on a site, and shall not occur within both on a site.~~ ~~b. Shall not exceed 5 paying guests per night.~~	~~D~~

The reasons for the modification are:

(a) In relation to Standard 24.5.1:

(i) The reference to "gross floor area" (**GFA**) is redundant as the rule is targeting a limit on building footprint, not GFA;

(ii) The maximum allowed size of a RBP is 1000m^2 so this should be the maximum coverage, including dwelling and accessory buildings, or 15% of lot area, for lots 4000m^2 or larger. The effects of the location of these buildings within the RBP will have been addressed at the time of

subdivision, and there is no further need to address effects of the location of the building;

(iii) For lots smaller than 4000m^2, 15% coverage may be too small to comfortably accommodate a dwelling and accessory buildings, therefore a 25% coverage limit is proposed.

(b) In relation to Rule 24.5.3:

(i) The building height of 6m is too restrictive and may only enable 1 – 1.5 floors in a dwelling;

(ii) A building height of 8m is more appropriate as it enables two levels. The 8m height limit has existed for many decades without significant problems;

(iii) If at the time of subdivision any potential adverse effects arising from the height of a building in a specific location are identified (as addressed in the assessment of the RBP location) then a specific height limit can be imposed by way of consent notice on the title of the lot. This is well-established practice.

(c) In relation to Rule 24.5.15 and 24.5.16:

(i) The rule should be deleted because the rule is a significant market intervention without environmental justification;

(ii) The notified provisions are a significant and unjustified intervention into the residential and visitor accommodation market in the District;

(iii) The information relied upon in the s32 justification for the visitor accommodation variation states that a significant number of listings (such as in Airbnb) comprise properties that are likely to be used "exclusively" for VA purposes[2]. This is not justified. Most owners, and/or their family and friends, would use the properties even if only occasionally for short term stays. Many use their properties frequently as a second home and prefer the convenience of letting their homes for short term VA while they are absent.

(iv) There is no evidence to suggest that the rules will result in home owners leasing their properties to long term tenants.

(v) The proposed rule ignores the fact that many owners prefer short term VA rentals rather than long term open leasing because:

- It allows the owner(s) and/or their families and friends the freedom to stay at their property whenever they wish by temporarily taking the property out of the VA "pool". This freedom is in most cases not available to the owners if the property is leased to long term tenants; and
- The financial rewards are likely to be higher from short term VA leasing; and
- Short term VA leasing is usually accompanied by property up-keep and regular cleaning, which is not always guaranteed if the property is occupied by long term tenants.

[2] See para 6.19 of the s32 dated 2 November 2017

(vi) The ability to enable short term VA leasing assists the District in fulfilling its continued and growing demand for VA accommodation, especially for families and other groups of more than 2 people who may not be able to afford multiple hotel or motel rooms, who do not wish to stay at a backpacker operation, and who would prefer the comforts of a home during their stay.

(vii) There is no evidence that short term VA leasing will cause greater adverse effects on residential amenity than long term rentals. For example, the District has by nature a large "transient" or seasonal sector of the population. Long term tenants will include late shift workers (restaurants, bars, hotel staff) who arrive home very late at night, which can disrupt residential amenity on a more regular basis than short term VA tenants.

(viii) There is little difference between the "permanent" effects of the use of a property by long term tenants than the less frequent, temporary effects of the use by short term VA tenants.

(ix) The natural attributes and economy of the District are such that the District has high numbers of holiday homes, high numbers of short term visitors, and high numbers of transient workers in tourism-related industries. The juxtaposition of all of these has created the circumstances where short term VA leasing of private residences is practicable, viable and necessary. Intervention into this aspect of the economy is perilous, and other methods of increasing housing availability and reducing affordability should be contemplated on a wider basis rather than through the mechanisms proposed in the Variation.

(x) The section 32 evaluation identifies that only 2.2% of the visitor accommodation is provided in rural areas, and therefore the alleged adverse impacts on residential cohesion and character are not relevant in the rural areas;

(xi) For these reasons in the WBLP the standards for Residential Visitor Accommodation and Homestays should not apply and should be deleted.

3.2.6 Rule 24.7: Assessment matters – Restricted Discretionary Activities

Modify the rule as follows:

24.7 Assessment Matters – <u>Controlled and</u> Restricted Discretionary Activities

24.7.1 In considering whether or not to grant consent **<u>and/</u>**or **<u>to</u>** impose conditions on a resource consent, regard shall be had to the assessment matters set out at 24.7.3 to 24.7.13.

24.7.2 All proposals for restricted discretionary activities will also be assessed as to whether they are consistent with the relevant objectives and policies for ~~the Zone or Precinct as well as those in Chapters 3 Strategic Direction; Chapter 4- Urban Development, Chapter 6 Landscapes and~~ Chapter 28- Natural Hazards.

The reason for the modification to 24.7.1 is: the modification is a consequential amendment arising from the submission in 6.2.2 above, in relation to the status of dwellings within a RBP.

The reason for the modification to 24.7.2 is: it is inappropriate to require assessment of an RDA against the higher order objectives and policies of the Plan, as this opens up the discretion to practically any matter, rather than restricting it to the matters for which the rule is designed, and is akin to the assessment required for a non-complying

activity.. The costs to the applicant and the Council of requiring such an assessment would be unreasonably high. The only reasonably exception is the provisions for natural hazards.

