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MOLYNEUX LIFESTYLE VILLAGE LIMITED

REQUEST FOR A CHANGE TO THE OPERATIVE CENTRAL OTAGO DISTRICT PLAN

Job No: A4814
Date: April 2021
Status: Final

Prepared For:
Molyneux Lifestyle Village Ltd

Prepared By:
Peter Dymock
RPSurv/BSc/DipMgt/MNZIS
Senior Planner

Paterson Pitts Limited Partnership (Alexandra Office)

P O Box 103
Alexandra 9340
Telephone: +64 3 448 8775
Email: peter.dymockl@ppgroup.co.nz
Web: www.ppgroup.co.nz

Table of Contents

1.0 Introduction

1.1 The Requestor

The requestors is:

Molyneux Lifestyle Village Ltd
c/- Russell Ibbotson
P O Box 120
Alexandra 9340
Email: rwibbotson@gmail.com

The address for service is:

c/- Paterson Pitts Limited Partnership
P O Box 103
ALEXANDRA 9340

Attn: Peter Dymock
Email: peter.dymock@ppgroup.co.nz
Phone: (03) 448 8775 (0274) 377 910

1.2 Overview

Molyneux Lifestyle Village Ltd (MLVL) requests a change to the Operative Central Otago District Plan ("the District Plan") to re-zone approximately 16ha of land from Rural Residential Resource Area (Ru[RR]) to a proposed Residential Resource Area (14) [(RRA(14)] that will provide for a minimum lot size of 2000m^2.

The amendments proposed to the Plan are the addition of [RRA(14)] zoning on planning Map 12, an addition to policy 7.2.7, an addition to Rule 7.3.3 (i) (c) to provide for a new sub-zone to the Residential Resource Area and minor amendments to the rules to preclude direct access from lots within the site to Dunstan and Waldron Roads and to provide for a minimum side yard of 3m on all side yards

No changes are proposed to the issues, objectives, methods of implementation, principle reasons for adopting objectives, policies and methods and environmental results anticipated in Sections 6 & 7 of the Plan.

The re-zoning of the site will enable "large lot" residential use of the site similar to that in various existing residential sub zones in the vicinity of Cromwell and the RRA (9) Residential Resource Area at the top of Bridge Hill in Alexandra.

2.0 The Site

A plan of the land subject to the request is shown at **Appendix 'A'.**

The land is contained within the following records of title:

- Part Lot 13 DP 3194 (4.0469ha) RT OT5B/1137
- Part Lot 13 DP 3194 (4.2543ha) RT OT5B/1138

- Part Lot 12 DP 3194 (4.1708ha) RT OT5B/1024
- Part Lot 12 DP 3194 (4.0620ha) RT OT5B/1025

All owned by Molyneux Lifestyle Village Ltd.

A copy of the above titles are at **Appendix 'B'**. The total land area subject to the request is 16.5340ha.

3.0 The Existing Environment

The site is located at 269 Dunstan Road and 38 Waldron Road, some 950m from the current Alexandra town limits (i.e. the new Council subdivision off Henderson Drive). The site is essentially flat within a location that exhibits a mixture of lot sizes and uses that reflects the location's Rural – Residential zoning i.e. predominately that of small "lifestyle blocks" averaging 2ha, with existing dwellings.

The site no longer has access to an irrigation supply suitable for productive use and there is no productive use made of the site, the former vineyard occupying the site having been removed.

There are two dwellings within the site and a winery building that continues to operate, processing grapes from off-site.

The Central Otago Rail Trail is directly across the opposite side of Dunstan Road from the site, as is the Alexandra Golf Course.

4.0 Purpose & Reason for the Request (the Objectives of the Request)

The objectives of the Request are to provide an opportunity for "large lot" residential living in close proximity to the Alexandra Township.

A previous non-complying resource consent application (RC 170337) was made by the Requestor to subdivide the site into 20 lots. This application was declined, however the Sec 42A planner's report RC 170337 opined that:

"Logical Expansion of Residential Resource Area
The application has been advanced on the basis that it will assist in alleviating the immediate shortage of sections in Alexandra, at a location very close to the town, while still maintaining the rural-residential nature of the neighbourhood. If land in addition to that included in the Residential Resource Area is required to satisfy a shortage of sections in Alexandra we consider that the appropriate mechanism for doing so (outside the District Plan Review) is via a plan change in the first instance. During the period since the District Plan became operative on 1April 2008 there have been several plan changes which have rezoned land for urban purposes.

A logical expansion of the Residential Resource Area at Alexandra could involve the rezoning of land in the Rural Resource Area that is subject to the Rural Residential notation opposite the existing Residential Resource Area (which includes the freehold land including land proposed to be subdivided as discussed under "Positive Effects" above). Over time it may well be that such zoning is advanced progressively along the east side of Dunstan Road towards Hillview Road, in the first instance, and then beyond towards the subject site.

In our view such an approach to accommodating the need for additional residential development in Alexandra (along with the opening up of land in the current Residential Resource Area) is preferable to consenting applications for non-complying activity subdivisions, such as the current proposal, which raise significant issues with respect to precedent and plan integrity."
(my underlining)

The Vincent Spatial Plan has now identified Dunstan Road as the site for further "large lot" development. This Request therefore gives effect to the Sec 42A report recommendations and the Vincent Spatial Plan.

5.0 The Proposed Changes to the Operative District Plan

The proposed changes to the District Plan are as follows:

(i) Amend Planning Map 42 to insert a new Residential Resource Area (14) boundary as shown in **Appendix 'C'**.

(ii) Amend policy 7.2.7 as follows:

7.2.7 **Policy - Residential Resource Areas (1) – ~~(13)~~ (14)**

To ensure that subdivision and development in the areas shown as Residential Resource Areas (1) – ~~(13)~~ (14) complement the character and amenity of these areas and provide for the protection of significant landscape features, where such features are present.

Cross Reference

Objective: 7.1.1, 7.1.2

Rule: 7.3.2(ii),(iii) (iv), 7.3.3

The area identified as Residential Resource Area (13) is located on Dunstan Road in close proximity to Alexandra. The area concerned is considered suitable for large lot residential subdivision.

(iii) Amend Rule 7.3.3 Discretionary Restricted Activity

(i) Subdivision

PROVIDED THAT

(c) Notwithstanding (a) and (b) above, the following minimum size for allotments and other standards shall apply in the areas set out below:

Residential Reserve Area (14)

Minimum Allotment Area – 2,000m² Cross Reference Policy 7.2.7 Map 42

(iv) Amended Rule 7.3.6 (iii) Bulk and Location of Buildings (c) Side & Rear Yards as follows:

(ii) Minimum side yards of 3 metres are required on all side yards in Residential Resource Areas (1) to (7), (9) and (14).

(v) Amend Rule 7.3.6 (vi) Access as follows:

(h) No residential lots in the Residential Resource Area (14) shall have direct access to Dunstan Road or Waldron Road.

The request includes any necessary consequential changes to the plan required by the Council to accommodate the above proposed changes to the Plan.

6.0 Statutory Matters

6.1 Part 2 RMA91

5. Purpose

(1) The purpose of this Act is to promote the sustainable management of natural and physical resources.

(2) In this Act, sustainable management means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety while –

a. Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and

b. Safeguarding the life-supporting capacity of air, water, soil, and ecosystems, and

c. Avoiding, remedying, or mitigating any adverse effects of activities on the environment.

The request enables the well-being of the Alexandra community and surrounding area by expanding the urban area to accommodate the growing population in the most logical location for expansion and with a zoning that provides for larger lot sizes, differing housing typologies and affordability levels. The life supporting capacity of air, water and soil will be maintained by the reticulation and disposal of wastewater into an established reticulation and treatment scheme.

The request includes provisions to avoid, remedy and mitigate adverse effects on the environment as to increased traffic generation and provision of suitable infrastructure.

6. Matters of National Importance

In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall recognise and provide for the following matters of national importance:

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

(b) The protection of outstanding natural features and landscapes from inappropriate subdivision, use and development.
(c) The protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna.
(d) The maintenance and enhancement of public access to and along the coastal marine area, lakes, and rivers.
(e) The relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga.
(f) The protection of historic heritage from inappropriate subdivision, use, and development.
(g) The protection of protected customary rights.
(h) The management of significant risks from natural hazards.

Paragraphs (a) and (d) are not relevant to this Request.
(b) The site does not contain any outstanding natural features or landscapes.
(c) The site does not contain any areas of significant indigenous vegetation and significant habitats of indigenous fauna.
(e) & (g) So far as is known, the site does not contain any sites of particular importance to Maori. The best way to deal with this issue is by way of discovery protocols as a condition of consent on any subsequent resource consents to subdivide or develop the site.
(f) The site does not contain any items of historic heritage.
(h) The site is not subject to any significant risk from natural hazards.

7. Other Matters

In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development and protection of natural and physical resources, shall have particular regard to –

(a) Kaitiakitanga
[(aa) The ethic of stewardship]
(b) The efficient use and development of natural and physical resources
[(ba) The efficiency of the end use of energy]
(c) The maintenance and enhancement of amenity values
(d) Intrinsic values of ecosystems
(e) Repealed
(f) Maintenance and enhancement of the quality of the environment
(g) Any finite characteristics of natural and physical resources
(h) The protection of the habitat of trout and salmon
[(i) The effects of climate change]
[(j) The benefits to be derived from the use and development of renewable energy]

Paragraphs (a), (aa), (ba), (d), (g), (h), (i), and (j) are not relevant to this Request.

(b) It is efficient to expand Alexandra in a location that is well suited for larger lot residential development and that is close to and well linked to the existing township and the amenity that it provides.

(c) & (f) The prosed zoning is in accordance with the Vincent Spatial Plan and the objectives, policies and rules of the District Plan for the proposed resource area provide for the maintenance and enhancement of amenity values in residential subdivision and development.

No matters arise regarding Sec 8 (Treaty of Waitangi) of Part 2.

6.2 Section 73 and Schedule 1 RMA91

Under Section 73(2) of the Act any person may request a territorial authority to change a district plan, and the plan may be changed in the manner set out in Schedule 1. Clause 22 of Schedule 1 (Form of request) requires that the request:

- *Shall be made in writing and shall explain the purpose of, and reasons for, the change to the plan and contain an evaluation report prepared in accordance with Section 32 for the proposed plan or change; and*

A Section 32 evaluation is appended at **Attachment 'E'**.

- *Where environmental effects are anticipated, shall describe those effects, taking into account clauses 6 and 7 of Schedule 4, in such detail as corresponds with the scale and significance of the actual or potential environmental effects anticipated from the implementation of the change.*

An Assessment of Environmental Effects is appended at **Attachment 'D'**.

Under Clause 25 of Schedule (1) the Council may reject the request in whole or in part but only on certain grounds:

(a) The request or part of the request is frivolous or vexatious; or
(b) Within the last 2 years, the substance of the request or part of the request –
(i) Has been considered and given effect to, or rejected by, the local authority or the Environment Court; or
(ii) Has been given effect to by regulations made under Section 360A; or
(c) The request or part of the request is not in accordance with sound resource management practice; or
(d) The request or part of the request would make the policy statement or plan inconsistent with Part 5; or
(e) In the case of a proposed change to a policy statement or plan, the policy statement or plan has been operative for less than 2 years.

- The request is not frivolous or vexatious.
- Within the last 2 years, the substance of the request has not been considered by the Council or the Environment Court.
- The request accords with sound resource management practice.
- The request would not make the Operative Plan inconsistent with Part 5 of the Act.
- The District Plan has been operative for more than 2 years.

Preliminary discussions were held with Council's Planning Department in this matter and it was confirmed that Council had never refused to accept a request for a

private plan change for further processing on any of the grounds outlined in Section 25(4) of Part 2 Schedule 1 of the RMA 91.

6.3 Section 74 RMA91

Section 74 (2) (a) requires consideration of any Proposed Regional Policy Statement (PRPS) or Proposed Regional Plan (PRP). The PRPS is considered in the Sec 32 evaluation at **Appendix 'E'**

In summary, the Request is consistent with and gives effect to the PRPS. There are no relevant PRPs.

With regard to Section 74 (2) (b):

- The Otago Southland Regional Land Transport Plan prepared under the Land Transport Management Act 2003 is considered in the Sec 32 evaluation at **Appendix 'E'.**
- There are no relevant entries on the NZ Heritage List/Rarangi Korero.

With regard to Section 74(2A). The Kai Tahu ki Otago Natural Resource Management Plan 2005 (NRMP) is considered in the Sec 32 evaluation at **Appendix 'E'.**

With regard to Sec 74 (3), the Request does not involve any trade competition (other than competition in the residential land and property market).

6.4 Sec 75 RMA91

With regard to Sec 75 (3) any relevant National Policy Statement, National Environmental Standard and the Regional Policy Statement (RPS) are considered in Sec 32 evaluation at **Appendix 'E'**.

In summary, the Request is consistent with all relevant NPS and NES and is consistent with and gives effect to the RPS.

Under Sec 75 (4) there are no relevant Regional Plan considerations. Any consents required under the Regional Plan to give effect to the development enabled by the Request will be applied for at the time of subsequent subdivision and/or development.

7.0 Documents to Support the Request

The following documents are appended:

Appendix	Assessment	Title/Author	Date
D	Assessment of Environmental Effects	Paterson Pitts Limited Partnership (Peter Dymock)	April 2021
E	Sec 32 Evaluation	Paterson Pitts Limited Partnership (Peter Dymock)	March 2021
F	Market/Economics Assessment	Economic Assessment : M E Consulting (Natalie Hampson)	March 2021
G	Integrated Transport Assessment	Carriageway Consulting (Andy Carr) Transport Assessment:	April 2021
H	Soil Contamination Assessment	Detailed Site Investigation: WSP (Elizabeth Hannon)	December 2020
I	Infrastructure Assessment	Paterson Pitts Limited Partnership (Myles Garmonsway)	February 2021

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Appendix 'A'

Land Subject to the Request

PATERSONPITTSGROUP
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0800 PPGROUP

CROMWELL BRANCH
30 The Mall
or
PO Box 84
Cromwell 9342
T 03 445 1826
E cromwell@ppgroup.co.nz

Client/Location:
Molyneux Lifestyle Village Ltd

Purpose/Drawing Title:
Proposed Private Plan Change
Pt Lots 12 & 13 DP 3194

Surveyed by:	eT	Original Size: A3	Scale: 1:2500
Designed by:			
Drawn by:	KWG		DO NOT SCALE
Checked by:	JC		
Approved by:	MG		
Job Ref: A4814_PLAN		Sheet No: 1	Revision No: A
			Date: 09/02/2021

PLOT DATE: 10 February, 2021 - 8:00 AM BY: Kathryn Germonprez

Appendix 'B'

Records of Title

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy

R.W. Muir
Registrar-General
of Land

Identifier **OT5B/1137**
Land Registration District **Otago**
Date Issued 15 June 1973

Prior References
OT4D/343

Estate	Fee Simple
Area	4.0469 hectares more or less
Legal Description	Part Lot 13 Deposited Plan 3194

Registered Owners
Molyneux Lifestyle Village Limited

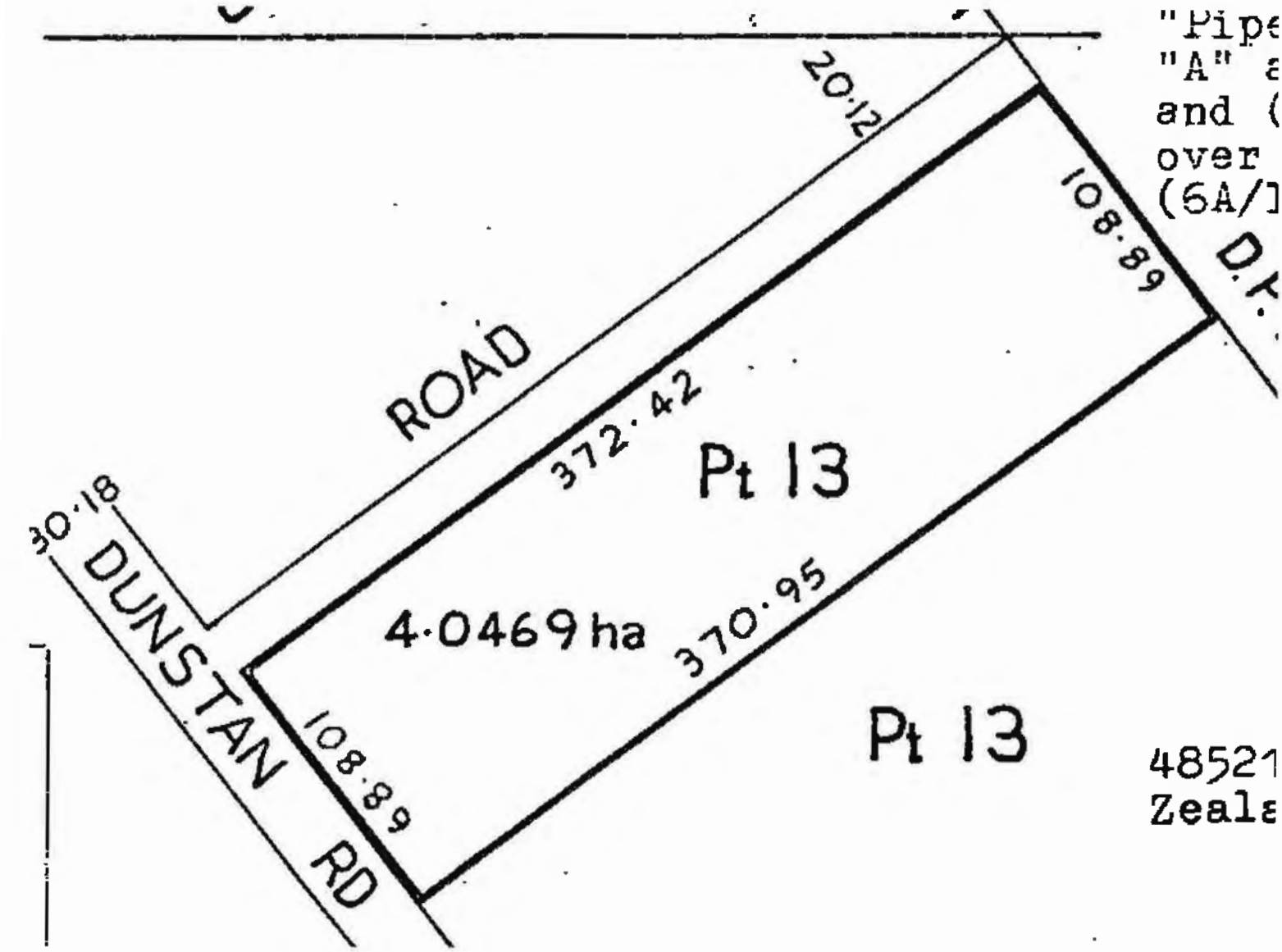
Interests

482177 Transfer creating the following easements - 29.6.1977 at 10.03 am

Type	Servient Tenement	Easement Area	Dominant Tenement	Statutory Restriction
Store water	Section 51 Block VII Leaning Rock Survey District - CT OT6A/1156	Storage easement A Transfer 482177	Part Lot 13 Deposited Plan 3194 - herein	
Convey water	Section 51 Block VII Leaning Rock Survey District - CT OT6A/1156	Line Pipeline easement Diagram A Transfer 482177	Part Lot 13 Deposited Plan 3194 - herein	
Convey water	Lot 1 Deposited Plan 12640 - CT OT6A/1154	Line Pipeline easement Diagram B Transfer 482177	Part Lot 13 Deposited Plan 3194 - herein	
Convey water	Lot 2 Deposited Plan 12640 - CT OT6A/1155	Line Pipeline easement Diagram B Transfer 482177	Part Lot 13 Deposited Plan 3194 - herein	