3.2.7 Rule 24.7.3 Assessment matters

Modify Rule 24.7.3 as follows:

	Assessment matters
24.7.3	New buildings (and alterations of existing buildings) **<u>within a residential building platform</u>**, residential flat, building coverage and building height infringements: **Landscape and visual amenity** a. Whether the ~~**location,**~~ form, scale, design and finished materials including colours of the building(s) adequately responds to the identified landscape character and visual amenity qualities of the landscape character units set out in Schedule 24.8 and the criteria set out below. b. The extent to which the ~~**location and**~~ design of buildings and ancillary elements and the landscape treatment complement the existing landscape character and visual amenity values, including consideration of: … • Design~~,~~ <u>and</u> size ~~and location~~ of accessory buildings …
…	

The reason for the submission is that the location of buildings will have been addressed at the time of subdivision.

3.2.7 Schedule 24.8 – Landscape Character Unit 8 – Speargrass Flat

BHT generally **SUPPORTS** the LCU8 evaluation in Schedule 24.8 but seeks the following modifications (tracked change):

8 : Speargrass Flat

Landscape Character Unit	**8: Speargrass Flat**
Landform patterns	Relatively open pastoral flat framed by the south-facing slopes of the Wharehuanui Hills to the north, and the steep margins of the Slope Hill 'Foothills' to the south.
Vegetation patterns	Scattered exotic shelterbelts and patches of mixed scrubland in gullies. Isolated bush fragment to eastern end. Exotic pasture grasses dominate.
Hydrology	A series of watercourses and overland flow paths drain southwards across Speargrass Flat from the Wharehuanui Hills to Lake Hayes.
Proximity to ONL/ONF	Unit does not adjoin ONL or ONF; however, has open longer-range views to surrounding ONL mountain context.
Character Unit boundaries	North: ridgeline crest, Millbrook Structure Plan area <u>and Hills golf course</u> East: crest of hill slopes, Lake Hayes Rural Residential landuse pattern/cadastral boundaries, Speargrass Flat Road. South: ridgeline crest, Hawthorn Triangle hedging. West: vegetation patterns/stream.

Landscape Character Unit	8: Speargrass Flat
Land use	Predominantly pastoral land use with ~~sparsely~~ scattered rural residential lots.
Settlement patterns	Dwellings tend to be well separated and framed by plantings, or set into localised landform patterns. Generally dwellings are located on the flat land adjacent the road although a very limited number of consented but unbuilt platforms located on elevated hill slopes to the south (that enjoy northern aspect). ~~Overall very few consented but unbuilt platforms (3).~~ ~~Typical lot sizes: the majority of lots are over 50ha.~~
Proximity to key route	Located away from a key vehicular route. Part of the area is adjacent to Speargrass Flat/Hogans Gully Road and Arrowtown Lake Hayes Road.
Heritage features	Two heritage buildings/features identified in PDP.
Recreation features	Speargrass Flat Road is identified as a Council walkway/cycleway. Forms part of Queenstown Trail 'Countryside Ride'.
Infrastructure features	No reticulated sewer or stormwater. Reticulated water in places.
Visibility/prominence	The relatively open character of the unit makes it highly visible from the public road network and the elevated hills to the north and south, although the escarpment confining the character unit to the north blocks some views from the north.
Views	Key views relate to the open and spacious pastoral outlook from Speargrass Flat Road (including the walkway/cycleway route) across to the escarpment faces and hillslopes flanking the valley, backdropped by mountains.
Enclosure/openness	The landform features to the north and south providing a strong sense of containment to the relatively open valley landscape.
Complexity	The hillslopes and escarpment faces to the north and south display a reasonably high degree of complexity as a consequence of the landform and vegetation patterns. The valley floor itself displays a relatively low level of complexity as a consequence of its open and flat nature.
Coherence	The relatively simple and legible bold valley landform pattern, in combination with the predominantly open pastoral character, contributes an impression of coherence. Gully vegetation patterning serves to reinforce the landscape legibility in places.
Naturalness	The area displays a reasonable degree of naturalness, ~~as a consequence of the relatively limited level of built development evident.~~ however rural land use has led to land cover modifications with low naturalness associated with the vegetation.
Sense of Place	Generally, the area displays a predominantly ~~working~~ rural residential landscape character although this development is ~~with scattered and~~ for the most part, relatively subservient rural landscape ~~residential development evident in places.~~ ~~Whilst Hawthorn Triangle and Lake Hayes Rural Residential LCUs form part of the valley landscape, their quite different character as a consequence of relatively intensive rural residential development sets them apart from the Speargrass Flat LCU, with the latter effectively reading as 'breathing space' between the two. To the eastern end of the unit, there is the perception of the Lakes Hayes Rural Residential area sprawling into Speargrass Flat~~.
Potential landscape issues and constraints associated with additional development	~~Absence of a robust edge to the Lake Hayes Rural Residential LCU makes Speargrass Flat vulnerable to 'development creep'.~~ Open character, in combination with walkway / cycleway, makes it sensitive to landscape change.

Landscape Character Unit	8: Speargrass Flat
Potential landscape opportunities and benefits associated with additional development	~~Larger-scaled lots suggest potential for subdivision.~~ ~~Subdivision around the edges of the Lake Hayes Rural Residential Unit suggest the potential to consolidate the existing rural residential 'node' and integrate a defensible edge~~. Riparian restoration potential. Easy topography.
Environmental characteristics and visual amenity values to be maintained and enhanced	Sense of openness and spaciousness ~~as a 'foil' for the more intensively developed rural residential areas nearby~~. Views from Speargrass Flat Road to the largely undeveloped hillslopes and escarpment faces to the north and south. Integration of buildings with landform and/or planting.
Capability to absorb additional development	**High,** <u>especially</u> around Lake Hayes Rural Residential LCU 12 edges. ~~**Low**: Elsewhere.~~

The modifications are necessary to:

- ensure that the evaluation of the LCU accurately reflects the existing environment, including zonings and consents;
- ensure that surrounding topographical features are accurately taken into account.
- correct errors in the terminology of activities and operations;
- ensure it provides for the landscape character as it is anticipated to and will likely change under the relevant (proposed) zoning. The LCU's purpose should be to set 'bottom lines', rather than provide a snapshot in time (2017) of the landscape of each unit when that snapshot does not account for and may disenable appropriate development that is otherwise anticipated by the unit's zoning. The mark ups are one way in which this might be achieved, but there may be others.

3.3 Variation to Stage 1 Subdivision and Development Chapter 27

3.3.1 Rule 27.5.1

BHT **OPPOSES** the proposed amendments to Rule 27.5.1 and seeks modifications to the rule, as follows:

Zone		Minimum Lot Area
Rural	…	
	Wakatipu Basin Lifestyle Precinct	**…** **<u>In the area east of Arrowtown-Lake Hayes Road north of Hogans Gully Road: minimum 4000m^2 / average 1ha</u>**

The reasons for the opposition and the modification are as follows:

(a) The reasons set out in 3.2.1 above;

(b) The site has varied topography and features which collectively enable an innovative subdivision response that takes into account:

- the topography;
- views;
- neighbouring properties and their various land uses;

Such a subdivision response would potentially:

- include large areas of open space, to contribute to pastoral uses and amenity, with smaller lots around these open space areas; and
- include sufficient open space buffers at the periphery of the site to provide for amenity values for neighbouring landowners and as a buffer to potential future development on neighbouring lots.

(d) The rigidity of the 6000m^2 / 1ha average subdivision configuration, and the non-complying status for breaching these minima, would inhibit such an innovative design approach and would likely lead to an inferior environmental outcome, for the future lot owners and neighbours;

(e) The 6000m^2 / 1ha average rules are contrary to the various provisions seeking flexible and innovative subdivision design, for example:

- Policy 24.2.5.2: "*Promote design-led and innovative patterns of subdivision and development* …";
- Assessment matters for subdivision, such as Rule 27.7.6.2(f): "*Whether clustering of future buildings would offer a better solution for maintaining a sense of openness and spaciousness, or the integration of development with existing landform and vegetation patterns*."

(f) For the BHT land east of Lake Hayes Road and north of Hogans Gully Road, a 4000m^2 min lot size, with a 1ha average, is appropriate as it allows an appropriate size for the topography and enables provision of open space, taking into account also the setback distance from Lake Hayes-Arrowtown Road and Hogan Gully Road.

3.4 Chapter 25 – Earthworks

BHT **SUPPORTS** the proposed provisions of Chapter 25 – Earthworks, insofar as they relate to the WBLP.

3.5 Variation to higher order Chapters of the PDP

The Submitter considers that various modifications are necessary to Chapter 3 (Strategic Direction) and Chapter 6 (Landscapes) of the PDP, so that the WBRAZ and the WBLP are integrated with and have higher order authority from those chapters. This will include new objectives and policies within those chapters.

3.6 Variation to Stage 1 Landscapes – Chapter 6

3.6.1 Part 6.4 – Rules – Rule 6.4.1.3

Modify the rule as follows:

6.4.1.3 *The landscape categories assessment matters do not apply to the following within the Rural Zones:*

a. Ski Area Activities within the Ski Area Sub Zones.

b. The area of the Frankton Arm located to the east of the Outstanding Natural Landscape line as shown on the District Plan maps.

c. ~~The Gibbston Character Zone~~. ***The Gibbston Character Zone***

d. ~~The Rural Lifestyle Zone~~. ***The Rural Lifestyle Zone***

e. ~~The Rural Residential Zone~~. ***The Rural Residential Zone***

f. The Wakatipu Basin Lifestyle Precinct

The reasons for the submission are:

(a) The zones that have been deleted from the exemptions for assessment under the landscape categories in Chapter 6 (Gibbston Character, Rural Lifestyle and Rural Residential) should be reinstated in the list of exemptions because:

- these zones have already been determined to have certain landscape values and ability to absorb certain activities and development densities; and
- the zones have their own sets of objectives, policies, rules and assessment matters, formulated for the specific attributes and circumstances of those zones. The matters of discretion and assessment matters are sufficient to properly guide the determination on specific applications;
- there is no adequate justification for removing these zones from the exemptions.

(b) The WBLP should be added to the list of exemptions for the same reason as in (a) above – the WBLP zones has its own set of objectives, policies, rules and assessment matters, formulated for the specific attributes and circumstances of the zone.

3.7 Part 2 and section 32 of the Act

3.7.1 Section 5

Subject to the modifications sought in this submission, the PDP achieves the sustainable management purpose of the Act by enabling people and communities of the District to provide for their collective well-being and safety in a manner that: sustains the potential of the natural and physical resources of the WBLP for future generations; will continue to safeguard the life-supporting capacity of air, water, soil, and ecosystems; and will avoid or mitigate potential adverse landscape effects.

The purpose of the Act is therefore achieved by the WBLP and the proposed modifications sought in this submission.

3.7.2 Section 7

The modifications sought in this submission are directly relevant to achieving the following matters to which particular regard must be given:

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

(c) the maintenance and enhancement of amenity values;

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

(g) any finite characteristics of natural and physical resources;

3.7.3 Summary – Part 2 of the Act

The WBLP, with the modifications sought in this submission, achieve the purpose and principles of the Act, for the reasons set out above.