Subject to a right to convey water over part marked A DP 417284 created by Easement Instrument 8206380.1 - 29.6.2009 at 12:13 pm

11667841.1 Mortgage to Bruce Edward Read and Constance Mary Read - 29.1.2020 at 11:31 am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RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD

Search Copy

R.W. Muir
Registrar-General
of Land

Identifier **OT5B/1138**
Land Registration District **Otago**
Date Issued 15 June 1973

Prior References
OT4D/343

Estate	Fee Simple
Area	4.2543 hectares more or less
Legal Description	Part Lot 13 Deposited Plan 3194

Registered Owners
Molyneux Lifestyle Village Limited

Interests

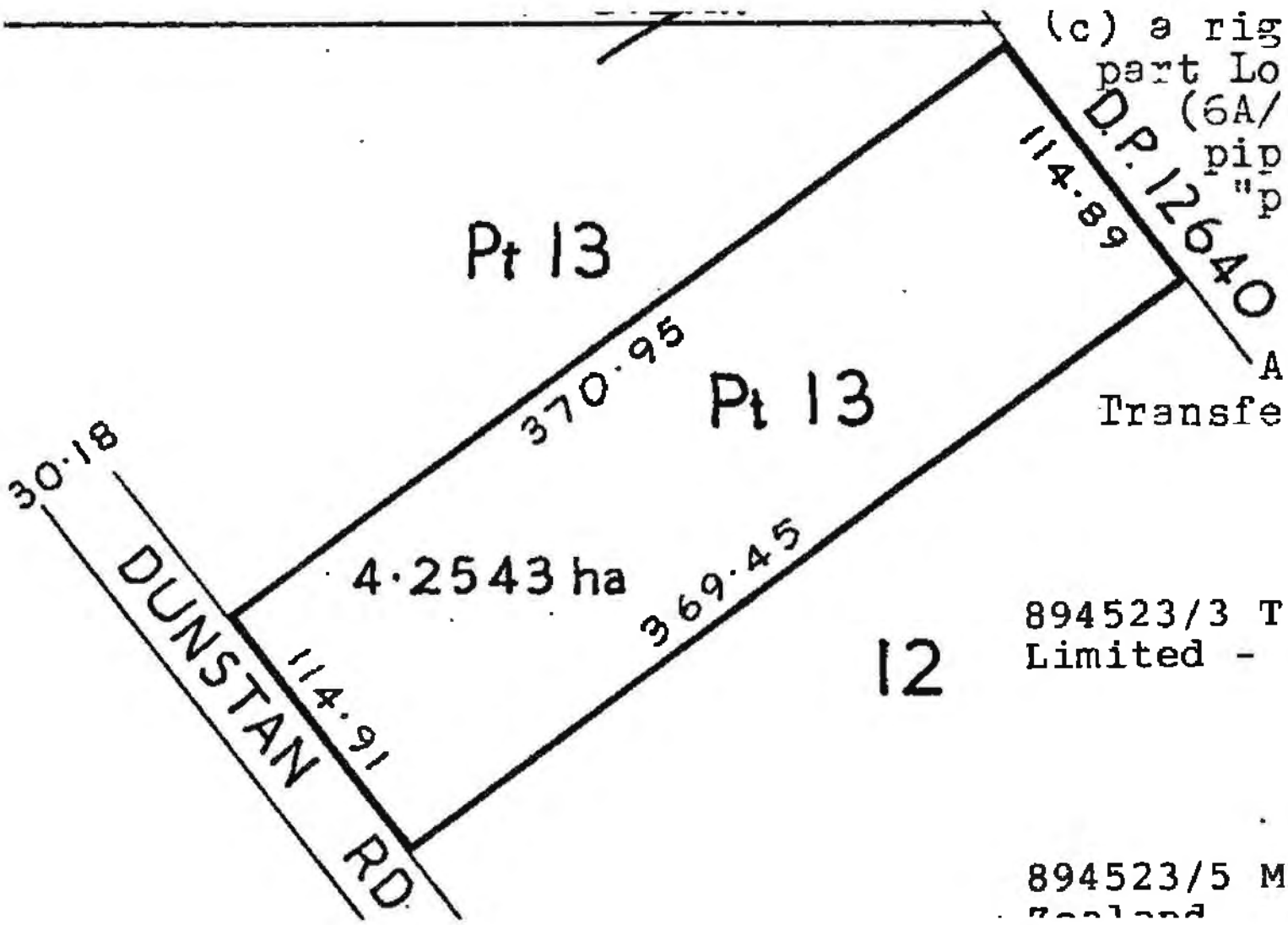
482177 Transfer creating the following easements - 29.6.1977 at 10.03 am

Type	Servient Tenement	Easement Area	Dominant Tenement	Statutory Restriction
Store water	Section 51 Block VII Leaning Rock Survey District - CT OT6A/1156	Storage easement diagram A Transfer 482177	Part Lot 13 Deposited Plan 3194 - herein	
Convey water	Section 51 Block VII Leaning Rock Survey District - CT OT6A/1156	Line Pipeline easement diagram A Transfer 482177	Part Lot 13 Deposited Plan 3194 - herein	
Convey water	Lot 1 Deposited Plan 12640 - CT OT6A/1154	Line Pipeline easement diagram B Transfer 482177	Part Lot 13 Deposited Plan 3194 - herein	
Convey water	Lot 2 Deposited Plan 12640 - CT OT6A/1155	Line Pipeline easement diagram B Transfer 482177	Part Lot 13 Deposited Plan 3194 - herein	

Subject to a right to convey water over part marked B DP 417284 and right to take and convey water over part marked C DP 417284 created by Easement Instrument 8206380.1 - 29.6.2009 at 12:13 pm

Subject to a right to convey electricity (in gross) over part marked D on DP 506529 in favour of Aurora Energy Limited created by Easement Instrument 10659232.4 - 24.4.2017 at 4:06 pm

11667841.1 Mortgage to Bruce Edward Read and Constance Mary Read - 29.1.2020 at 11:31 am



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RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD
Search Copy

R.W. Muir
Registrar-General
of Land

Identifier **OT5B/1024**
Land Registration District **Otago**
Date Issued 21 June 1973

Prior References
OT4D/344

Estate	Fee Simple
Area	4.1708 hectares more or less
Legal Description	Part Lot 12 Deposited Plan 3194

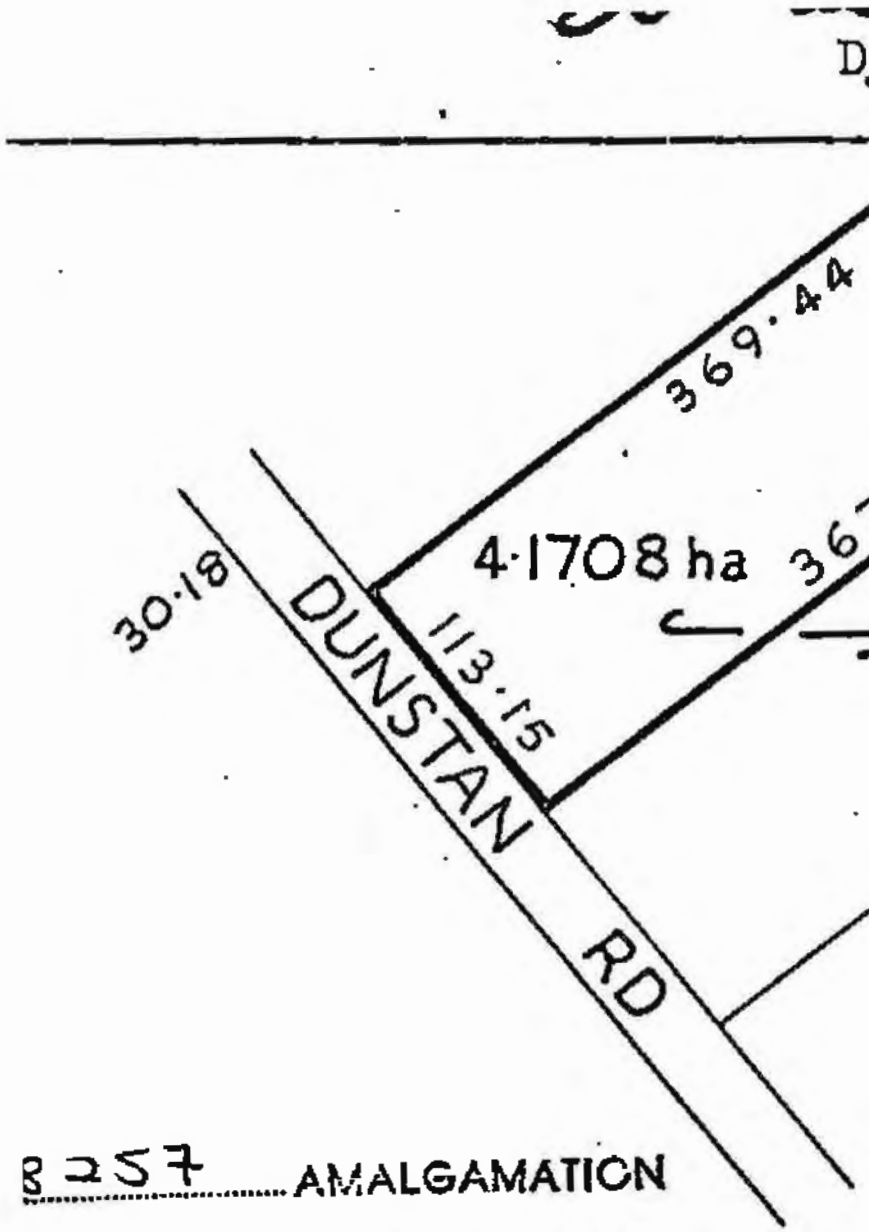
Registered Owners
Molyneux Lifestyle Village Limited

Interests

482177 Transfer creating the following easements - 29.6.1977 at 10.03 am

Type	Servient Tenement	Easement Area	Dominant Tenement	Statutory Restriction
Store water	Section 51 Block VII Leaning Rock Survey District - CT OT6A/1156	Storage Easement diagram A Transfer 482177	Part Lot 12 Deposited Plan 3194 - herein	
Convey water	Section 51 Block VII Leaning Rock Survey District - CT OT6A/156	Line pipeline easement diagram A Transfer 482177	Part Lot 12 Deposited Plan 3194 - herein	
Convey water	Lot 1 Deposited Plan 12640 - CT OT6A/1154	Line pipeline easement diagram B Transfer 482177	Part Lot 12 Deposited Plan 3194 - herein	
Convey water	Lot 2 Deposited Plan 12640 - CT OT6A/1155	Line pipeline easement diagram B Transfer 482177	Part Lot 12 Deposited Plan 3194 - herein	

11667841.1 Mortgage to Bruce Edward Read and Constance Mary Read - 29.1.2020 at 11:31 am



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RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD

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R.W. Muir
Registrar-General
of Land

Identifier **OT5B/1025**
Land Registration District **Otago**
Date Issued 21 June 1973

Prior References
OT4D/344

Estate	Fee Simple
Area	4.0620 hectares more or less
Legal Description	Part Lot 12 Deposited Plan 3194

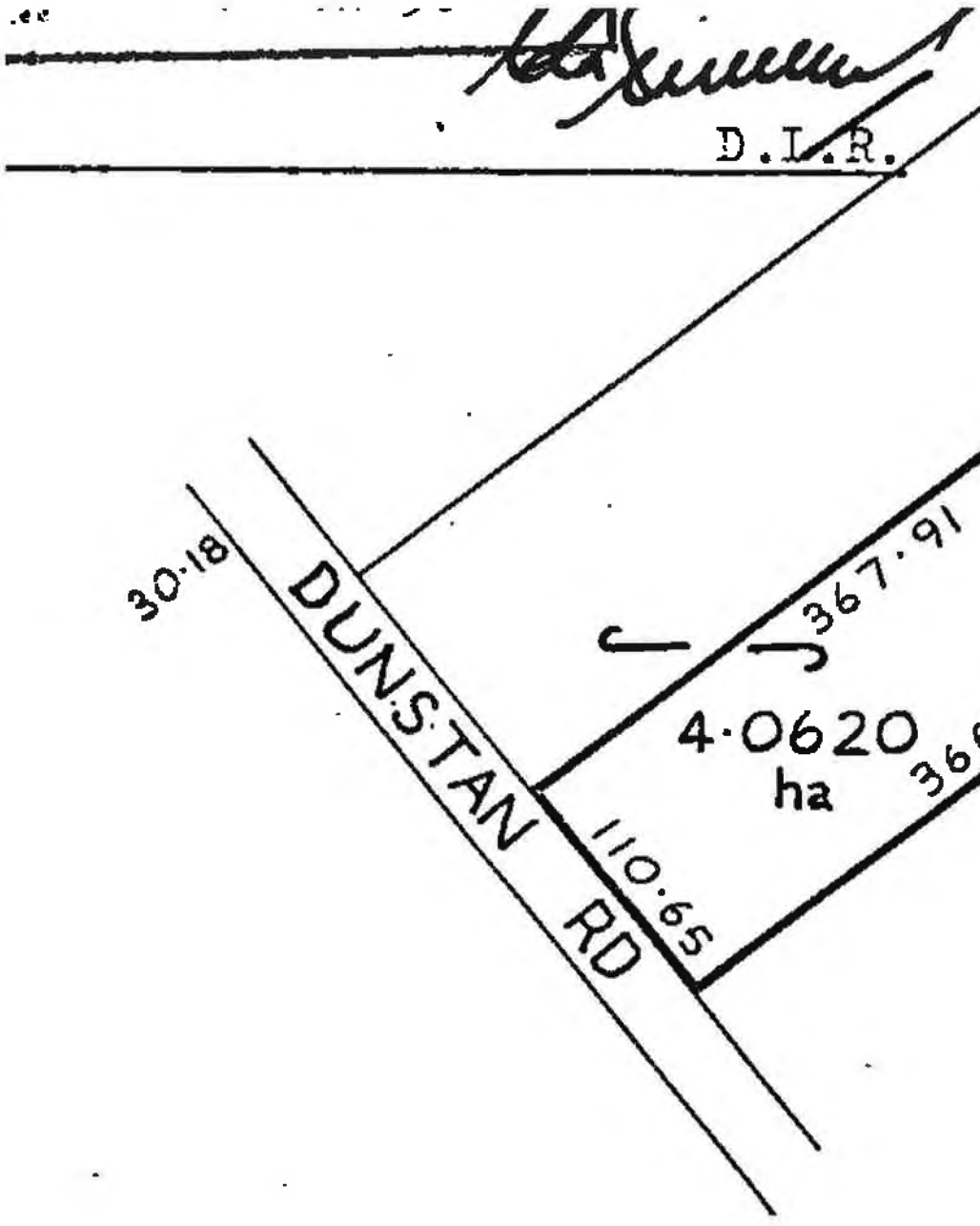
Registered Owners
Molyneux Lifestyle Village Limited

Interests

482177 Transfer creating the following easements - 29.6.1977 at 10.03 am

Type	Servient Tenement	Easement Area	Dominant Tenement	Statutory Restriction
Store water	Section 51 Block VII Leaning Rock Survey District - CT OT6A/1156	Storage Easement A Transfer 482177	Part Lot 12 Deposited Plan 3194 - herein	
Convey water	Section 51 Block VII Leaning Rock Survey District - CT OT6A/1156	Pipeline Easement A Transfer 482177	Part Lot 12 Deposited Plan 3194 - herein	
Convey water	Lot 1 Deposited Plan 12640 - CT OT6A/1154	Pipeline Easement B Transfer 482177 B	Part Lot 12 Deposited Plan 3194 - herein	
Convey water	Lot 2 Deposited Plan 12640 - CT OT6A/1155	Pipeline Easement B Transfer 482177 B	Part Lot 12 Deposited Plan 3194 - herein	