3.7.4 Section 32

Under s32 of the Act, subject to the modifications sought in this submission:

(a) The WBLP objectives are the most appropriate way to achieve the purpose of the Act in relation to the BHT land north of Hogans Gully Road; and

(b) The WBLP provisions are the most appropriate, practicable and most effective and efficient way for achieving the relevant objectives; and

(c) The provisions will have benefits, from:

- better enabling certainty for WBLP property owners and thereby reducing potential transaction costs;
- better enabling flexible and innovative subdivision design, and better environmental outcomes; and

(d) There is no risk of acting (by adopting the modifications sought in this submission) because there is no uncertainty or insufficient information about the subject matter of the provisions.

4. BHT seeks the following decision from the Queenstown Lakes District Council:

4.1 The adoption of the WBLP for the land to the east of Arrowtown-Lake Hayes Road, as shown on Planning Maps 13d, 26 and 27 and in the plan attached as **Annexure A**, including the notified provisions for the WBLP, but subject to the amendments sought elsewhere in this submission; or

4.2 The adoption of any other zone for the land that would achieve the intent of this submission, including a zone with the primary purpose of enabling rural residential development (such as the legacy Rural Residential Zone, or similar), should such a zone be found to be preferable to the WBLP; and

4.5 The modifications to the WBLP provisions as set out in this submission, including:

(a) The modification to Part 24.1: Zone Purpose;

(b) The modifications to Objective 24.2.5;

(c) The modifications to Policies 24.2.5.1, 24.2.5.2, 24.2.5.4;

(d) Part 24.4 – Rules: Table 24.2, new Rules 24.4.25, 24.4.26; Table 24.3 Standards: Rules 24.5.1, 24.5.3, 24.5.4; 24.5.15; 24.5.16; Rule 24.7, 24.7.3 and Schedule 24.8; and

4.6 The modifications to Chapter 27 (Subdivision), Rule 25.5.1; and

4.7 The adoption of Chapter 25 – Earthworks in so far as it applies to the WBLP; and

4.8 The modifications to Chapter 6 (Landscapes) Rule 6.4.13; and

4.9 Modifications to Stage 1 Chapters 3 and 6;

Or

4.10 That the Proposed Plan be amended in a similar or such other way, including any such other combination of objectives, policies, rules and standards so as to address the matters raised in and achieve the intent of this submission;

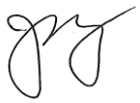
And

4.11 Any consequential amendments or other decisions necessary to address the matters raised in this submission.

BHT **DOES** wish to be heard in support of this submission.

If others make a similar submission, BHT will consider presenting a joint case with them at a hearing.

Signature of Submitter



J A Brown
Authorised to sign on behalf of Boxer Hills Trust

Date: 23 February 2018

Telephone: 03 409 2258

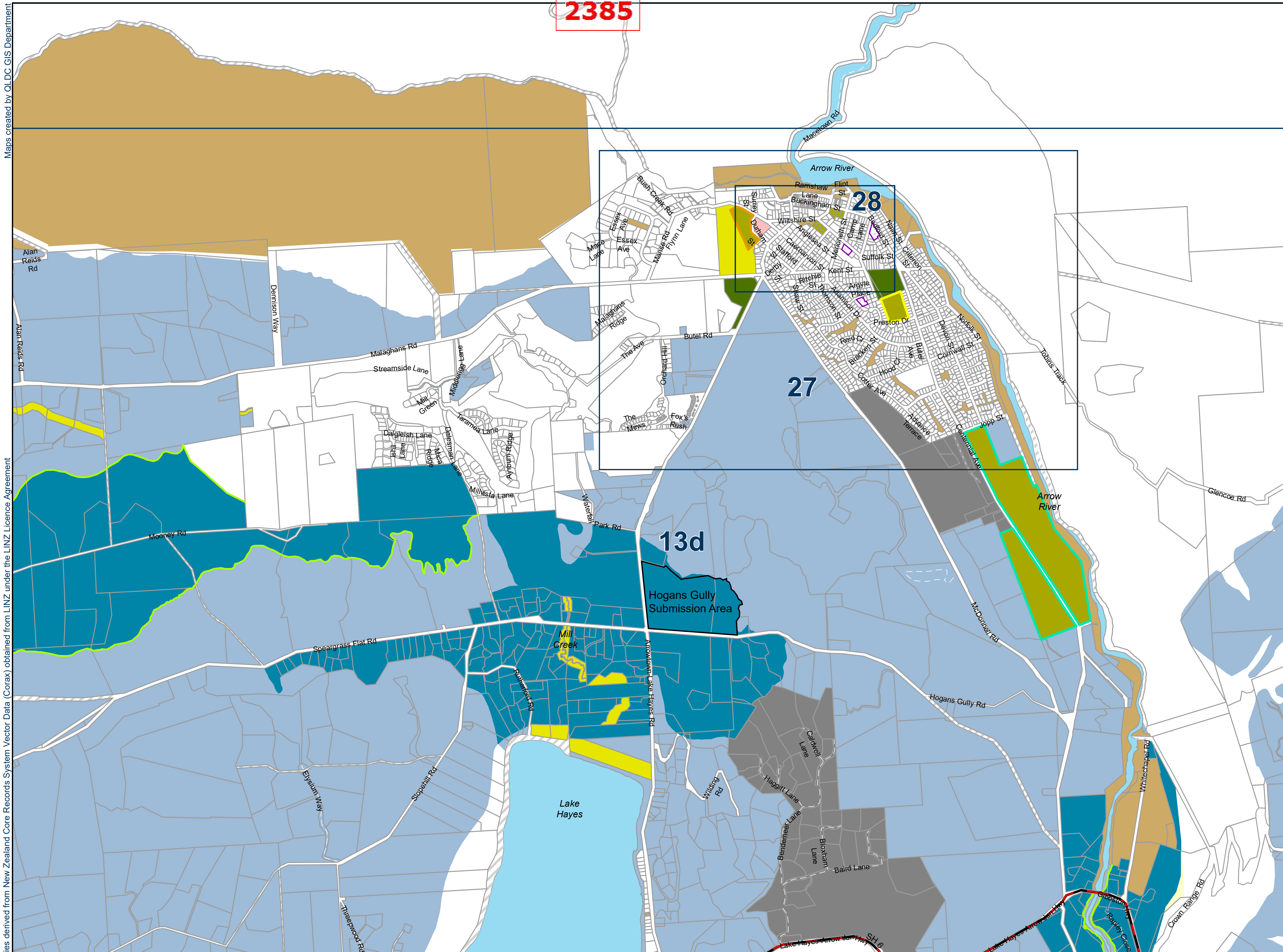
Notes to person making submission:

If you make your submission by electronic means, the email address from which you send the submission will be treated as an address for service.

If you are a person who could gain an advantage in trade competition through the submission, your right to make a submission may be limited by clause 6 (4) of Schedule 1 of the Resource Management Act 1991.

The submitter could NOT gain an advantage in trade competition through this submission

2385



Legend
Parcel/Road Boundary
Landscape Feature
State Highway
Unformed Roads
Visitor Accommodation Sub-Zone
Water (zoned Rural unless otherwise shown)
Zones excluded from Stages 1 and 2 of the District Plan Review
Community Purpose - Campground
Community Purpose - Cemetery
Community Purpose - Golf Course
Active Sports and Recreation
Civic Spaces
Community Purposes
Informal Recreation
Nature Conservation
Wakatipu Basin Rural Amenity Zone
Wakatipu Basin Lifestyle Precinct
Rural
28
27
13d
26
Hogans Gully Submission Area
Arrow River
Lake Hayes
Mill Creek
Speargrass Flat Rd
Hogans Gully Rd
Malaghans Rd
Mooney Rd
McDonnell Rd
Arrowtown Lake Hayes Rd
Centennial Ave
Glencoe Rd
Tobins Track
Macetown Rd
Alan Reids Rd
Dennison Way
Butel Rd
Orchard Hill
Park Rd
Waterfall
Slopehill Rd
Elysium Way
Threepwood Rd
Rutherford Rd
Wilding Rd
Cardwell Lane
Haggitt Lane
Bendemeer Lane
Bloxham Lane
Baird Lane
Whitechapel Rd
Crown Range Rd
SH 6
Lake Hayes-Arrow Junction Hwy

All Stage 1 and Stage 2 land is subject to the District Wide Earthworks Chapter 25, Transport Chapter 29 and Signs Chapter 31.

The District Wide Annotations notified in Stage 1 remain applicable to all Stage 1 and Stage 2 land. Refer to the Proposed District PlanMaps for the location of the District Wide annotations. Specifically the Open Space and Recreation Zoned land that was not notified in Stage 1 is subject to the District Wide annotations and submissions can be made on a District Wide annotation that affects this land.

The Council has identified where the proposed Visitor Accommodation Sub Zones are to be located. Any person may make a submission on the location and extent of Visitor Accommodation Sub Zones as it relates to Stage 1 and Stage 2 land.

Maps created by QLDC GIS Department

Parcel boundaries derived from New Zealand Core Records System Vector Data (Corax) obtained from LINZ under the LINZ Licence Agreement

QUEENSTOWN LAKES DISTRICT COUNCIL

PDP Stage 2 Notification Map 26 - Speargrass Flat, Millbrook

0 0.5 1 Km

Date Published: 01-Nov-17

Queenstown Lakes District Council

Form 6

Proposed District Plan – Further Submission

In support, or in opposition to, a submission of the Proposed District Plan.

Clause 8 of First Schedule, Resource Management Act 1991

To: Queenstown Lakes District Council
Private Bag 50072
Queenstown

1. Name of Further Submitter:

Trojan Helmet Limited:

Address for Service:	C/- Brown & Company Planning Group, PO Box 1467, QUEENSTOWN
Email:	office@brownandcompany.co.nz
Contact Person:	A Hutton / Jeff Brown
Phone:	03 4092258

2. This is a further submission in support of or opposition to various original submissions on the Proposed Queenstown Lakes District Plan (Proposed Plan)

3. Status of Further Submitter:

Trojan Helmet Limited has an interest in the Proposed Plan and the submissions to which this further submission relates that is greater than the interest the general public has, for the following reasons:

- Trojan Helmet Limited owns land in the Queenstown Lakes District that is directly affected by the Proposed Plan and the submissions; and
- Trojan Helmet Limited has made original submissions on the Proposed Plan (Submissions 437, 443 and 452) that address the same subject matter as is addressed in the submissions to which this further submission relates; and/or
- The decisions sought in the original submissions to which this further submission relates will directly affect Trojan Helmet Limited's ability to undertake activities on and develop its land.

4. Trojan Helmet Limited makes the further submissions set out in the following table:

Original Submitter	Submission Number	Plan Provision	Support/Oppose	Reasons for Submission	Decision Sought by Trojan Helmet Limited
Elizabeth Hanan	10	Chapters 3, 6, 14, 21 and 27	Oppose	Trojan Helmet Limited has made original submissions on the Proposed Plan seeking a bespoke Resort Zoning for its land which currently contains The Hills golf course. This Resort Zone will cater for additional residential development and which provide for golf and golf related activities, within appropriate parameters and that contribute to tourism and community wellbeing. The development sought to be enabled by the Resort Zoning is not urban in nature, but will enable residential development to an average density of approximately 1.9ha. The development proposed to be enabled has been carefully and thoroughly considered and assessed, including in terms of its potential effects on the existing rural landscape and amenity.	That the submission is rejected.

Original Submitter	Submission Number	Plan Provision	Support/Oppose	Reasons for Submission	Decision Sought by Trojan Helmet Limited
				Trojan Helmet Limited has also made original submissions seeking the rezoning of land on McDonnell Road and Hogan's Gully Road to Rural Lifestyle Zone. These proposed rezoning's have also been subject to a rigorous and considered analysis as to potential effects on the rural landscape character and amenity. The submission is opposed in its entirety, particularly to the extent that it is inconsistent with Trojan Helmet's original submissions, including to the extent it seeks new residential development to be contained within the UGBs, that the existing zoning of all rural is retained with no further subdivision, and that the Hills Golf Course be retained as a buffer.	
John Murray Hanan	18	Not stated	Oppose	The submission is opposed to the extent it seeks there be no substantial growth changes to the existing growth boundaries	That the submission be rejected.

Original Submitter	Submission Number	Plan Provision	Support/Oppose	Reasons for Submission	Decision Sought by Trojan Helmet Limited
				and that current rural zones outside of the urban area be retained. Trojan Helmet Limited has made original submissions on the Proposed Plan seeking a bespoke Resort Zoning for its land which currently contains The Hills golf course. The Resort Zone will cater for additional residential development and provide for golf and golf related activities, within appropriate parameters, and which contribute to tourism and community wellbeing. The development sought to be enabled by the Resort Zoning is not urban in nature, but will enable residential development to an average density of approximately 1.9ha. The development proposed to be enabled has been carefully and thoroughly considered and assessed, including in terms of its potential effects on the existing rural landscape character and amenity.	

Original Submitter	Submission Number	Plan Provision	Support/Oppose	Reasons for Submission	Decision Sought by Trojan Helmet Limited
				Trojan Helmet Limited has also made original submissions seeking the rezoning of land on McDonnell Road and Hogan's Gully Road to Rural Lifestyle Zone. These proposed rezonings have also been subject to a rigorous and considered analysis as to potential effects on the rural landscape character and amenity.	
NZIA and Architecture and Women Southern (NZIA)	238	Chapter 3, Strategic Direction	Oppose	The use of land for tourism is important and while diversification is supported, so too is the recognition of the importance of the land resource to provide for tourism activities.	That the submission is rejected to the extent it is inconsistent with Trojan Helmet Limited's original submissions.
NZIA and Architecture and Women Southern (NZIA)	238	Chapter 21, Rural Zone	Oppose	The submission is opposed to the extent it opposes the creation of new Rural Lifestyle Zones. New zonings and/or rural residential and lifestyle development should be assessed on a case by case basis and include an assessment of the ability, or	That the submission be rejected.

Original Submitter	Submission Number	Plan Provision	Support/Oppose	Reasons for Submission	Decision Sought by Trojan Helmet Limited
				otherwise, of the land to be farmed as an economic unit.	
NZIA	238	Chapter 22, Rural Residential and Rural Lifestyle	Oppose	It is not appropriate that all new development be located in urban areas. In some cases visitors may want to appreciate what the rural land can offer in terms of other uses, such as golf for example. It is appropriate that these other activities, which require a rural environment, but do not use the land in a traditional "productive" sense, be provided for. It is also appropriate that areas for lower density living be provided for in rural areas, as not all landowners seek or need to live in urban areas.	That the submission be rejected.
NZIA	238	Chapter 27, Subdivision and Development	Oppose	Distinctive edges between urban and rural areas may be appropriate in some, but not all cases. For instance, Arrowtown has an UGB but Millbrook is outside of that and still contributes to Arrowtown and does not detract from the rural environment. The proposed Hills Resort Zone and the proposed Rural Lifestyle	That the submission be rejected.

Original Submitter	Submission Number	Plan Provision	Support/Oppose	Reasons for Submission	Decision Sought by Trojan Helmet Limited
				zoning of Trojan Helmet Limited's McDonnell Road and Hogan's Gully Road land are comparable examples.	
NZIA	238	Chapter 14, Arrowtown Town Centre	Oppose	Trojan Helmet Limited has made an original submission seeking a bespoke Resort Zoning for the Hills Golf Course, and Rural Lifestyle Zoning for land it owns on McDonnell Road and Hogan's Gully Road. The proposed rezonings have been rigorously considered and thoroughly assessed in the expert's reports lodged with and forming part of the submissions. The nature and scale of the development sought to be enabled by the rezonings is not urban in nature and will not erode the character of Arrowtown or undermine the urban boundary.	That the submission is rejected, to the extent it is inconsistent with Trojan Helmet Limited's original submissions.
NZIA		Chapter 30, Energy and Utilities	Oppose	The decision is opposed to the extent it seeks a new policy that restricts urban development outside UGBs. Trojan Helmet Limited has made original submissions	That the submission is rejected, to the extent it is inconsistent with Trojan Helmet Limited's original submissions.