11667841.1 Mortgage to Bruce Edward Read and Constance Mary Read - 29.1.2020 at 11:31 am



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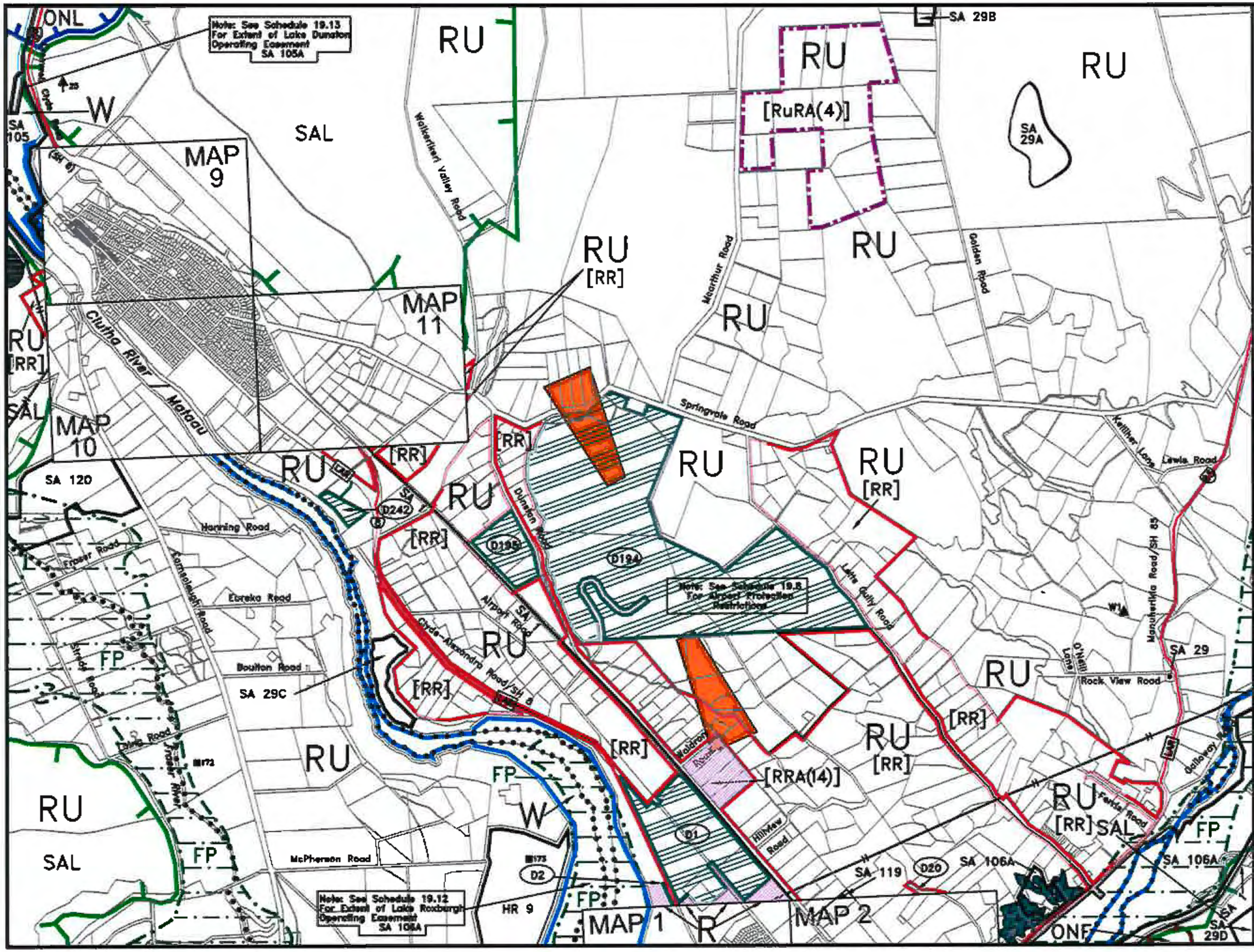
Appendix 'C'

Amended District Plan Map 42



CENTRAL OTAGO DISTRICT COUNCIL

LOCATION	ADJOINING MAPS
CENTRAL OTAGO DISTRICT	56, 57, 61, 42, 43, 70

Scale 1:30,000 (at A3)

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

metres

Northpoint Vertical

See LEGEND for key to map notations

Amended: 1 October 2008
22 October 2009
15 July 2013
20 November 2015

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

CENTRAL OTAGO DISTRICT PLAN

MAP 42

ALEXANDRA / CLYDE ENVIRONS

Julia Brown

From: David Campbell
Sent: Thursday, 3 June 2021 12:04 pm
To: Ann Rodgers
Cc: Julia Brown
Subject: FW: Molyneux lifestyle village : Private Plan Change Request

Follow Up Flag: Follow up
Flag Status: Flagged

-----Original Message-----
From: Peter Dymock <Peter.Dymock@ppgroup.co.nz>
Sent: Thursday, 3 June 2021 12:01 PM
To: David Campbell <David.Campbell@codc.govt.nz>; anne.rodgers@codc.govt.nz
Cc: rwibbotson@gmail.com
Subject: FW: Molyneux lifestyle village : Private Plan Change Request

Dear Anne

Please add the below email to the "consultation" in the AEE (sec 2.0) submitted with the Request

Yours faithfully

Peter Dymock

-----Original Message-----
From: jo Robinson <jo.hillview@gmail.com>
Sent: Thursday, 3 June 2021 10:02 a.m.
To: Peter Dymock <Peter.Dymock@ppgroup.co.nz>
Subject: Molyneux lifestyle village

Hi Peter,

Sorry about the delay in getting back to you. I wish to formally state that I am fully in favour of the proposed intention for the private plan change to rezone the William Hill site to the new residential living opportunity of smaller sections. As you are aware I have an easement running across the proposed site. I am willing to discuss the best way to move forward with this so that both parties benefit for the future.

I look forward to hearing from you in due course.

Yours faithfully

Jo Robinson

Julia Brown

From: David Campbell
Sent: Thursday, 3 June 2021 1:32 pm
To: Julia Brown
Cc: Ann Rodgers
Subject: FW: Molyneux lifestyle village : Private Plan Change Request : Preliminary Consultation
Attachments: Rail Trail letter of support.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

-----Original Message-----
From: Peter Dymock <Peter.Dymock@ppgroup.co.nz>
Sent: Thursday, 3 June 2021 1:19 PM
To: David Campbell <David.Campbell@codc.govt.nz>; Ann Rodgers <Ann.Rodgers@codc.govt.nz>
Cc: rwibbotson@gmail.com
Subject: FW: Molyneux lifestyle village : Private Plan Change Request : Preliminary Consultation

Dear Ann

Further to below email , please also include the attached letter from the Otago Central Rail Trail Trust

Yours faithfully

Peter Dymock

-----Original Message-----
From: Peter Dymock
Sent: Thursday, 3 June 2021 12:01 p.m.
To: David Campbell <David.Campbell@codc.govt.nz>; anne.rodgers@codc.govt.nz
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Hi Peter,

Sorry about the delay in getting back to you. I wish to formally state that I am fully in favour of the proposed intention for the private plan change to rezone the William Hill site to the new residential living opportunity of smaller sections.

As you are aware I have an easement running across the proposed site. I am willing to discuss the best way to move forward with this so that both parties benefit for the future.

I look forward to hearing from you in due course.

Yours faithfully

Jo Robinson

Russell Ibbotson

From: Tania Murphy <admin@otagocentralrailtrail.co.nz>
Sent: Thursday, May 27, 2021 11:37 AM
To: rwibbotson@gmail.com
Subject: PROPOSED WILLIAM HILL SUBDIVISION DEVELOPMENT
Attachments: Letter- Russell Ibbotson.pdf

Hi Russell,

Please see attached letter of support for the proposed William Hill Subdivision Development

Regards
Tania Murphy
Trust Manager
Otago Central Rail Trail Charitable Trust
PO Box 399, Alexandra 9340
027 294 7080
www.otagocentralrailtrail.co.nz

Otago Central Rail Trail Trust

27 May 2021

Russell Ibbotson
Business Consultant
PO Box 120
Alexandra 9340

Dear Russell,

RE: PROPOSED WILLIAM HILL SUBDIVISION DEVELOPMENT – 269 DUNSTAN ROAD, ALEXANDRA

Thank you for the opportunity to consider the above subdivision proposal. The matter was considered at a recent meeting of the Otago Central Rail Trail Trust and they offer the following comments:

1. The Trust consider that your proposal will not have any negative impacts on the Rail Trail itself or on the experience of Rail Trail users and support your proposal in principle.
2. It is likely that residents of the proposed subdivision will wish to gain access to the Rail Trail for recreational activity and the Trust would encourage the developers to facilitate this linkage by considering road crossing safety issues for those future residents and a cycle friendly connection to the Trail itself.

Yours sincerely

Kate Wilson
Chairperson

Email: hello@otagocentralrailtrail.co.nz
Otago Central Rail Trail Trust, 43 Dunstan Road, Alexandra
PO Box 399 Alexandra 9340, Central Otago, New Zealand

Appendix 'D'

Assessment of Environmental Effects

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MOLYNEUX LIFESTYLE VILLAGE LTD

ASSESSMENT OF ENVIRONMENTAL EFFECTS

Request for a Change to the Operative Central Otago District Plan

April 2021

DUNEDIN:
P.O. Box 5933,
Dunedin 9058.
T 03 477 3245

CHRISTCHURCH:
P.O. Box 160094,
Christchurch 8441.
T 03 928 1533

ALEXANDRA:
P.O. Box 103,
Alexandra 9340.
T 03 448 8775

CROMWELL:
P.O. Box 84,
Cromwell 9342.
T 03 445 1826

QUEENSTOWN:
P.O. Box 2645,
Queenstown 9349.
T 03 441 4715

WANAKA:
P.O. Box 283,
Wanaka 9305.
T 03 443 0110

Job No: A4814
Date: April 2021
Status: FINAL

Prepared For:
Molyneux Lifestyle Village Ltd

Prepared By:
Peter Dymock
Senior Planner/RPSurv/BSc/DipMgt/MNZIS

Paterson Pitts Limited Partnership (Alexandra Office)
8 Skird Street
P O Box 30
ALEXANDRA 9340
Telephone: +64 3 448 8775
Email: peter.dymock@pgroup.co.nz
Web: www.ppgroup.co.nz

Table of Contents

1.0 Introduction

Section 22 of the RMA 91 requires that

> *(2) where environmental effects are anticipated, the request shall describe those effects, taking into account [[clauses 6 and 7]] of Schedule 4, in such detail as corresponds with the scale and significance of the actual or potential environmental effects anticipated from the implementation of the change, policy statement, or plan]*

Schedule (4) provides that the following matters taken into account with any such environmental assessment.

> ***(6) Information required in assessment of environmental effects***
> *(1) An assessment of the activity's effects on the environment must include the following information:*
> *a) If it is likely that the activity will result in any significant adverse effect on the environment, a description of any possible alternative locations or methods for undertaking the activity:*
> *b) An assessment of the actual or potential effect on the environment of the activity:*
> *c) If the activity incudes the use of hazardous installations, an assessment of any risks to the environment that are likely to arise from such use:*
> *d) If the activity includes the discharge of any contaminant, a description of –*
> *i. The nature of the discharge and the sensitivity of the receiving environment to adverse effects; and*
> *ii. Any possible alternative methods of discharge, including discharge into any other receiving environment:*
> *e) a description of the mitigation measures (including safeguards and contingency plans where relevant) to be undertaken to help prevent or reduce the actual or potential effect:*
> *f) identification of the persons affected by the activity, any consultation undertaken, and any response to the views of any person consulted:*
> *if the scale and significance of the activity's effects are such that monitoring is required, a description of how and by whom the effects will be monitored if the activity is approved:*
> *if the activity will, or is likely to, have adverse effects that are more than minor on the exercise of a protected customary right, a description of possible alternative locations or methods for the exercise of the activity (unless written approval for the activity is given by the protected customary rights group).*

> ***(7) Matters that must be addressed by assessment of environmental effects***
> *(1) An assessment of the activity's effects on the environment must address the following matters:*
> *a) Any effect on those in the neighbourhood and, where relevant, the wider community, including any social, economic, or cultural effects:*
> *b) Any physical effect on the locality, including any landscape and visual effects:*
> *c) Any effect on ecosystems, including effects on plants or animals and any physical disturbance of habitats in the vicinity:*

d) *Any effect on natural and physical resources having aesthetic, recreational, scientific, historical, spiritual, or cultural value, or other special value, for present or future generates:*
e) *Any discharge of contaminants into the environment, including any unreasonable emission of noise, and options for the treatment and disposal of contaminates:*
f) *Any risk to the neighbourhood, the wider community, or the environment through natural hazards ... or hazardous installations.*

This assessment takes into account the technical reports in **Attachments 'D' to 'I'** of the Request, which form an integral part of the Request.

2.0 Affected Persons & Consultation

Letters, including a copy of the preliminary concept plan for a subdivision of the site, were sent out to the following owners of neighbouring properties who are considered to be affected persons, seeking preliminary comments on the Request:

Address	Person/Organisation	Response
307 Dunstan Road	A & R Kvick	Yes
	Alexandra Golf Course	No
43 Waldron Road	D & Y Kidd	No
231 Dunstan Road	F Haldom & A O'Neill	No
66 Waldron Road	R Heyward & C Colhoun	Yes
40 Waldron Road	I & L Gare	Yes
305 Dunstan Road	K Higgie	No
39 Hillview Road	M & S Conway	No
41 Waldron Road	R & S Williams	Yes

Responses received are attached at **Appendix 'A'.** None of the responders were opposed to the development , but one responder requested they be connected to the wastewater reticulation being installed within any future subdivision of the site as a "reasonable compromise" .

Several meetings were held with Council's Planning & Infrastructure staff. No infrastructure issues were identified by Council staff. No insurmountable planning impediments were raised by Council planners. A preference was expressed by the planners that the Request is not anti-pathetic to the outcome of the Vincent Spatial Plan consultation exercise.

Aukaha and the Otago Regional Council (ORC) were emailed on 2 December 2020, seeking preliminary comment on the Request. No response has been received from the ORC.

Responses from three Rūnanga were received and are attached at **Appendix A**. Two Rūnanga, Te Rūnanga o Ōtakau and Hokonui Rūnanga, were not opposed to the Request, but highlighted various matters of interest to them. The Requestor has no issues with these, however they are matters that are addressed at the subsequent detailed resource consent application stage to subdivide or develop the site.

Te Kāti Huirapa Rūnaka ki Puketeraki do not support the Request on the following grounds:

- *This Private Plan Change will result in a large subdivision. It will promote urban sprawl and increased residential density, which will impact on the amenity value of the area.*
- *There are concerns around the appropriate servicing of residential development at the site, particularly with regard to the potential contamination of ground and surface of water.*

The Rūnaka's concerns over "urban sprawl and increased residential density" are addressed elsewhere in this AEE . With regard to servicing of the site and contamination of ground and surface water, wastewater from the development will be discharged into the Alexandra town sewer reticulation and the development will be connected to the Alexandra town water reticulation as outlined in the Infrastructure Report at **Appendix J**. There is no surface water within the site and all stormwater will be discharged to land , not water.

All three Rūnaka highlighted their cultural interest in the Māta Au and Manuherikia Rivers and Waikerikeri Creek. The site is remote from all three water bodies with no connected flow path from the site to the water bodies. Subdivision and development of the site will have no effect whatever on these water bodies.

3.0 Effects Relating to Urban Land Supply & Growth.

An economic assessment of the Request has been prepared by M E Consulting and is attached at **Appendix F**.

In summary, the report finds that the key economic benefits arising from the proposed plan change include:

- *Provides housing capacity in a location of moderate market demand (i.e. in Outer Alexandra). Helps reduce a projected shortfall of dwelling capacity in Outer Alexandra in the long term.*
- *Provides a greater choice of housing for households wanting to move to or stay in Alexandra. The plan change would deliver a lot size not otherwise provided for Alexandra.*
- *The additional capacity, will facilitate greater churn in the local housing market (which can be a stimulus for redevelopment and infill), allowing households to shift within wider Alexandra as their housing needs change with life stage.*
- *Facilitates Alexandra's population growth, including growth of the Alexandra work force – supporting economic growth within Alexandra businesses and increasing the vibrancy of the town centre by facilitating demand for local shops and services.*

- *The development of the land at a large lot residential density, as opposed to operative Rural Residential or RuRA zone densities, increases the efficiency of dwelling growth in Outer Alexandra – reducing the consumption of the rural land resource for housing and helping to reduce the fragmentation of rural land and the dispersal of households.*
- *It concentrates 60 net additional dwellings in close proximity to the current urban edge. The site offers potential for active transport (particularly biking using the Central Otago Rail Trail on the opposite side of Dunstan Road).*
- *Although large lot residential properties are not targeted at 'affordable housing', it is relatively more affordable than most Rural Residential zone alternatives due to the smaller land area. The additional housing capacity will help (to a minor degree) alleviate rising dwelling prices and rents driven by the type of property delivered to the market and an imbalance between supply and demand across wider Alexandra compared with the status quo.*
- *The plan change would enable a private landowner to bring 60 new greenfield sections to the market in the short-medium term – increasing the competitiveness of the Alexandra housing market which is effectively controlled by the COD Council.*
- *The plan change would implement two out of three options proposed for the VSP – being large lot residential land use along this portion of Dunstan Road. It is also likely to deliver that proposed land use outcome sooner than if the site was reliant on a comprehensive plan change initiated by Council (i.e., will deliver housing benefits sooner rather than later).*
- *Further, if proposed options 1 or 2 are adopted the VSP, development of the plan change site in the short-medium term may help implement the land use outcomes intended elsewhere along Dunstan Road. i.e. it may stimulate the change in land use where zoning is intensified by giving surrounding landowners more confidence to subdivide and meet the market.*

The report concludes that the anticipated economic benefits of the private plan change will outweigh the potential economic costs. The plan change would positively contribute to the economic wellbeing of the Alexandra community and is consistent with strategic planning options being considered by Council.

The request will therefore have positive effects on the environment in relation to urban land supply and population growth.

4.0 Effects in Relation to Transportation

The effects of the Request on associated transportation issues are addressed in the supporting Transport Assessment at **Appendix G**. The Assessment concluded as follows:

- *Overall it is considered that the traffic generated by the development of the plan change site can be accommodated on the adjacent roading network*

without capacity or efficiency issues arising. In practice, the traffic flows on Dunstan Road are very low at present, and development of the site generates relatively little traffic, meaning that the proposed site access will operate under 'free flow' conditions, and Dunstan Road remains operating well within its maximum capacity.

- *The crash history in the vicinity of the plan change site does not indicate that there would be any adverse safety effects from the proposal. Dunstan Road is flat and straight and therefore sigh distances at the proposed site access will be excellent.*
- *The internal roads within the site are likely to be able to comply with the Council's standards. Dunstan Road itself presently does not comply with the Council's Engineering Code of Practice, as the carriageway is 6.4m wide rather than the 7.0m width expected under the Code. However in practice the development of the site generates only one additional vehicle movement on the road network at the very busiest of times, and Dunstan Road is already lightly-trafficked, meaning that in practice the current carriageway width will function adequately.*
- *Although there is presently only a Structure Plan proposed, it is likely that there will be a high degree of compliance with the transportation requirements of the District Plan and at this stage no non-compliances are expected. The plan change is also aligned with overarching strategic documents for the area.*
- *Overall, and subject to the preceding comments, the plan change request can be supported from a traffic and transportation perspective and it is considered that there are no traffic and transportation reasons why the plan change could not be approved.*

With regard to the comments on access to Dunstan Road in Sec 8.4.4.1 of the Assessment, the Request proposes a rule in the District Plan such that no direct access to Dunstan Road or Waldron Road by any lot is possible and that all access to the site be from a single access onto Dunstan Road.

5.0 Effects in Relation to Infrastructure

The supporting infrastructure report addresses stormwater disposal, wastewater, water supply, reticulated utility services and roading construction.

In summary, development facilitated by this Request is able to be serviced for infrastructure and no adverse effects will arise in relation to infrastructural services.

6.0 Effects in Relation to Natural Hazards or Hazardous Installations

A search of the Otago Regional Council's Natural Hazardous Database showed that the Otago Regional Council has no record of any natural hazard adversely affecting the site. None of the test pits excavated for the infrastructure report showed any sign of deleterious material. The site is flat and ground slope instability is unlikely to be an issue. Any engineered fills will need to be placed, compacted and certified in accordance with NZS4431:1989. This is addressed at the resource consent/land use consent stage of subsequent subdivision and development of the site.

The proposed Residential Resource Area zoning of the site does not anticipate the use of hazardous materials or hazardous installations, as per existing District Plan Rule

7.3.6(ii) which requires all land use activities to be associated with the use of the site only for residential purposes.

The winery to be retained will have existing use rights and the wastewater from the winery will be disposed of entirely within the boundaries of the winery lot , subject to a discharge consent from the ORC that is anticipated to include conditions of consent that mitigate any environmental effects .

7.0 Effects in Relation to Soil Contamination

The Detailed Site Investigation (DSI) prepared by WSP addresses this issue.

The report found that, apart from a very small area of fuel spill around a former above ground storage tank and a small waste pit of burnt material, the site is suitable for residential development.

The remedial work required is to strip the site of the small areas of fuel spill and burnt material in the waste pit and remove from the site to a central landfill. The waste pit will then be filled with certified compacted hard fill in accordance with NZS4431:1989 (Code of Practice for Earth Fill for Residential Development).

These matters are addressed at the subsequent resource consent stage, including provision of an approved Remedial Action Plan (RAP). Overall, there is no impediment to the development of the site for residential purposes from soil contamination that cannot be easily remediated.

8.0 Effects on Cultural Values & Other Special Values

So far as the Requestors are aware, the site does not contain any special ecosystems, natural habitats, or sites of recreational, cultural, scientific, historical or spiritual value.

Possible disturbance of unknown cultural remains is best covered at the subsequent resource consent stage of developing the site by conditions of consent imposing an accidental discovery protocol. Possible disturbance of unknown archaeological sites by earthworks is governed by the requirements of the Heritage NZ Pouhere Taonga Act (2014).

9.0 Discharge of Contaminants & Unreasonable Emission of Noise

Wastewater will be discharged to the Council reticulation and stormwater direct to land within the site. The residential zoning of the site will ensure that there will be no emission of unreasonable noise from the site. Noise emission is governed by existing District Plan Rule 12.7.4. As previously stated, Wastewater from the winery will be discharged to ground entirely within the confines of the winery lot.

10.0 Landscape Effects

The land subject to this Request is in an "Other Rural Landscape" (ORL), the third tier landscape classification in the District Plan, being less sensitive than an Outstanding Natural Landscape (ONL) or a Significant Amenity Landscape (SAL). Public views of the site are available from the immediately adjoining Dunstan & Waldron Roads. Because the site is flat and located in a flat landscape, distant views of the site are limited. Future residential development on the site will also be visible from neighbouring rural lifestyle properties, the Rail Trail and the Alexandra Golf Course.

The Request provides for approximately 60 "large lot" residential sections of a minimum lot size of 2000m^2.

The attached plan at **Appendix 'B'** illustrates one possible option for the ultimate development of the site, were it to be subdivided to the maximum theoretical lot yield. Note that the Requestor intends for the two existing dwellings on site to remain and for the winery to remain in operation. This will also require relocation of the winery waste disposal field, hence the larger (7000m^2) size of the winery lot.

Judging by similar "large lot" areas elsewhere in the District, it can be expected that the lots will contain large standalone single-story dwellings with generous garaging and extensive irrigated landscaping and other accessory buildings such as large sheds/workshops/lofts etc. On-site boat/caravan/motorhome storage is also a feature of these areas.

The inevitable result of the re-zoning of the site will therefore be a change from a predominately open rural aspect to that of a more urban character albeit with generous spacing and separation of dwellings and larger trees than normally prevail in higher density residential resource areas. Fig 1 below shows the appearance of the RRA (6) "large lot" zone in Cromwell (Bell Avenue).

A more "softer" semi-rural look to the development can be anticipated with grassed swales instead of a hard "kerb and channel" edge to road carriageways, street trees and no street-lighting or footpaths.

Landscape effects cannot therefore be avoided, but they are not necessarily adverse and will be mitigated by the semi-rural "large lot" nature of the development. Landscape change is inevitable if suitable developed land is to be made available to provide for the future growth of Alexandra.

In time, similar development will occur along Dunstan Road extending from the current town boundary to this site, as anticipated by the Vincent Spatial Plan.

It is concluded that the positive effects of this proposal in providing for the future growth of Alexandra in a matter that satisfies the demand for "large lot" residential living not provided for in the current District Plan outweigh any minor adverse effects on landscape values.

11.0 Effects in Relation to the Land Resource

The site identified on Landcare Research's land use capability database as having "severe limitations for arable or cultivation" (i.e. equivalent to the former "Class IV" Land Inventory Unit). See attached map at **Appendix 'C'**. There is no indication that the land subject to this Request is suitable for horticultural development.

The site is within the lowest rainfall area in New Zealand (350-450mm/annum) and the realisation of any productive potential of the land resource is totally dependent on a suitable irrigation supply.

The site was formerly occupied by the "William Hill" vineyard, but this proved to be uneconomic, and the vineyard went into receivership and has since had to be removed. The site was formerly irrigated from the Manuherikia Irrigation Scheme, but this no longer applies and there are, in any case, no easements to convey and store water from the scheme's head race in Hillview Road through adjoining properties to the site. The Requestor has made strenuous efforts to obtain these easements, to no avail.

The Requestor has a 80m³/day (0.9 litres/sec) water right from the Otago Regional Council to take water from an on-site bore (RM 2001.148). According to the ORC's "Aqualinc Report" (Guidelines for Reasonable Irrigation Requirements in the Otago Region – C15000 dated 2017/07/24), this is sufficient in this location to irrigate only 1.5ha of stone fruit, 3.3ha of grapes or 1.5 ha of pasture/crops.

However, this does not take into account the fact that the bore pump cannot operate continuously 24 hours/day, every day. A higher instantaneous rate of take is therefore required to apply the same amount of water per day. Therefore, a more realistic figure is 1.0ha of stone fruit and pasture and 2.5ha of grapes. In addition, there has to be an allowance for frost fighting as any frost fans located on this site would not comply with the permitted activity rules of the District Plan. Frost fighting typically requires an application rate of 5mm per hour for a 6-hour frost duration. This amounts to some 300m³ per ha at a rate of 14L/s. The applicant's total take allowance is only 80m³ /day at a maximum rate of 4.25L/s

These small irrigable areas are simply not a realistic economic proposition with the water right the Requestor holds out of the onsite bore.

The existing zoning of the site (Rural Residential) also pre-supposes that the predominate use of the site will be for residential purposes, as evident by similar properties fronting Dunstan Road, none of which are subject to any significant productive use. The site can be subdivided into 8 rural residential allotments (more if an element of staging was used) as a controlled activity under its existing zoning and it is very unlikely that any significant commercially viable productive use would be made of these lots, even if there was a suitable irrigation supply. Given how close such lots would be to Alexandra . plus the lack of an irrigation supply, residential use would be the primary activity on them .

It is considered that the Request will have limited effect in terms of maintaining the capability of any productive land resource.

12.0 Effects on Adjoining Properties

The only productive land use in the vicinity is a vineyard across from the north- west corner of the site. However, this is well separated from the site by Dunstan Road and the Rail Trail with intervening large pine trees on the Rail Trail and on the Golf Course.

Reverse sensitivity is unlikely to be an issue. The Rural Amenity Values enjoyed by residents of Dunstan and Waldron Roads will be affected to some extent . However, such effects are inevitable where rural land in close proximity to an existing urban area is released for residential subdivision and development. The Requestor believes that it is an unrealistic expectation for such residents that their land will remain rural in

perpetuity, given the demand for land for housing consequent upon an increasing population.

A restrictive "no complaints" private covenant will be registered on all titles for residential lots within the development in favour of the winery lot, which will address any reverse sensitivity issues with a commercial winery operation located in a residential resource area.

13.0 Conclusion

In summary, the Request will have no significant adverse effects on the environment. Any adverse effects are less than minor, have been recognised and their avoidance or mitigation has been provided for in the Request.

The net effects of the Request are, on balance, overwhelmingly positive.

Appendix 'A'
Response to Consultation

Aukaha

23 April 2021

Paterson Pitts Group
P O Box 84
CROMWELL 9342

Attention: Peter Dymock

Preliminary Statement – Molyneux Lifestyle Village Ltd
Private Plan Change
Dunstan Road, approximately 1km north of the Alexandra Town boundary – Alexandra

In regards to information received 2 December 2020. We have reviewed the information supplied to date, which at this stage of the project is limited. Our preliminary comments are as follows:

For Te Rūnanga o Ōtakou and Hokonui Rūnanga issues would most likely focus on:

- Management and mitigation measures to be considered for archaeological/cultural heritage values in the surrounding area.
- Management and mitigation measures to be taken on sediment run-off during any earthworks.
- Management and mitigation measures to be taken on effects to any waterway ie. water quality and quantity.
- Management of excess excavated material.
- Management and mitigation measures to be taken on effects to the vegetation in the proposed area of works.
- Management and mitigation measures to be taken regarding the visual and environmental impact of the cultural landscape.
- Management and mitigation measures to be considered for ecological restoration and revitalisation of local native bird populations.

The site is in the vicinity of the Mata-au/Clutha River which is a statutory acknowledgement area. The Mata-au itself is significant as a mahika kai, a means of transport and for the relationship between those living there and the water. The ability to provide highly valued food to visitors was, and remains, important for the mana for local manawhenua. The river itself was an important trail, providing direct access into Lakes Wānaka, Hāwea and Wakatipu/Whākatipu-wai-māori from coastal Otago.

The nearby Manuherekia/Manuherikia River is significant as a kāinga nohoanga and kāinga mahinga kai, particularly for tuna (eels), amongst many other species.

Waikirikiri/Waikerikeri Creek and Kāmoanahaehae (the junction of the Mata-au and Manuherekia) are also significant nearby water bodies.

Aukaha
Level 1, 258 Stuart Street, P O Box 446, Dunedin 9054, New Zealand
Phone - 03 477 0071
info@aukaha.co.nz www.aukaha.co.nz

Te Rūnanga o Ōtākou and Hokonui Rūnanga would request that the following recommendations be added to the archaeological assessment for an archaeological authority:

- If any Māori material is discovered, NZHP will assist Molyneux Lifestyle Village Ltd in contacting all relevant parties, including HNZPT and mana whenua. If any Taoka Tūturu are uncovered, they will, prima facie, belong to the Crown. NZHP, in collaboration with mana whenua, shall submit them for custody until such time as traditional or actual ownership is determined, with an appropriate institution or kaitiaki.

- A manawhenua representative or archaeologist approved by Te Rūnanga Ōtākou, Kāti Huirapa Rūnaka ki Puketeraki, and Hokonui Rūnanga should be contacted and be present should any archaeological finds of Māori origin be uncovered.

Please note that this reply is made without prejudice, and should **not** be seen as written approval.
The Rūnanga reserves the right to reconsider its position in light of additional information and/or research.

Thank you for seeking our feedback at this early stage and encourage consultation throughout the development of the above proposal.

Nāku noa, nā

Tania Richardson
Consents Officer

cc Te Rūnanga o Ōtākou
Hokonui Rūnanga

HERITAGE NEW ZEALAND
POUHERE TAONGA

Heritage New Zealand Pouhere Taonga Accidental Discovery Protocol

This protocol does not apply when an archaeological authority issued under the Heritage New Zealand Pouhere Taonga Act 2014 is in place.

Under the Heritage New Zealand Pouhere Taonga Act (2014) an archaeological site is defined as any place in New Zealand that was associated with human activity that occurred before 1900 and provides or may provide, through investigation by archaeological methods, evidence relating to the history of New Zealand. For pre-contact Māori sites this evidence may be but is not limited to, bones, shells, charcoal, stones etc. In later sites of European/Chinese origin, artefacts including but not limited to bottle glass, crockery etc. may be found, or evidence of old foundations, well, drains, or similar structures. Burials/koiwi tangata may be found in association with any of these cultural groups.

In the event that an unidentified archaeological site is located during works, the following applies;

1. Work shall cease immediately at that place and within 20m around the site.
2. The contractor must shut down all machinery, secure the area, and advise the Site Manager.
3. The Site Manager shall secure the site and notify the Heritage New Zealand Regional Archaeologist. Further assessment by an archaeologist may be required.
4. If the site is of Maori origin, the Site Manager shall notify the Heritage New Zealand Regional Archaeologist and the appropriate iwi groups or kaitiaki representative of the discovery and ensure site access to enable appropriate cultural procedures and tikanga to be undertaken, as long as all statutory requirements under legislation are met (*Heritage New Zealand Pouhere Taonga Act, Protected Objects Act*).
5. If human remains (koiwi tangata) are uncovered the Site Manager shall advise the Heritage New Zealand Regional Archaeologist, NZ Police and the appropriate iwi groups or kaitiaki representative and the above process under 4 shall apply. Remains are not to be moved until such time as iwi and Heritage New Zealand have responded.
6. Works affecting the archaeological site and any human remains (koiwi tangata) shall not resume until Heritage New Zealand gives written approval for work to continue. Further assessment by an archaeologist may be required.
7. Where iwi so request, any information recorded as the result of the find such as a description of location and content, is to be provided for their records.
8. Heritage New Zealand will advise if an archaeological authority under the *Heritage New Zealand Pouhere Taonga Act* 2014 is required for works to continue.

It is an offence under S87 of the *Heritage New Zealand Pouhere Taonga Act 2014* to modify or destroy an archaeological site without an authority from Heritage New Zealand irrespective of whether the works are permitted or consent has been issued under the Resource Management Act.

Heritage New Zealand Archaeologist contact details:

Nikole Wills
Regional Archaeologist Otago/Southland
Heritage New Zealand
PO Box 5467
Dunedin
Ph. +64 3 470 2364, mobile 027 240 8715
Fax. +46 3 477 3893
nwills@heritage.org.nz

Peter Dymock

From: Robert & Annette Kvick <kvick@xtra.co.nz>
Sent: Tuesday, 12 January 2021 9:35 p.m.
To: Peter Dymock
Subject: "William Hill"

Hi Peter

Thanks for the information and plans concerning the William Hill site.

We think the proposed subdivision looks good and strongly recommend that the subdivision goes ahead, Alexandra needs progress.

Regards

--
Rob & Annette Kvick
Alexandra

Peter Dymock

From: Kate Colhoun <krhcheyward@gmail.com>
Sent: Sunday, 31 January 2021 8:58 a.m.
To: Peter Dymock
Subject: Re: Proposed Private Plan Change - "William Hill" Site - Molyneux Lifestyle Village Ltd.

Hi Peter

Thank you for the opportunity to give feedback on the proposed plan change request. We believe the current zoning of rural residential is appropriate for the area and we would not support a zone/plan change in respect to Molyneaux lifestyle village.

Best wishes
Richard Heyward and Kate Colhoun

Peter Dymock

From: Ian Gare <ianandlyndagare@gmail.com>
Sent: Friday, 12 March 2021 11:49 a.m.
To: Peter Dymock
Cc: rwibbotson@gmail.com
Subject: Proposed William Hill Subdivision

Hi Peter

I wanted to send you through an email with our thoughts on the proposed William Hill subdivision as an immediate neighbour.

After reviewing the plans we are very much in support of the proposal as it stands and would strongly recommend that the subdivision progresses.

Our belief is that this subdivision fills a great need in the Alexandra community that has struggled with section availability over the last several years. It also sits in a niche part of the market that is currently not available in which families want larger residential sections that still have a close proximity to the township. The location of the subdivision adjacent to the rail trail and golf course would be extremely attractive to many and would reduce the vehicle movements that we are getting from some of the far reaching rural subdivisions currently being undertaken.

Kind Regards

Ian & Lynda Gare
40 Waldron Road, Alexandra
027 505 4114

Peter Dymock

From: Simon Williams <simon_williams@ais.com.sg>
Sent: Saturday, 30 January 2021 5:33 p.m.
To: Peter Dymock
Cc: Rebecca Rodgers
Subject: Proposed Private plan change

To Whom it may concern,

In reply to our thoughts on a proposed private plan change on the William Hill site in close proximity to our property at 41 Waldron Road.

The reason we bought property here was the fact that it was semi-rural and more of a lifestyle block that would be quieter than living in town. The proposal of building a significant number of houses neighboring our property will definitely change this.

We are also unsure of the impact this might have on the value of our property moving forward as it would no longer have the appeal of a lifestyle block when it would be close to a residential area.