Original Submitter	Submission Number	Plan Provision	Support/Oppose	Reasons for Submission	Decision Sought by Trojan Helmet Limited
				seeking a bespoke Resort Zoning for the Hills Golf Course, and Rural Lifestyle Zoning for land it owns on McDonnell Road and Hogan's Gully Road. The proposed rezonings have been rigorously considered and thoroughly assessed in the reports lodged with and forming part of the original submissions. The nature and scale of the development sought to be enabled by the rezonings is not urban in nature and will not erode the character of Arrowtown or undermine the urban boundary.	
Upper Clutha Environmental Society	145	Chapters 1 (clause 1.7.6 in particular)	Oppose	In respect of Chapter 1, clause 1.7.6, buildings are anticipated in the Rural Residential Zone and Rural Lifestyle zones on lots. Building poles are not necessary unless an applicant wishes to breech the rules of the zone in terms of bulk of a building.	That the submission be rejected.
Sue Bradley	146	Chapter 22, Rule 22.5.1.1	Support	Support the submission in relation to Rule 22.5.1.1 that the colours are too restrictive,	That the submission point be accepted.

Original Submitter	Submission Number	Plan Provision	Support/Oppose	Reasons for Submission	Decision Sought by Trojan Helmet Limited
				for the reasons stated in the submission.	
Aurum Survey Consultants	166	Chapter 27, Rule 27.4.1	Support	Trojan Helmet Limited agrees that, under Rule 27.4.1 subdivision should be a controlled activity where the subdivision is in keeping with the objectives of the zone, for the reasons stated in the submission.	That the submission point be accepted.
Aurum Survey Consultants	166	Chapter 27, Rule 27.4.3(a)	Support	Trojan Helmet Limited agrees that under Rule 27.4.3(a), subdivision should be a controlled activity where the subdivision is undertaken in accordance with a structure plan or spatial layout plan, for the reasons stated in the submission.	That the submission point be accepted.
Aurum Survey Consultants	166	Chapter 22, Rule 22.5.12.3	Support	Reject the 4ha cap to calculate the average, for the reasons stated in this submission.	That the submission point be accepted.
Jane and Mark Taylor	444	Chapter 22, Rule 22.5, Table 2	Support	The submission in relation to Rule 22.5, Table 2, which seeks the standard for building size is deleted and the former controlled activity status is retained, which is supported, for the reasons stated in the submission.	That the submission point be accepted.

Original Submitter	Submission Number	Plan Provision	Support/Oppose	Reasons for Submission	Decision Sought by Trojan Helmet Limited
Wayne Evans, G W Stalker Family Trust, Mike Henry	534	Chapter 22, Rule 22.5	Support in part	The submission in relation to Rule 22.5, which seeks clarification and amendment to the Building Materials and Colours rule, including that the former 36% reflectivity LRV is reinstated, which is supported for the reasons stated in the submission	The submission point be accepted to the extent it is not inconsistent with the Trojan Helmet Limited's original submission.
Wayne Evans, G W Stalker Family Trust, Mike Henry	534	Chapter 22, Rule 22.5.3	Support	The submission that Rule 22.5.3 be deleted is supported, for the reasons stated in the submission. There is no need for a maximum building footprint rule when there is already a building coverage rule.	That the submission point be accepted.
Wayne Evans, G W Stalker Family Trust, Mike Henry	534	Chapter 27, New Rule 27.5.5	Support	The submission seeking a new rule be included in the Proposed Plan that provides for boundary adjustments as a controlled activity is supported for the reasons stated in the submission	That the submission point be accepted.
Jane Shearer	29	Chapter 22, Rule 22.5, Table 2	Support in part	The submission seeking amendments to policy and/or other provisions which explain differences in glossy and matte surfaces in reflecting light and consider more analysis is made of the rules.	That the submission point be accepted.

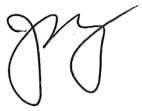
Original Submitter	Submission Number	Plan Provision	Support/Oppose	Reasons for Submission	Decision Sought by Trojan Helmet Limited
Anna-Marie Chin Architects and Phil Vautier	368	Chapter 22, Rule 22.5.3	Support	The submission seeking Rule 22.5.3 be deleted is supported for the reasons stated in the submission and in Trojan Helmet Limited's original submission. The deletion of the rule is appropriate as the platform size has already the defined the area to build on.	That the submission point be accepted.
Anna-Marie Chin Architects and Phil Vautier	368	Chapter 22, Rule 22.5, Table 2	Support	The submission seeking that reflective values of building surfaces for walls and roofs be increased back to 36% is supported for the reasons stated in the submission.	That the submission point be accepted.

5. Trojan Helmet Limited **DOES** wish to be heard in support of this further submission; and

6. If others make a similar submission, Trojan Helmet Limited **WILL** consider presenting a joint case with them at the hearing.

TROJAN HELMET LIMITED

A A Hutton / J A Brown



Authorised to sign on behalf of Trojan Helmet Limited

Dated: 18 December 2015

2795

Queenstown Lakes District Council – Proposed District Plan Stage 2

Further Submission

In support, or in opposition to, submissions to the Proposed District Plan under Clause 8 of First Schedule, Resource Management Act 1991

To: Queenstown Lakes District Council
Private Bag 50072
Queenstown

Attention: Planning Policy

1. Submitter details:

Name of Further Submitter:	**Boxer Hill Trust (BHT)**
Address for Service:	C/- Brown & Company Planning Group, PO Box 1467, QUEENSTOWN
and	C/- Lane Neave, PO Box 701, QUEENSTOWN
Email:	office@brownandcompany.co.nz rebecca.wolt@laneneave.co.nz
Contact Person:	**A Hutton / J Brown** **R Wolt**

2. Further Submitter's status

BHT has an interest in the Proposed District Plan (**PDP**) ï Stage 2 that is greater than the interest of the general public, because BHT owns land that is included within, and affected by, the Wakatipu Basin Rural Amenity Zone (**WBRAZ**) and the Wakatipu Basin Lifestyle Precinct (**WBLP**) proposed by Stage 2 of the PDP and because BHT also made original submissions on Stage 2 of the PDP (Submission 2385 and 2386).