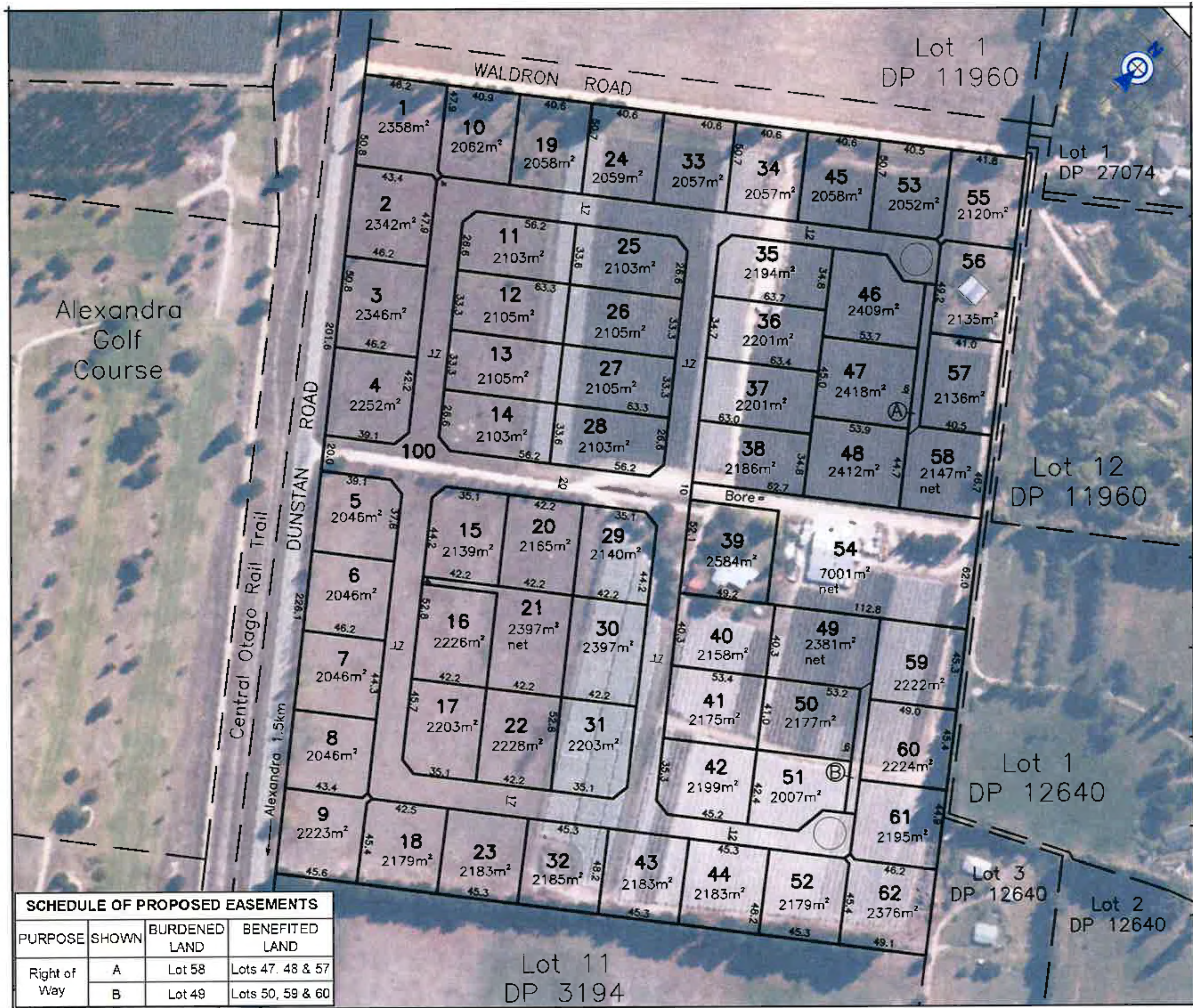
However, while we also don't oppose progress in the area, we would be impacted by this proposal.

As a close neighbour we would like you to consider the possibility of providing us access and connection to your sewage and water system that will be established. We think that connecting us to the systems you put in place for the subdivision would be a fair compromise in this instance and would be interested in hearing your thoughts around this.

Thanks,

Simon & Rebecca Williams

Appendix 'B'
Possible Subdivision



Notes

- All lots subject to possible easements for power, telecom, water supply & wastewater.
- Areas & dimensions subject to resource consent and legal survey.
- Lot 100 to vest as legal public road in CODC.

SCHEDULE OF PROPOSED EASEMENTS

PURPOSE	SHOWN	BURDENED LAND	BENEFITED LAND
Right of Way	A	Lot 58	Lots 47, 48 & 57
	B	Lot 49	Lots 50, 59 & 60

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CROMWELL BRANCH
30 The Mall,
or
PO Box 84,
Cromwell 9342.
T 03 445 1826
E cromwell@ppgroup.co.nz

Client/Location:
Dunstan Road Subdivision

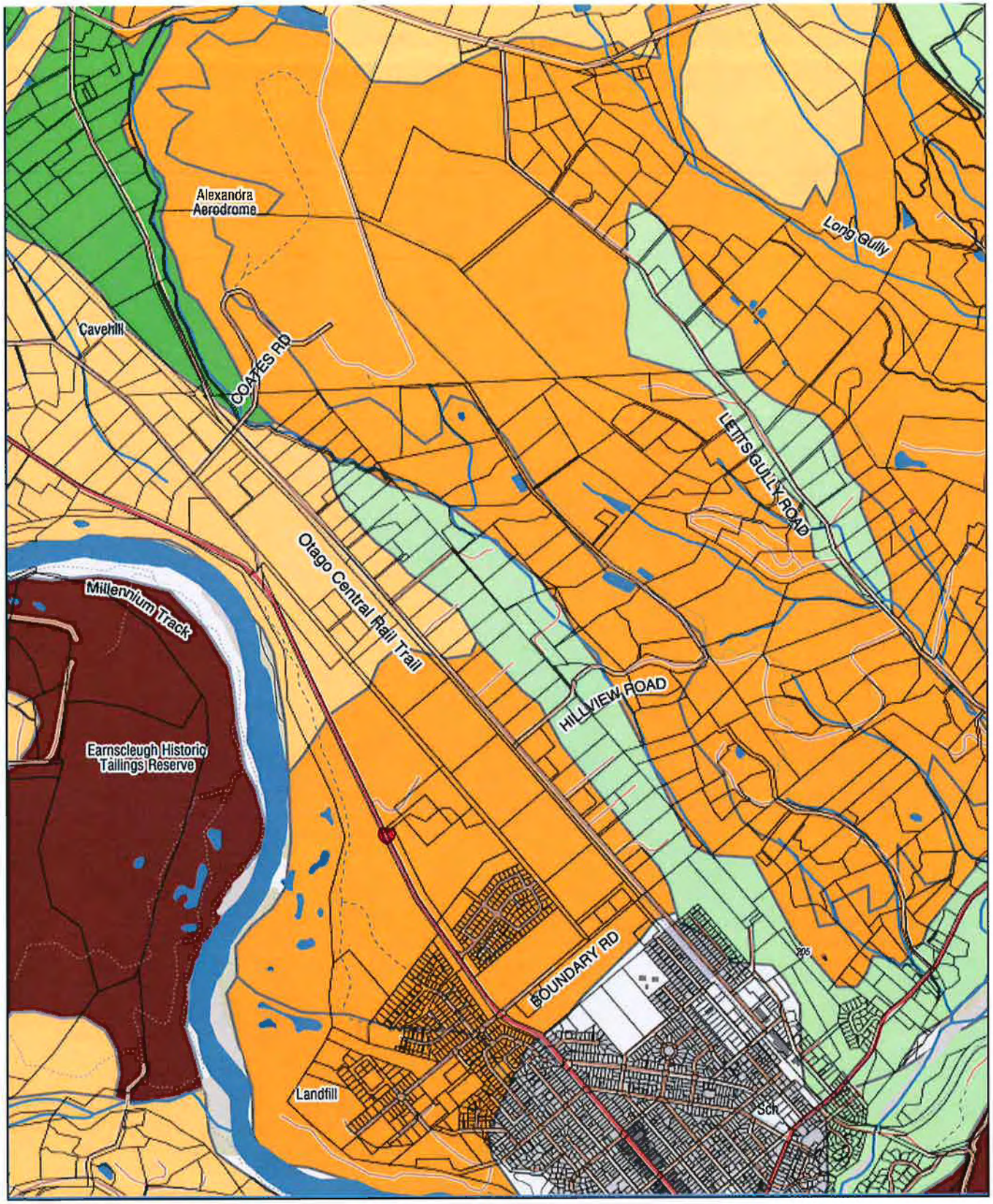
Purpose/Drawing Title:
Lots 1 - 62 & 100 Being a Subdivision of Pt's Lot's 12 & 13 DP 3194

Surveyed by:	-	Original Size: A3	Scale: 1:2000
Designed by:	PD		
Drawn by:	KWG		
Checked by:	PD		
Approved by:	PD		DO NOT SCALE
Job No: A4814_SCM	Sheet No: 2	Revision No: B	Date Created: 21/09/2020

PLOT DATE: 22 September 2020 BY: Kathryn Germaney
J:\A_4814 MOLY LIFE\CAD\A4814_SCM_2B.DWG

Appendix 'C'
Land Inventory Map

Land Use Capability



OURENVIRONMENT

Scale: 1:25,000

0 200 400 600 800m

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Printed: 16:37:16 PM Fri, 12 Feb 2021

Legend

Land Use Capability

- Arable. Multiple-use land; few limitations
- Arable. Good land; slight limitations
- Arable. Moderate limitations; restricting crop types
- Arable. Severe limitations for arable or cultivation
- Non-arable. Unsuitable for cropping
- Non-arable. Productive pastoral hill country
- Non-arable. Moderate to very severe limitations
- Non-arable. Very severe to extreme limitations

OURENVIRONMENT

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Appendix 'E'

Sec 32 Evaluation

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MOLYNEUX LIFESTYLE VILLAGE LTD

Evaluation under Section 32 of the Resource Management Act 1991

Request for a Change to the Operative Central Otago District Plan

March 2021

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CHRISTCHURCH: P.O. Box 160094, Christchurch 8441. **T** 03 928 1533
ALEXANDRA: P.O. Box 103, Alexandra 9340. **T** 03 448 8775
CROMWELL: P.O. Box 84, Cromwell 9342. **T** 03 445 1826
QUEENSTOWN: P.O. Box 2645, Queenstown 9349. **T** 03 441 4715
WANAKA: P.O. Box 283, Wanaka 9305. **T** 03 443 0110

Job No: A814
Date: March 2021
Status: FINAL

Prepared For:
Molyneux Lifestyle Village Ltd

Prepared By:
Peter Dymock
RPSurv/BSc/DipMgt/MNZS

Paterson Pitts Limited Partnership
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Contents

1.0 Introduction

The Request needs to be evaluated in accordance with Sec 32 of the Resource Management Act 1992. Sec 32 states:

"32 Requirements for preparing and publishing evaluation reports

(1) An evaluation report required under this Act must –
(a) Examine the extent to which the objectives of the proposal being evaluated are the most appropriate way to achieve the purpose of this Act; and
(b) Examine whether the provisions in the proposal are the most appropriate way to achieve the objectives by –
(i) Identifying other reasonably practicable options for achieving the objectives; and
(ii) Assessing the efficiency and effectiveness of the provisions in achieving the objectives; and
(iii) Summarising the reasons for deciding on the provisions; and
(c) Contain a level of detail that corresponds to the scale and significance of the environmental, economic, social, and cultural effects that are anticipated from the implementation of the proposal.

(2) An assessment under subsection (1)(b)(ii) must –
(a) Identify and assess the benefits and costs of the environmental, economic, social and cultural effects that are anticipated from the implementation of the provisions, including the opportunities for –
(i) Economic growth that are anticipated to be provided or reduced; and
(ii) Employment that are anticipated to be provided or reduced; and
(b) If practicable, quantify the benefits and costs referred to in paragraph (a); and
(c) Assess the risk of action or not acting if there is uncertain or insufficient information about the subject matter of the provisions.

(3) If the proposal (an amending proposal) will amend a standard, statement, regulation, plan, or change that is already proposed or that already exists (an existing proposal), the examination under subsection (1)(b) must relate to –
(a) the provisions and objectives of the amending proposal; and
(b) the objectives of the existing proposal to the extent that those objectives –
(i) are relevant to the objectives of the amending proposal; and
(ii) would remain if the amending proposal were to take effect..."

The objectives of the Request are:

- To re-zone the site to provide sufficient "large lot" residential development capacity to satisfy the reasonably foreseeable demand for such housing in the Alexandra area.
- To provide for larger section of sizes to enable choice of housing typologies to cater for changing demographics and market preferences, which is not currently well provided for in the District Plan for the Alexandra area.
- To retain flexibility to respond to changing market place preferences in an efficient manner.
- To provide for a high level of residential amenity and a safe and efficient transport network that integrates well into the existing Alexandra Township.

2.0 Options for Achieving the Objectives of the Request

There are a number of options to achieve the objectives of the Request which are outlined and discussed below

Potential Options	Discussion
Do nothing: Retain the Rural-Residential zoning of the site	This option would require resource consents to achieve the objectives of the Request. This creates the following costs: (a) Non-complying subdivision and land use consents would be required to breach almost all of the Rural Resource Area Rules for residential activity. (b) This would create significant transaction costs for applicants and an administrative burden for Council which would be incurred repeatedly and be extremely inefficient for achieving the objectives of the Request. (c) Uncertain outcomes from numerous, public processes. This potential option is not reasonably practical, has already been rejected by Council under a previous resource consent application and will not be considered further in this evaluation.
Await Council District Plan Review	The Central Otago District Plan is due for review and an option may be to await the review and then submit requesting suitable zoning for the site. (a) There is no firm timetable for this review and it is now unlikely to happen given the pending repeal and replacement of the RMA91. (b) Council initiated changes to the Operative District Plan consequent upon the Vincent Spatial Plan may be years away. Given the market circumstances, the pressure on the Alexandra housing market, the Requestor wishes to proceed with its re-zoning proposal now, rather than wait for Council's initiated plan changes. Accordingly, this option will not be considered further in this evaluation.
Request a Private Plan Change that seeks to rezone the site to an existing resource area, subject to modifying the zoning provisions to enable site specific requirements.	This option is potentially efficient as it utilises and modifies an existing resource area (the Residential Resource Area) within the District Plan. This option is reasonably practical and is considered further below.
Request a Private Plan Change to create an entirely new resource area with bespoke planning provisions.	This option is for a "Master planned" form of development This option may have some advantages and is considered further below.

Based on the evaluation above, the potential options that are reasonably practical and worth considering further are:

Option 1 Request a Private Plan Change to change the zoning of the site to an existing resource area and to modify the zoning provisions (policies and rules) of the resource area to enable site-specific requirements.

Option 2 Request a Private Plan Change to create a new bespoke resource area.

3.0 Evaluation of the Costs & Benefits of the Preferred Options

Option 1:	Re-zone the site with an existing zone (Residential Resource Area)
Benefits	* The existing zoning is well understood and can be easily implemented. * Compatible with the existing zoning provisions in the District Plan. * Provides flexibility to respond to changing market and social and economic preferences. * Provides for a range of housing styles and larger lot sizes.
Costs	* Provides less certainty to Council and community as to the outcome of development of the site.
Efficiency	* Only minor amendments required to District Plan, therefore less costs to Council and requester. * Avoids over-complicating the District Plan.
Effectiveness	* Simple and effective method of achieving the objectives of the Request.
Risk of acting (or not acting)	* By not acting, there is the risk that the land ownership would be fragmented by further rural - residential development of the site which would be a lost opportunity to achieve a more efficient and effective use of the land and infrastructure resources. There is no significant risk with proceeding with the Request.

Option 2:	Re-zone the site with a bespoke zoning
Benefits	* Providing some certainty to Council and Community as the out come of the development of the site, typically by way of a "masterplan".
Costs	* Expensive to implement for both the Council and the Requestors requiring detailed design at the outset. * Does not respond well to changing market preferences and socio-economic conditions which can often require further plan changes, and/or non-complying resource consents to implement. * Users of the plan may be unfamiliar with the bespoke provisions.
Efficiency	* Complex changes required to District Plan.
Effectiveness	* Can be an effective way of achieving the objectives of the Request.
Risk of acting (or not acting)	* As above.

On balance, it is considered that the most preferable option is to request a Private Plan Change to change the zoning of the site to the District Plan's existing Residential Resource Area with minor modifications to the rules and objectives to enable site-specific requirements to be met.

4.0 Evaluation of the Request Against the District Plan's Objectives and Policies

Sections 6 & 7 of the District Plan has a number of objectives and supporting policies that are relevant to the proposed change:

It is proposed that these existing objectives and policies be retained with only a minor amendment to an existing policy. An evaluation of the Request against these provisions follows.

4.1 Objectives

Obj 6.3.1 *Needs of People and Communities*

To promote the sustainable management of the urban areas in order to:

(a) Enable the people and communities of the district to provide for their social, economic and cultural wellbeing and for their health and safety; and

(b) Meet the present and reasonably foreseeable needs of these people and communities.

Obj 6.3.2 *Amenity Values*

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

Obj 6.3.3 *Adverse Effects on Natural and Physical Resources*

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

Obj 7.1.1 *Maintenance of Residential Character*

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

Obj 7.1.2 *Protection of Living Environment*

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

Obj 7.1.3 *Management of Change*

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

The Request will enable the people and community of Alexandra to provide for their wellbeing by increasing residential capacity to meet the needs of the growth of Alexandra. The request will enable larger lot sizes for the community to access residential property relative to their needs, an option of which is not currently well provided for in the District Plan. An increase in residential capacity will go some way to addressing the shortage of housing supply, a factor (but far from the only one) impacting on housing affordability in Alexandra.

The Request successfully manages change at the interface with the Rural Residential Resource Area.