3. The Further Submitter makes the further submissions set out in the following table:

Original Submitter	Original Submission Number	Further Submission Support or Oppose?	Reasons for the Further Submission	The Further Submitters seek the following:
Roger Monk	**2281** **2281.1 – 2281.10**	**SUPPORT in so far as it relates to LCU24, except in relation to the relief sought in respect of Rule 24.5.2.**	The submitter seeks a number of changes to the provisions that apply to LCU 24 which are generally supported. Chapter 24 does not take into account the existing land use patterns in the Wakatipu Basin including LCU24 in particular.	That the submission is accepted insofar as it relates to LCU24, except in relation to the relief sought in respect of Rule 24.5.2.
Arrowtown Retirement Village Joint Venture	**2505** **2505.1 – 2505.56, including Appendix 1 and 2.**	**SUPPORT**	The submitter seeks that the land that is subject to SH16014, which provided consent for the Arrowtown Lifestyle Retirement Village, be rezoned so that the zone reflects the consented activities and achieves an efficient and integrated planning outcome. In the alternative, the submitter seeks a WBLP zoning, subject to amendments to the WBLP provisions. BHT agrees that the notified WBRAZ of the submitterôs land is illogical and does not reflect the historical and existing character of the area, LCU24, or the site. Nor does it reflect the findings and recommendations in the Wakatipu Basin Land Use Study (**WBLUS**). BHT agrees that the notified WBRAZ of the site, and LCU 24 in general, is not supported by an adequate section 32 analysis. BHT agrees with the changes sought to Chapter 24 and considers they better reflect	That the relief sought in the submission is accepted in so far as it is no less enabling in respect of the WBLP provisions than BHTôs original submissions 2385 and 2386.

Original Submitter	Original Submission Number	Further Submission Support or Oppose?	Reasons for the Further Submission	The Further Submitters seek the following:
			the character of the Wakatipu Basin and make appropriate provision for further development.	
J & R Hadley	**2559**	**OPPOSE in so far as it relates to the land addressed by BHT's original submission 2385.**	BHT considers there are opportunities for development within LCU8 that is sensitively designed, including the development proposed in BHT's original submission 2385. BHT considers that WBRAZ is not an appropriate zoning for the land the subject of submission 2385 taking into account the consented development in and around Hogans Gully Road the Arrowtown Lakes Hayes Road.	That the submission is rejected insofar as it relates to the land addressed by BHT's original submission 2385.
Andrew Green	**2106.1**	**SUPPORT**	BHT agrees that the notified WBRAZ zoning of LCU 24 does not take account of the existing and consented land use patterns of the LCU and is inappropriate. BHT agrees that a WBLP zoning is more appropriate for LCU24 for the reasons stated in the submission.	That the submission is accepted, subject to appropriate controls on buildings and landscaping as generally proposed in BHT's original submissions 2385 and 2386 under new rule 24.4.25.
Banco Trustees Limited, McCulloch Trustees 2004 Limited and Others	**2400.3**	**SUPPORT**	The notified WBRAZ zoning of LCU24, which incudes the submitter's land, does not take account of the existing and consented land use patterns of the LCU and is inappropriate. The WBLUS identifies LCU24, which incudes the submitter's land, as suitable for residential development and BHT considers that given the land's proximity to Arrowtown it lends itself to such development. BHT supports the submission subject to appropriate controls or standards on building height, colours, materials,	That the submission is accepted, subject to appropriate controls or standards in respect of buildings (setbacks, heights, external appearance etc.) and landscaping, which may include the controls proposed in BHT's original submissions 2385 and 2386, under new rule 24.4.25.

Original Submitter	Original Submission Number	Further Submission Support or Oppose?	Reasons for the Further Submission	The Further Submitters seek the following:
			setbacks and landscaping etc so as to ensure appropriate amenity outcomes are achieved within the WBLP and so that there is consistency and cohesion throughout the WBLP.	
Peter John Dennison and Stephen John Grant	**2301** **2301.1 – 2301.18**	**SUPPORT**	The submitters make a number of submission points relating to the form and function of the WBRAZ and the WBLP which are generally considered appropriate and are supported by BHT.	That the submission be accepted insofar as it seeks amendments to Chapter 24 that accord with the intent of and are no less enabling than BHTõs original submissions 2385 and 2386.
Crown Investment Trust	**2307**	**SUPPORT**	The submitter seeks a number of changes to the PDP, including the Strategic Directions Chapters and the WBRAZ and WBLP provisions which are generally supported because they will ensure the better integration of Chapter 24 with the Strategic Directions Chapters, and provide an appropriate basis for managing subdivision, use and development of the land within the WBRAZ and WBLP.	That the relief sought in the submission be accepted insofar as it accords with the intent of and is no less enabling than the relief sought in BHTõs original submissions 2385 and 2386.

4. The Submitter DOES wish to be heard in support of this further submission.

5. If others make a similar submission, the Submitter WILL consider presenting a joint case with them at the hearing.

Signed: A Hutton / J Brown

Dated: 27 April 2018