4.2 Policies

Pol 6.4.1 *Maintenance of Quality of Life Within Urban Areas*

To maintain and, where practicable, enhance the quality of life for people and communities within the district's urban areas through:

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

Pol 6.4.2 *Expansion of Urban Areas*

To enable the expansion of urban areas or urban infrastructure in a manner that avoids, remedies or mitigates adverse effects on:

(a) *Adjoining rural areas.*
(b) *Outstanding landscape values.*
(c) *The natural character of water bodies and their margins.*
(d) *Heritage values*
(e) *Sites of cultural importance to Kai Tahu ki Otago.*
(f) *The integrity of existing network utilities and infrastructure, including their safe and efficient operation.*
(g) *The life supporting capacity of land resources.*
(h) *The intrinsic values of areas of significant indigenous vegetation and habitats of significant indigenous fauna.*

Pol 7.2.1 *Residential Character*

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

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

7.2.2 *Amenity Values*

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

7.2.6 *Safety and Efficiency of Residential Roads*

To require appropriate access and on-site parking to ensure that the amenity of neighbouring properties and the safe and efficient operation of roads is maintained while acknowledging that these requirements may be relaxed where this will result in retention of a heritage item or site that would otherwise be lost.

7.2.7 *Residential Resource Areas (1) – (14)*

The addition of reference to the proposed RRA(14) sub-zone is necessary to provide policy support to the Request.

The rules that give effect to these policies will remain unchanged, apart from minor site specific modifications. This will ensure compliance with Policies 7.7.15, 7.2.2 & 7.26.

In summary, the Request complies with and gives effect to the District Plan's relevant objectives and policies.

5.0 Evaluation of the Request's Methods & Rules

Plan Provision/Rule	Discussion
7.3.3 (i) (c) Addition to this rule to provide that the minimum lot size is the [RRA(14)] subzone is 2,000m^2	This rule is required to give effect to the objectives of the Request.
7.3.6 (iii) (c) Addition to this rule to provide for all side yards in the [RRA(14)] sub zone to be 3 metres.	The objective of "large lot" residential developments is to provide for more spacious areas of land around dwellings and to provide a greater degree of separation of dwellings and privacy, than prevails in standard low, medium and high density residential developments. A larger side minimum yard gives effect to this and is consistent with other "large lot" residential zones elsewhere in the district.
7.36 (vi) Addition to this rule to provide that no residential lots in the [RRA(14)] sub zone shall have direct access to Dunstan Road & Waldron Road.	This rule is required to preserve the safety and efficiency of Dunstan Road, a rural arterial road, by reducing access onto Dunstan Road to a single entry point and not increasing usage of the Dunstan Road/Waldron Road intersection.

6.0 Evaluation of the Request under National Planning Instruments

6.1 National Policy Statements

The following National Policy Statements (NPS) are in effect:

- NPS on Urban Development Capacity
- NPS for Freshwater Management
- NPS for Renewal Electricity Generation
- NPS on Electricity Transmission
- NZ Coastal Policy Statement

With a population of under 6,000 Alexandra is not an "urban environment", as defined in the NES on Urban Development Capacity (2016) as "an area of land containing, or intended to contain, a concentrated settlement of 10,000 people or more and any associated business, land, irrespective of local authority and statistical boundaries".

Nevertheless the NES is of some peripheral relevance as it does reinforce Council's function under Sec 31(1) (aa) RMA91 for "*the establishment, implementation and review of objectives, policies and methods to ensure that there is sufficient development capacity in respect of housing and business land to meet the expected demands of the district*". (my underlining).

There is no other NPS relevant to this Request.

6.2 National Environmental Standards

The following National Environmental Standards (NES) are in effect:

- NES for Air Quality
- NES for Sources of Drinking Water
- NES for Telecommunication Facilities
- NES for Electricity Transmission Facilities
- NES for Assessing and Managing Contaminants in Soil to Protect Human Health
- NES for Plantation Forestry

The NES for Air Quality makes the Otago Regional Council responsible for managing air quality under the RMA91 and the Central Otago District Council responsible for issuing permits for qualifying solid fuel heaters in air sheds 1 & 2 under the Regional Plan: Air. The site is not within either air shed (1) or air shed (2).

The NES for Assessing and Managing Contaminants in Soil to Protect Human Health has been dealt with under the Preliminary & Detailed Site Assessments at **Appendix 'H'**.

In summary, there will be no risk to human health from soil contamination by subdivision and development of the site.

There is no other NES relevant to this Request.

7.0 Evaluation of the Request under Regional Planning Instruments

7.1 Regional Policy Statement 1998

The Regional Policy Statement 1998 was fully revoked as of 15 March 2021.

7.2 Partially Operative Regional Policy Statement 2019 (PRPS)

The objectives and policies of the PRPS are addressed as follows:

Objectives and Policies	Comment/Analysis
2.1 to 2.2 (Kai Tahu values and interests)	The PRPS requires that Kai Tahu values and interests are recognised and kaitiakitaka is expressed. Discovery protocols can best be put in place at the subsequent resource consent stage to develop the site. The site is not subject to any statutory acknowledgement in the Ngai Tahu Claims Settlement Act 1998. Kai Tahu ki Otago will be notified of the Plan Change and will have further opportunity to submit.
3.1 to 3.2 (Functions and values of Otago's ecosystems and natural resources)	The site does not contain any significant natural ecosystems and habitats of indigenous species, fresh water bodies or wetlands. The site is not in an area of outstanding natural features or landscapes. The site is not within land classified as landuse capability I, II and III(e) in accordance with the NZ Land Resource Inventory and does not contain a significant soil resource. Any significant use of the site for primary production cannot be realised due to the absence of a suitable source of irrigation water.
4.1 (Risk that natural hazards pose to Otago's communities are minimal)	A search of the Otago Regional Council's Natural Hazards Database shows that the site is not subject to any natural hazard. It enables increased development within a site that is not hazard prone and does not pose a risk to ecosystem values. It does not compromise the safety of the local road network. It contributes to Alexandra's resilience by providing more choice in housing options. The site is flat and not flood prone. The proposal does not increase the risk or the consequences of risk of natural hazards affecting human life, infrastructure and property.
4.3 (infrastructure managed and developed in a sustainable way)	The site will be connected to the Council water and wastewater reticulations
4.5 (urban growth and development is well designed, occurs in a strategic and co-ordinated way and integrates effectively with adjoining urban and rural environments)	The Plan Change enables development that can integrate effectively with the adjoining urban and rural environments, to ensure there is sufficient housing land development capacity. All necessary infrastructure is, or will be, in place to enable residential development of the site. The site is underlain by a considerable depth of highly permeable glacial out wash gravels which

	will facilitate direct disposal of stormwater to ground, in compliance with low impact design principles.
4.6 Hazardous substances, contaminated land and waste materials do not harm human health or the quality of the environment in Otago.	A DSI has been provided with the Request and confirms the site is suitable for residential activity. As the proposed zone is for residential purposes only, there will be no potential for storage, use or transportation of hazardous substances.

8.0 Evaluation of the Request Against the Kai Tahu ki Otago Natural Resource Management Plan (2005)

Section 3 of the Operative District Plan puts in place the framework within which issues of concern to Kai Tahu ki Otago in the context of the Act are recognised and provided for in the Central Otago District. Policy 3.4.1 of the Operative District Plan explicitly recognises the 1995 version of the Iwi Management Plan as the principal resource management reference planning document for the Central Otago District.

To the extent that the Request is simply applying an existing (residential) zoning provision to the site, the District Plan already incorporates consideration of issues of concern to Kai Tahu on any subsequent subdivision development of the site.

Alexandra is located within the Clutha-Mata-au Catchment, and this is described at Section 10.1 of the 2005 Management Plan as:

"The Clutha/mata-au Catchment centres on the Clutha/Mata-au River and includes all sub catchments within this main Catchment.

Wai Maori Issues:
Land Use:

- *Lack of reticulated community sewerage schemes.*
- *Existing sewage schemes are not effectively treating the waste and do not have the capacity to cope with the expanding population.*
- *Land use intensification, for example dairying in the Poumahaka Catchment.*
- *Increase in the lifestyle farm units is increasing the demand for water.*
- *Sedimentation of waterways from urban development.*

Policies:

Land use:

9. To encourage the adoption of sound environmental practices, adopted where land use intensification occurs.
10. To promote sustainable land use in the Clutha-Mata-au Catchment.
11. To encourage all consents related to subdivision and lifestyle blocks are applied for at the same time including, land use consents, water consents, and discharge consents.
12. To require reticulated community sewerage schemes that have the capacity to accommodate future population growth.

10.3 WAHI TAPU

10.3.1 Wahi Tapu in the Clutha/mata-au Catchments

There are a range of wāhi tapu, but physical resources such as mountain tops, springs and vegetation remnants are other examples. Urupā and some significant sites of conflict are located all along the Clutha Mata-au River.

10.3.3 Wāhi Tapu Policies in the Clutha/Mata-au Catchment

1. *To require that wāhi tapu sites are protected from further loss or destruction*
2. *To require accidental discovery protocols for any earth disturbance activities.*

The Mata-au/Clutha River is also an area of statutory acknowledgement in schedule 11 RMA91 (Ngai Tahu claim Settlement Act 1998).
The site will connect to reticulated wastewater and water services that have the capacity to accommodate the growth. All stormwater will be disposed of direct to ground within the confines of the site and the site is not adjacent to the Mata-Au/Clutha River. No water take consents will be required to subdivide and develop the site. There is no known waahi tapu associated with the site. An accidental discovery protocol can be imposed by resource consent conditions.
The Request therefore accords with the issues, objectives and policies of the Management Plan.

9.0 Evaluation of the Request Against the Otago Southland Regional Land Transport Plan

The Request fully complies with the long-term strategic objectives of the Plan in that:

- Alternative transport modes are available by the Rail Trail (cycling and walking) within 1km of the Alexandra township (the Plan provides that 10km for cycling and walking and 2km for walking is considered to be the normal limit for these transport methods).
- A suitable intersection onto Dunstan Road will provide for reliable, resilient and safe access to the network. Section (8.2) of the Transport Assessment in **Appendix G** also concludes that the Request complies with the Regional Land Transportation Plan.

10.0 Evaluation Against the Vincent Spatial Plan (VSP)

The VSP is not a statutory instrument and can therefore have limited application to the consideration of this Request. Nevertheless, it does indicate the strategic direction to accommodate growth in the Clyde Alexandra area envisaged by Council and the community.

Options (1) & (2) of the VSP released in December 2020 identify Dunstan Road as suitable for low density large lot residential development, therefore the Request is compatible with these options.

11.0 Conclusion

The above evaluation has assessed the Request under Section 32 of the Resource Management Act 1991. The conclusions from this evaluation can be summarised as follows:

- The objectives of the Request are necessary and are an appropriate way to achieve the purpose of the Resource Management Act.
- The Request complies with and gives effect to the objectives and policies of the District Plan and higher order planning instruments.
- The provisions of the Request will be efficient and effective in achieving the objectives of the Request, taking into account their costs and benefits.

- There is no risk of the activity, given that the provisions of the Request manage the effects of the activity or the wider environment and there is no uncertainty in or in sufficiency of information about these provisions. There is a risk of not acting because the land and infrastructure resource could be lost to inefficient land uses.

Appendix 'F'

Market/Economics

William Hill Private Plan Change, Alexandra

Economic Assessment

30th March 2021 – Final

m.e consulting

William Hill Private Plan Change, Alexandra

Economic Assessment

Prepared for

Molyneux Lifestyle Village Limited

Document reference: MLVL001.21/Report/Economic Assessment Report FINAL.docs

Date of this version: 30th March 2021

Report author: Natalie Hampson

Director approval: Natalie Hampson

www.me.co.nz

Contents

Figures

1 Introduction

This report by Market Economics ("M.E") provides a desktop assessment of future housing demand and capacity in Alexandra in Central Otago District ("COD"). This assessment provides the relevant context against which the economic cost and benefits of a proposed private plan change request by Molyneux Lifestyle Village Limited ("MLVL") can be considered. This report is intended to contribute to the requestor's section 32 evaluation.

1.1 Site Location and Operative Zoning

MLVL are owners of approximately 16.5ha of land currently zoned Rural Resource Area – Rural Residential Notation ("Rural Residential zone") in the operative COD District Plan[1]. The site is referred to as "William Hill" and is located on the corner of Waldron Road and Dunstan Road, approximately 1km north of the current Alexandra town boundary (being the edge of the nearest Residential Resource Area zone for the purpose of this report, rather than an officially defined planning boundary).

Adjoining land uses of the site include rural lifestyle properties, productive rural activities, the Alexandra Golf Course (on the western side of Dunstan Road) and the Central Otago Rail Trail (located between the western side of Dunstan Road and the Golf Course). The site is not actively utilised for primary production although was once the William Hill vineyard, and it contains some existing buildings that includetwo dwellings and a working winery which are to be retained.

Under operative zoning, M.E understands that the site could be subdivided into 8 rural residential lots (average minimum lot size of 2ha) as a controlled activity. Currently, the site is made up of 4 lots/titles.

1.2 Proposed Zoning

The concept MLVL wishes to pursue is to provide the Alexandra community with a similar provision to the "large lot" residential zones that the District Plan provides for in other parts of the district, but particularly within the Cromwell Ward. For the purposes of this report, M.E considers large lot residential density to span lots greater than or equal to 1,500sqm[2] and less than a hectare. Appendix A provides a summary of Residential Resource Area ("RRA") and Rural Resource Area ("RuRA") zones in the District Plan. Zones that M.E consider supply a low density or large lot residential development form include (in ascending minimum lot size areas); RRA8, RRA4, RRA1, RRA5, RRA6, RRA2, RRA9, and selected sites within RuRA3.

Of these zones, only the RRA9 (Bridge Hill, minimum lot size of 6,000sqm) and RuRA3 (Conroy's Road, a few select lots with a minimum of 1,500sqm) can be found in the rural fringe of Alexandra. Both provide very limited capacity for large lot residential living near Alexandra. The RRA3 zone is also in the urban fringe of Alexandra and provides for a minimum lot size of 1,000sqm and so while M.E considers that a zone which supplies 'residential' properties, it could have supplied large lot residential properties *if* the landowner was

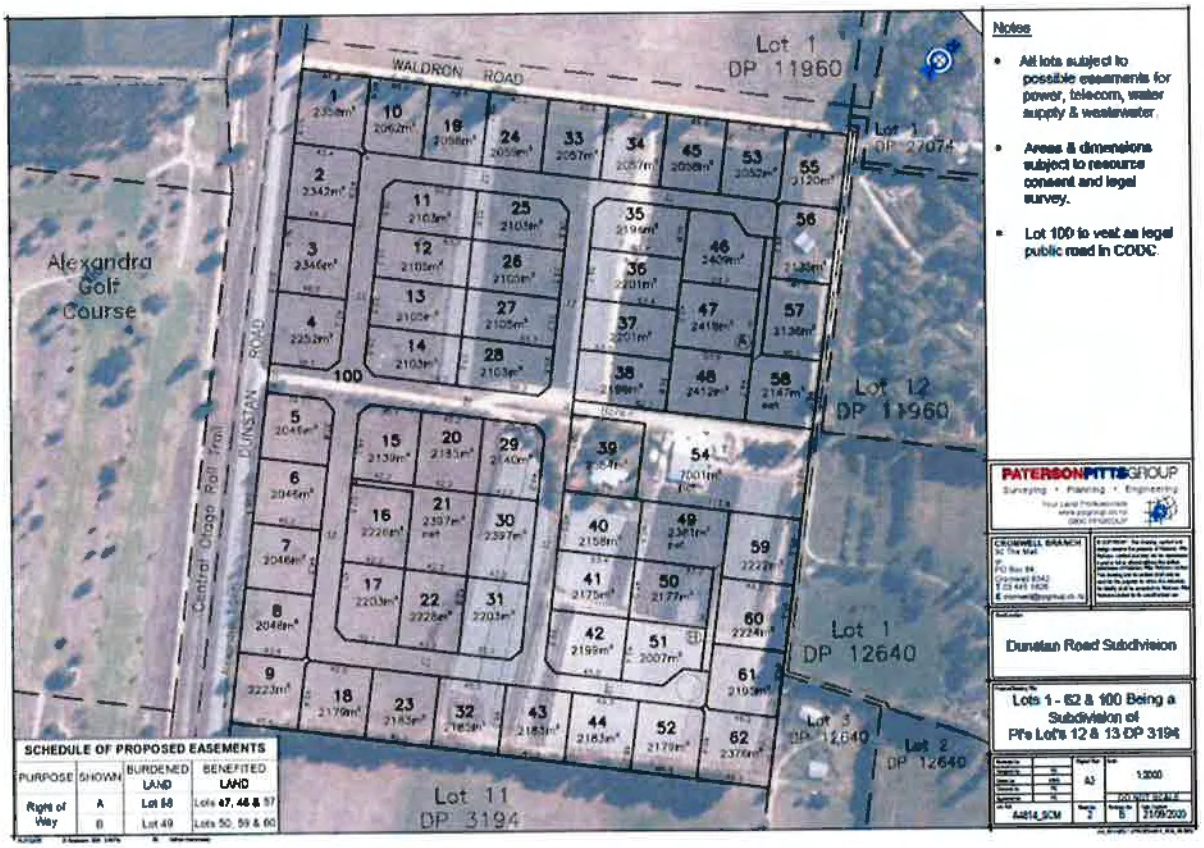
[1] A portion of the site is also subject to the Airport Protection Zone notation.

[2] Based on minimum or average lot size.

minded to supply lots well above the minimum. Based on parcel data sourced by M.E, this small spot zone has delivered 30 lots, most of which are just above the threshold of the minimum lot size, with one larger parcel around 1,300sqm – making this zone distinctly residential rather than large lot residential.

The proposed yield of the William Hill site would be around 60 large lot residential sections with lot sizes of around 2,000-2,200sqm according to the site plan provided by MLVL (Figure 1.1). This is a large lot residential density not otherwise provided in Alexandra but is similar to the RRA4 zone provided in Bannockburn where lots must have an average size of 2,000sqm.

Figure 1.1 – Indicative Site Plan Showing Density and Lot Yield – William Hill



1.3 Report Objectives and Structure

The objective of this report is to focus on housing demand, supply and capacity in the area that includes the urban township of Alexandra and its urban/rural fringe. This combined extent covers the housing market of Alexandra (being those households that want to live in or near the township).

M.E has focused on recent growth trends from a Census data and land subdivision perspective (Section 2). The spatial analysis of land parcels created over time provides helpful context on the way that land development has occurred in response to demand and the parameters of the District Plan and provides insight on potential supply constraints. Understanding recent trends is key to estimating future housing supply patterns, particularly what is reasonably expected to be realised in land development in the short-

medium terms under a business as usual outlook (given that housing preferences tend to be slow to change).

Section 3 of this report examines a selection of housing market indicators and how these have changed over time and where Alexandra is today. These indicators are useful to help frame the problem statement against which the proposed plan change can or cannot offer a degree of solution in Alexandra's housing market.

Section 4 looks to the future, with an analysis of future dwelling demand in and around Alexandra based on available data. This provides the context against which the sufficiency of estimated plan enabled capacity[3] can be assessed in both the urban and rural/rural lifestyle zoning context. M.E then provides brief commentary on the proposed Vincent Spatial Plan growth options – reflecting on how effective they may be in addressing the housing market issues identified throughout this report. Section 5 draws conclusions on anticipated costs and benefits of the proposed private plan change in William Hill in light of the evidence base collated by M.E, including the degree to which it supports (or otherwise) the strategic planning options identified in the proposed Vincent Spatial Plan.

[3] A detailed assessment of plan enabled and commercially feasible urban dwelling capacity within Alexandra is not addressed in the scope of this report. This report also does not touch on infrastructure constraints to future housing development.

2 Housing Growth & Supply in Alexandra

This section examines recent changes in private occupied dwelling counts taken from Census data for Alexandra and the district overall. It highlights where growth has been occurring and Alexandra's changing role in the resident household market. This is followed by a brief overview of operative zoning in Alexandra and a detailed spatial analysis of LINZ[4] land parcel data in the Vincent Community Board Area. The spatial analysis includes a current snapshot of parcel size patterns and a temporal analysis of Alexandra's growth and supply patterns.

2.1 Recent Occupied Dwelling Growth

Figure 2.1 summarises Census statistics on private occupied dwellings in COD based on Statistical Area 2 (SA2) boundaries (Appendix B). The combined area of Alexandra North and Alexandra South SA2s include the current development footprint of the township, as well as land immediately fringing the town, including the Alexandra Golf Course, although not the proposed plan change site. It therefore includes a mix of urban zones, large lot residential zones (to the limited extent that they are provided), Rural Residential zoning and RuRA zoning. The occupied dwelling data relates closely to resident households. The data is not a complete picture of residential dwellings as it excludes usually unoccupied dwellings such as holiday homes.

Relevant findings from Figure 2.1 include:

- Alexandra grew by 348 private occupied dwellings between 2013 and 2018. This is an average annual growth rate (demand) of 47 resident households per year.
- In 2006, Alexandra accounted for 29.3% of total occupied dwellings in the district and in 2018, this reduced to a 26.5% share.
- This is driven by a below average growth rate of 17% between 2006 and 2018, compared to 30% for the district as a whole, and 47% in Cromwell and 115% in the Lindis-Nevis Valley (which includes satellite urban/large lot residential areas and Rural Residential zone areas close to the Cromwell urban area).
- In the rural area surrounding Alexandra, the area to the north and east and excluding Clyde (Dunstan-Galloway SA2) grew by an above average of 36% between 2006 and 2018. While this area makes up 7.0% of total district occupied dwellings in 2018, it accounted for 8.0% of the district growth since 2006 (i.e. is punching slightly above its weight). Conversely, Alexandra makes up 26.5% of total district occupied dwellings in 2018 but accounted for just 17.2% of district growth since 2006 (punching below its weight).

[4] Land Information New Zealand.

- For every 13 private occupied dwelling added in the areas defined as Alexandra between 2013 and 2018, there were 6 added in Dunstan-Galloway. For every 11 private occupied dwelling added in Alexandra between 2013 and 2018, there was 1 added in the rural Earnscleugh SA2.

Figure 2.1 – Private Occupied Dwellings by SA2 in Central Otago District 2006-2018 Census

SA2 (including grouped)	Private Occupied Dwellings (n)			Share of District Total (%)			Growth in Occupied Dwellings (n)			Growth in Occupied Dwellings (%)		
	2006	2013	2018	2006	2013	2018	2006-2013	2013-2018	2006-2018	2006-2013	2013-2018	2006-2018
Alexandra North and South	**2,001**	**2,115**	**2,349**	**29.3%**	**28.1%**	**26.5%**	**114**	**234**	**348**	**6%**	**11%**	**17%**
Clyde	**396**	**438**	**540**	**5.8%**	**5.8%**	**6.1%**	**42**	**102**	**144**	**11%**	**23%**	**36%**
Dunstan-Galloway	**456**	**510**	**618**	**6.7%**	**6.8%**	**7.0%**	**54**	**108**	**162**	**12%**	**21%**	**36%**
Earnscleugh	**225**	**240**	**261**	**3.3%**	**3.2%**	**2.9%**	**15**	**21**	**36**	**7%**	**9%**	**16%**
Cromwell East and West	**1,461**	**1,752**	**2,142**	**21.4%**	**23.2%**	**24.2%**	**291**	**390**	**681**	**20%**	**22%**	**47%**
Lindis-Nevis Valleys	**474**	**711**	**1,020**	**6.9%**	**9.4%**	**11.5%**	**237**	**309**	**546**	**50%**	**43%**	**115%**
Maniototo	**693**	**678**	**720**	**10.1%**	**9.0%**	**8.1%**	**-15**	**42**	**27**	**-2%**	**6%**	**4%**
Manuherikia-Ida Valleys	**414**	**417**	**447**	**6.1%**	**5.5%**	**5.1%**	**3**	**30**	**33**	**1%**	**7%**	**8%**
Teviot Valley	**708**	**678**	**753**	**10.4%**	**9.0%**	**8.5%**	**-30**	**75**	**45**	**-4%**	**11%**	**6%**
Total Central Otago District	6,828	7,539	8,850	100.0%	100.0%	100.0%	711	1,311	2,022	10%	17%	30%

Source: Statistics New Zealand.

Figure 2.1 indicates that Alexandra is unlikely to retain its position as the largest concentration of occupied private dwellings in the district in the near future unless considerable capacity for growth is provided and it can attract a greater share of growth than it has done in recent years. It also shows that strong growth is occurring in the rural areas surrounding Alexandra - a trend not dissimilar to what has been occurring around Cromwell.

This data does not identify the cause of that trend, including whether it is driven by a lack of readily available housing capacity or supply in the urban area, or simply demand for larger property sizes, or both. Unlike in Cromwell, we know that it is not driven by the provision of zoning of urban residential and large lot residential density housing in satellite areas of the rural fringe[5] as this is not provided for in the District Plan around Alexandra in any material way, as discussed in Section 1.2 above. This demonstrates that the dwelling growth taking place in the rural surrounds of Alexandra is not occurring in an efficient manner (in terms of consumption of the rural land resource), rather is resulting in continued low intensity fragmentation of rural land close to Alexandra, as enable under the RuRA and Rural Residential zones. This pattern of land supply is discussed further below.

2.2 Subdivision Supply Patterns

M.E has sourced current land parcel boundaries as at February 2021 from LINZ in map (GIS[6]) format. In order to include 'date of title issue' information, the parcel data is not limited to primary parcels and therefore includes overlapping parcels where they are registered (including for easements, cross leases, leases and other reasons) to more than one owner. To help remove (as far as practical) the overlap, M.E has cleaned the data using a range of techniques. We have also excluded some parcel types (such as

[5] A lot of the growth occurring in the Lindis-Nevis Valleys is attributed to zoned development areas in Pisa Moorings, Lowburn and Bannockburn, including subdivisions such as Queensberry.

[6] Geographic Information Systems software.

legislated or crown land) to help focus the data on developable land areas. A consequence of this is that there are a small number of gaps in the data, and this is evident in the maps produced (particularly on the river margins).

Where parcels are cross leases, we have calculated the implied average lot area of each dwelling so as not to under-represent this higher density development. We have also tagged parcels to operative District Plan Zones – although this is approximate (and subject to minor errors) in some locations where zone boundaries do not follow parcel boundaries. The zone coding is considered broadly representative of the District Plan zoning and suitable for the purposes of this report but is not an exact replication of District Planning maps. The following sub-sections summarise four key outputs of the analysis of land parcels in and around Alexandra that are relevant to the context of the proposed plan change.

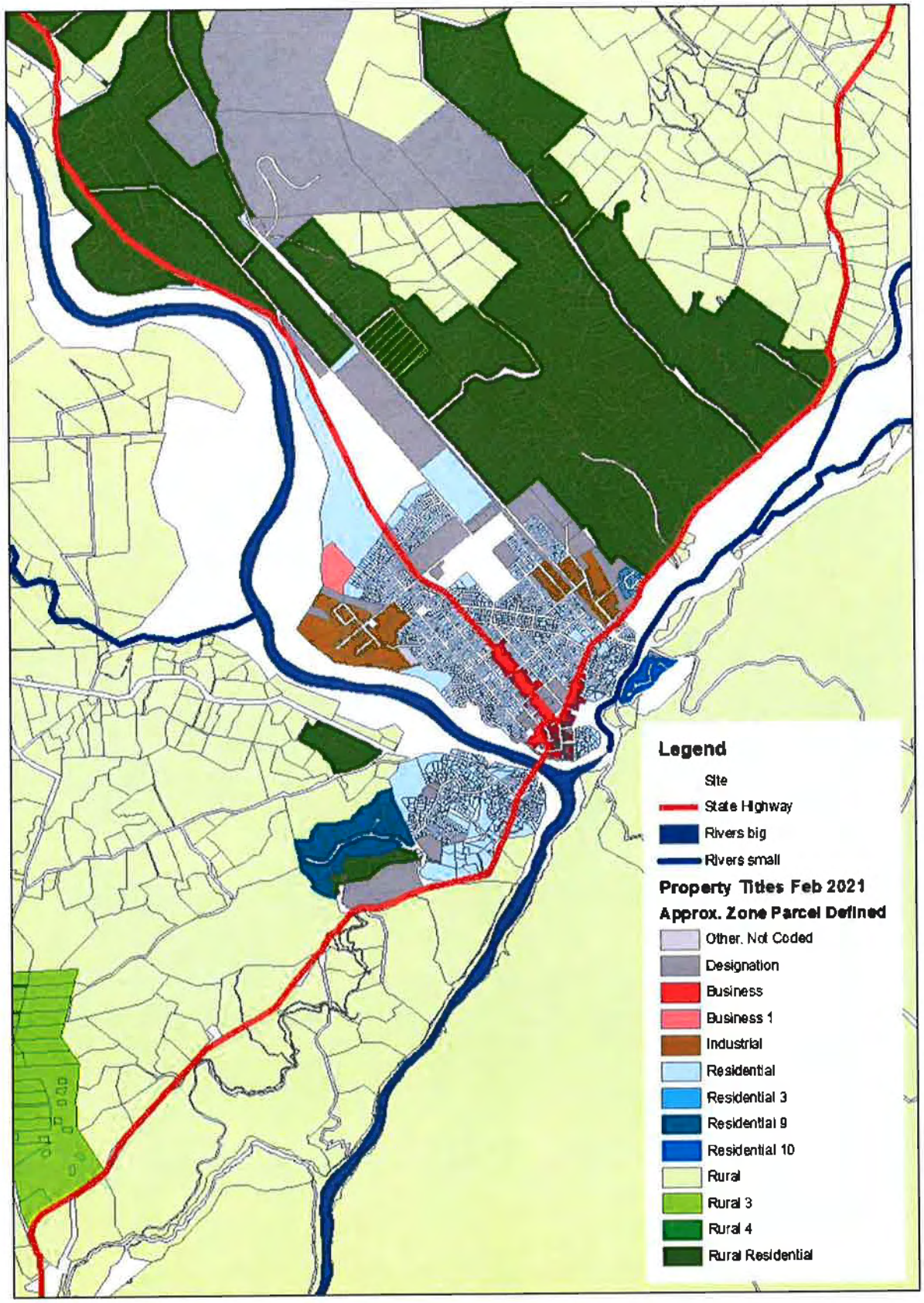
2.2.1 Zoning Patterns

Figure 2.2 shows the general land use zoning pattern in and around Alexandra. Key observations are:

- Alexandra township is highly constrained by natural barriers, particularly the Clutha and Manuherekia Rivers. Urban growth has however been enabled 'across' the rivers in the RRA 10 zone and in Bridge Hill to the south.
- At a high level, the greatest potential for cohesive urban expansion is away from the rivers: to the north (including east of the Dunstan Road axis) and to the south west (Bridge Hill), other development constraints notwithstanding[7].
- The dominance of the RRA zone is clear and there is limited alternative residential or large lot residential density zones provided in Alexandra.
- The RRA 3 zone is small in scale and makes up a very small share of residential capacity on the fringes of the RRA zone.
- The RRA 10 zone is small in scale and makes up a very small share of residential and large lot residential capacity on the fringes of the RRA.
- The RRA 9 zone is larger in extent and enables large lot residential (at the higher end of the size range) on the fringe of the RRA zone in Bridge Hill.
- The area of Rural Residential zone to the north is extensive and immediately abuts the urban township. While this provides a transition to the RuRA zone further to the north, it provides a stark transition from the RRA zone or RRA 3 zone.
- Overall, Alexandra has a well-defined/strong urban edge from a zoning perspective which is advantageous in containing/constraining urban sprawl provided it contains sufficient commercially feasible and reasonably expected to be realised capacity for long term growth.

[7] Includes ONLs, SNAs, amenity areas, protected areas, land ownership, slope, landscape effects etc.

Figure 2.2 - Current Land Use Zoning Patterns in the Wider Alexandra Area



- However, a disadvantage of the current zoning pattern is that it does not enable much variation in property types available to the market. At the moment, there is mainly residential or rural lifestyle, with very little (large lot residential) in between[8].

- A likely market response to a lack of zoning for low density or large lot residential zoning is that:

    - The market/landowners supply it in the RRA zone despite being able to develop the land to higher intensities. This is not the most efficient use of land zoned for intensive residential development close to the town centre and reduces the capacity of the RRA zone to provide for urban growth.

    - This segment of demand compromises on preferred section size and opts for a smaller residential property.

    - This segment of demand opts for the next size up (Rural Residential zone) but may be less likely to use the land productively as this was not the primary purpose of purchasing in the zone.

    - This segment of demand chooses not to live in/near Alexandra and looks elsewhere where large lot residential living options are provided.

2.2.2 Lot Size Patterns

Figure 2.3 shows the general land parcel size patterns in and around Alexandra (refer Appendix C for a closer view of the township). M.E has blocked out the business and industrial zone area (where able to be identified using parcel boundaries), as well as designation sites, to focus the patterns on zones that enable dwellings. Figure 2.4 shows a summary of the equivalent data – split according to parcels in the extent of the two SA2s that make up the township and immediate surrounds (Appendix B), and total parcels in the Vincent Community Board – which includes the rural/rural lifestyle land near Alexandra but outside the town SA2s (including the proposed plan change site), but also other urban and rural areas such as Clyde and rural settlements within Vincent.

Key observations are:

- The effect of the zoning in and around Alexandra (discussed above) is evident in the lot sizes created through subdivision. The urban area has a very clear edge where residential lots generally adjoin much larger rural lifestyle properties.

- The RRA zone[9] has resulted in the supply of a range of residential parcel sizes, with most in the main (central) urban area (township) between 600-800sqm each (parcels this size make up 36% of residential parcels in the town area, Figure 2.4). There is also a substantial number of smaller residential lots in this area, including lots down to 250sqm as enabled by the zone.

[8] M.E acknowledge that prescribing minimum lots sizes in many zones means that landowners have the ability to supply a variety of land parcel sizes above that minimum (and where an average lot size is not also imposed). This can create variation where landowners are not motivated to maximise yields.

[9] Including the legacy effect of previous planning regimes.

Figure 2.3 - Current Residential Land Supply Patterns – Parcel Sizes in the Wider Alexandra Area

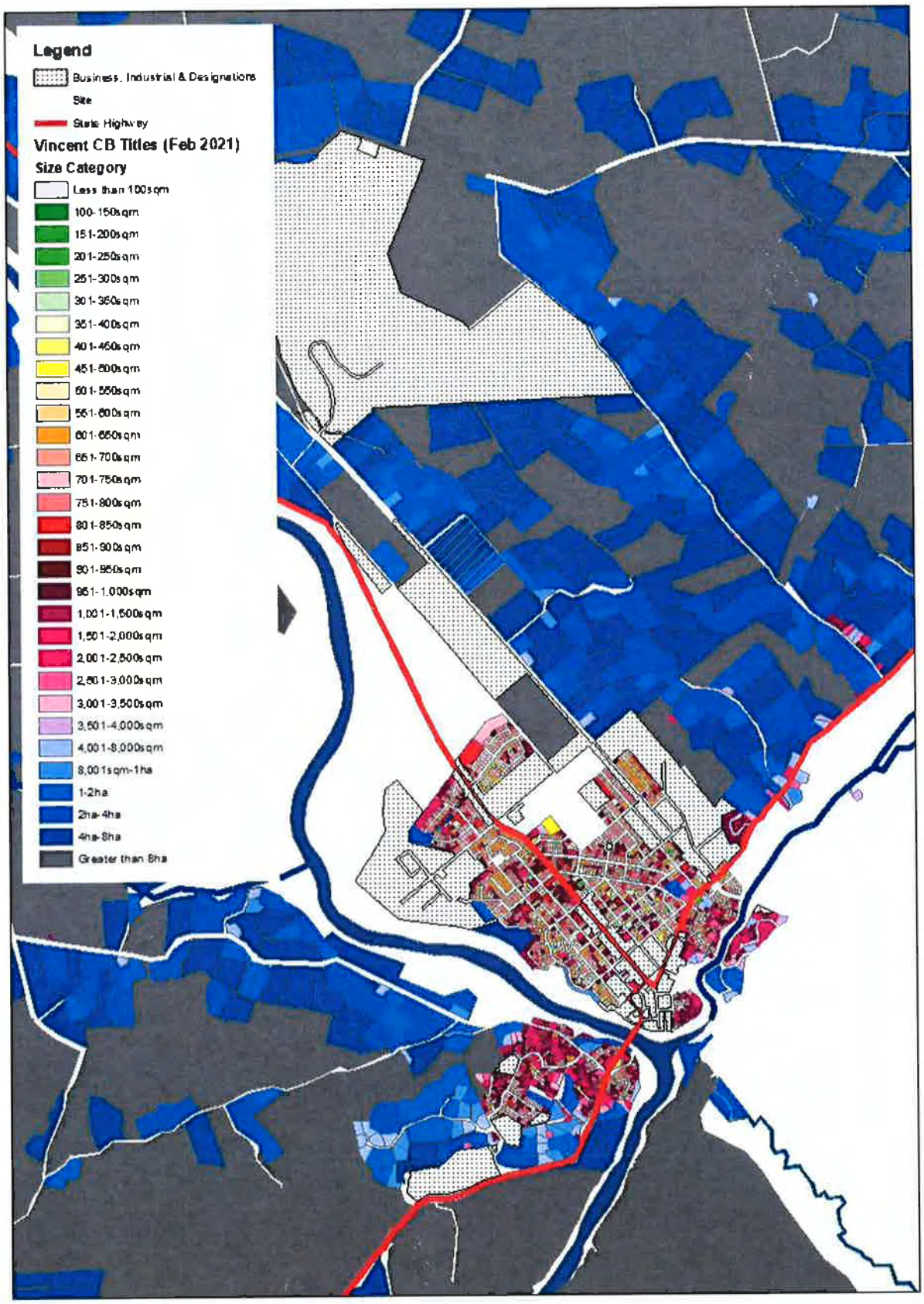
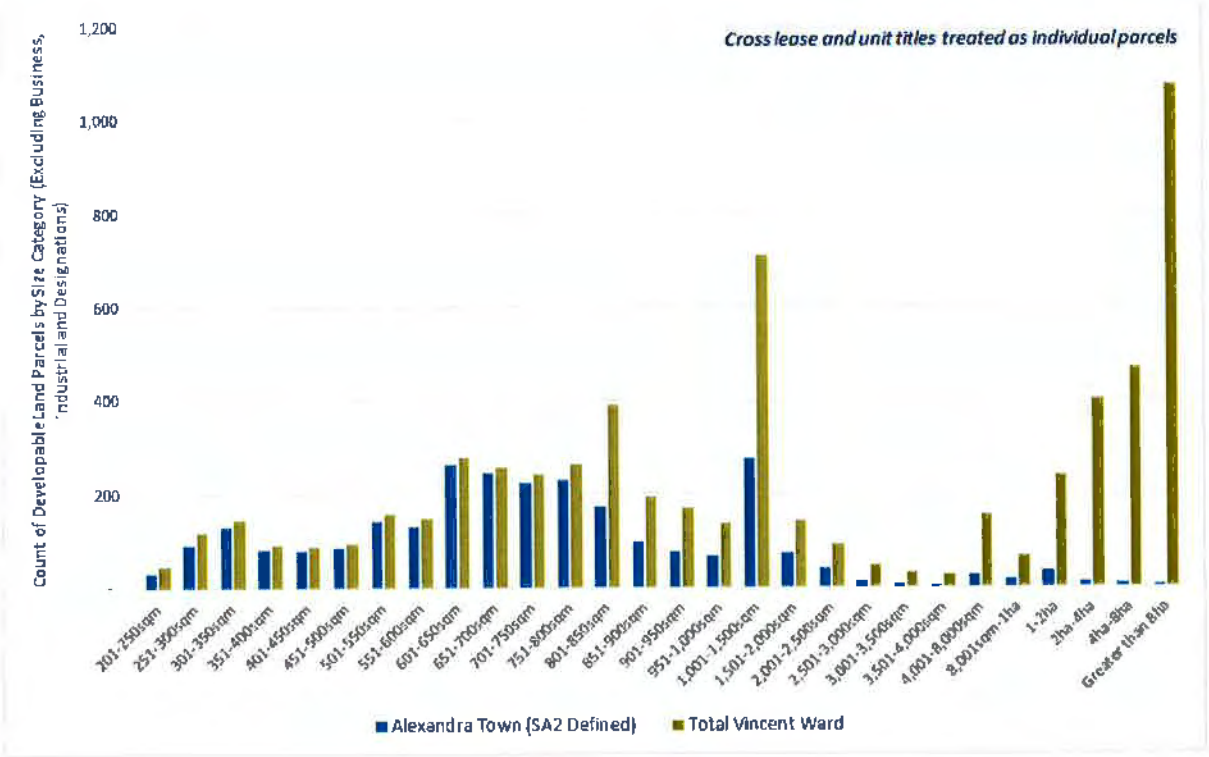


Figure 2.4 – Distribution of Current Residential Land Supply – Parcel Sizes in Alexandra & Vincent Ward



- The supply of large lot residential properties in fringe areas of Alexandra is apparent despite only limited targeted provision for it in the District Plan zoning:
    - Parcels sized between 1,500sqm-1ha make up 6.7% of residential parcels in the township, and 8.8% of residential parcels in the total Vincent Ward (Figure 2.4).
    - The Bridge Hill area, despite enabling a density of housing down to 250sqm per dwelling in the RRA zone has largely delivered residential lots at the upper end of the size range as well as large lot residential properties. This area is highly constrained for development because of steep slopes and other features.
    - Similarly, the RRA 10 zone (Shaky Bridge) has (in accordance with the concept plan) also delivered large lot residential despite a stated minimum lot size of 800sqm.
    - About half the lots in the RRA 9 zone (Bridge Hill) delivered large lot residential properties, with the other half delivering rural lifestyle properties (i.e. those larger than 1ha).
- A small number of large lot residential properties are scattered throughout the Rural Residential zone where the 2ha average lot size requirement can be met.

2.2.3 Title Date Patterns (Growth Location)

Figure 2.5 shows the general land parcel date patterns in and around Alexandra – that is the date when the parcel title was issued by LINZ (generally a period of time after subdivision consent has been issued). Refer

Appendix D for a closer view of the township. M.E has blocked out the business and industrial zone area, as well as designation sites, to focus the patterns on zones that enable dwellings. Figure 2.6 shows a summary of the equivalent data – again split according to parcels in the extent of the two SA2s that make up the township and immediate surrounds (Appendix B), and total parcels in the Vincent Community Board – which includes the rural/rural lifestyle land near Alexandra but outside the town SA2s (including the site), but also other urban and rural areas such as Clyde and rural settlements within Vincent.

Key observations are:

- While large areas of the township are old (titles unchanged since issued in the 1990s, or even 1960s or older), intensification of some older lots has occurred sporadically and at a relatively slow annual rate. Going forward, intensification (which has been enabled for the duration of the operative District Plan) should not be relied on to cater for anything but a minor share of dwelling growth in M.E's view if past trends continue. This reflects the often low level of commercial feasibility for this type of development.

- Only 26% of current residential titles in the township SA2s were created/modified since and including the year 2000 (707 out of an estimated 2,675 qualifying parcels[10]).

- Just 7.5% were created/modified since and including the year 2015 (201 parcels out of 2,675). By comparison, 12.1% of current parcels in the rest of the Vincent Ward (i.e. excluding the Alexandra township SA2s) were created/modified since and including the year 2015 (445 parcels out of an estimated 3,687 qualifying parcels). While not all titles yield a new dwelling, this is the general presumption enabled by the Plan. This further confirms that more growth (and subdivision) activity is focussed on land outside of Alexandra township and in the rest of the Vincent Ward, which includes rural/rural lifestyle areas near to Alexandra. This is highlighted by the considerable subdivision activity occurring in recent years in the rural/rural lifestyle areas surrounding Alexandra in Figure 2.5. The rural areas are experiencing considerable change and fragmentation.

- Most recent residential growth of the township has occurred in greenfield sites rather than through intensification, with stages of development clearly visible in Figure 2.5 (i.e. Molyneux Estate and the Pines).

- The largest single year of supply growth was in 2005 when an estimated 145 residential titles were issued in the Alexandra township area. This is also the largest single year of supply growth across the total Vincent Community Board area (Figure 2.6).

- Since 2005, the next biggest year of supply growth in the town area was 2007 (57 new residential titles), then 2015 (55 new residential titles) and 2017 (49 new titles). All of these increases are linked to greenfield developments on the north east or north west urban fringe of Alexandra. In other years, supply has been almost non-existent (as low as 6 or 8 residential lots created per annum). In those years of very limited supply growth[11], between 40 and 50 new titles were issued per annum outside of the Alexandra township (in the rest of Vincent Community Board) showing that there was not an absence of demand in those years.

[10] Parcels excluding those in a business or industrial zone or in a designation site.

[11] 2010, 2013 and 2014.

Figure 2.5 - Residential Land Supply Patterns – Parcel Title Issue Year in the Wider Alexandra Area

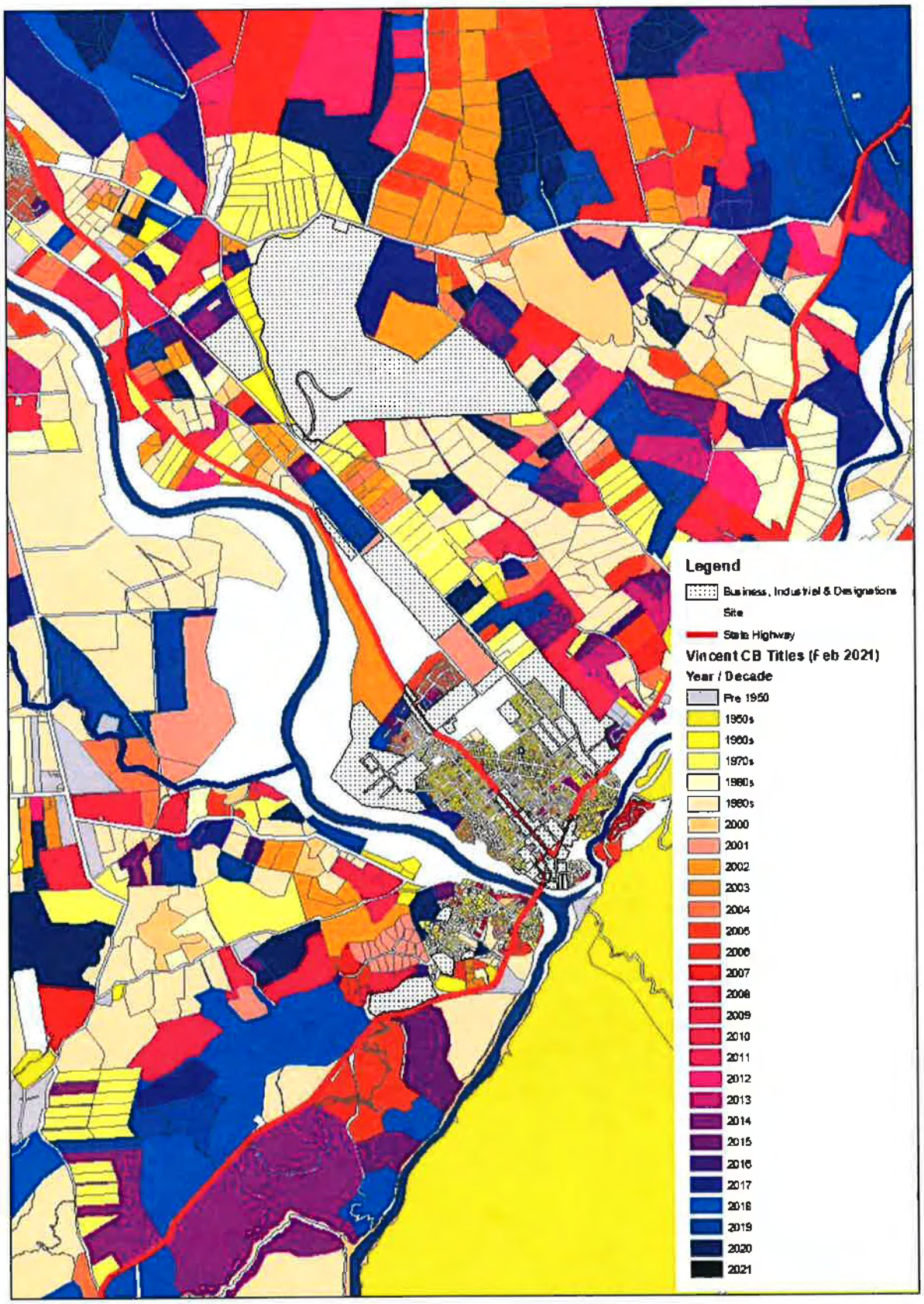
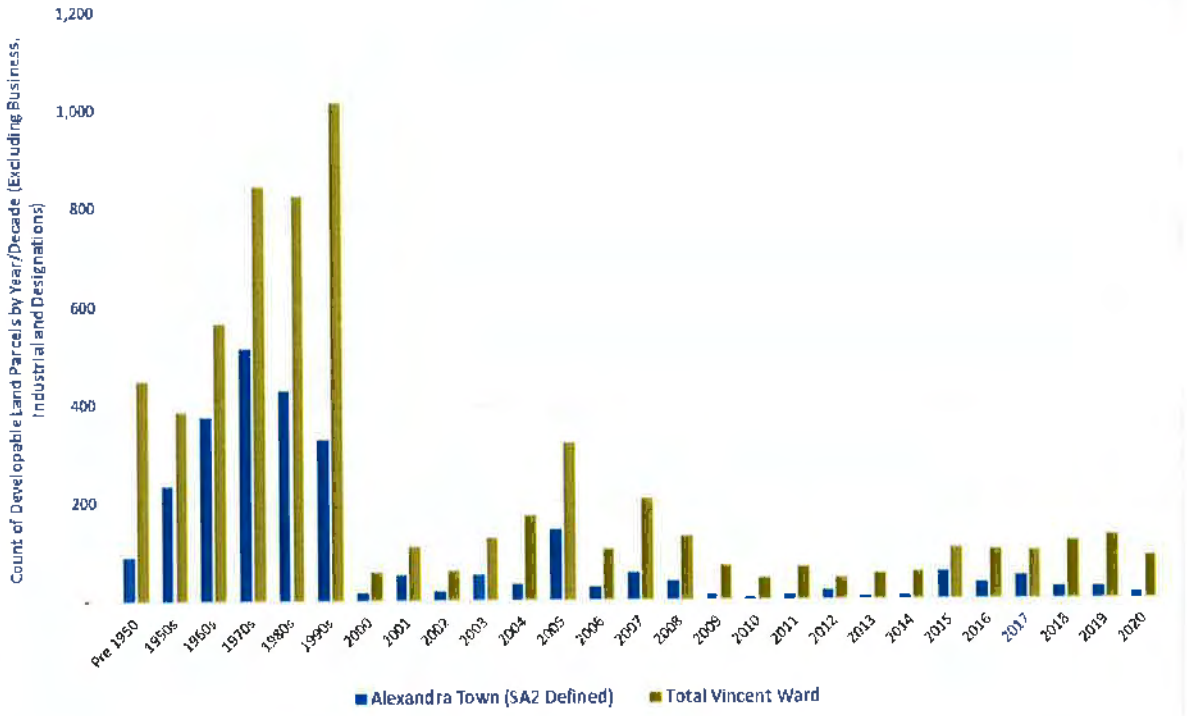


Figure 2.6 – Distribution of Current Residential Land Supply – Title Issue Date in Alexandra & Vincent Ward



- Supply of new residential titles in the Alexandra township has been steadily declining since 2017 (with just 14 titles issued in 2020). Growth is once again coming to a standstill in the absence of greenfield development, although we understand that a 60 lot (joint venture) subdivision has been recently consented adjacent to Molyneux Estate). By comparison, new titles issued in the rest of the Vincent Community Board (outside Alexandra town area) increased strongly between 2017 and 2019 (from 50 per annum to 105 per annum) although dropped slightly to 73 titles issued in 2020.

2.2.4 Title Date and Lot Size Trends

M.E has looked at the relationship between title size and date of issue trends to help understand where and when growth has occurred in qualifying land parcels. Matrices for the Alexandra town SA2 area and the total Vincent Community Board area are included in Appendix E. When applied in other districts or sub-district catchment, this same analysis has often shown very clear trends towards smaller section sizes over time in urban areas in response to both changing planning rules and market demand/supply preferences towards relatively higher residential densities[12]. That trend is somewhat evident in the Alexandra town SA2 area[13], but clear trends are hindered by the general lack of supply in many years within which changing preferences might be revealed. The samples in any one year are very small which limits the reliability of the distributions over time.

[12] M.E most recently carried out this analysis for Rotorua Lakes Council residential zones where it showed that the more recent the supply growth, the more it delivered smaller section sizes despite constant planning rules.

[13] Readers should focus on the darker green cells as they move down the table.

Notwithstanding these limitations, the data shows that there is limited variation in supply patterns in the township over the past 10 years, although in years when there has not been greenfield sections released, the mix of titles issued is weighted towards small sections as would be expected when growth is limited to infill intensification. When greenfield stages have been released, that have generally delivered a consistent range of lot sizes averaging around 750sqm.

When looking at the patterns across the total Vincent Community Board area, the key trend is the increasing share over time of rural lifestyle lots (sized 1-8ha). Of all the titles issued in the 1960's for example, just 6% fell into this size range[14]. In 2000, this increased to 28% of titles issued. In 2005 – a year of relatively more supply growth – this dropped to 10% of titles issued. In 2013, it grew to 58% of titles issued[15]. This stabilised to a still significant 25-28% of titles through the period of 2015-2018. For the last two years, it has been consistently high with 54% and 43% of all titles issued in 2019 and 2020 respectively being in the rural lifestyle size category.

This highlights that a substantial share of growth in housing supply is not directed at the urban areas of the Vincent Ward. If these trends continue, it will lead to a less and less efficient urban from, with more and more households living longer distances from urban services and more rural land being fragmented.

[14] Likely influenced by zoning rules at the time.

[15] The current District Plan was made operative in 2008.

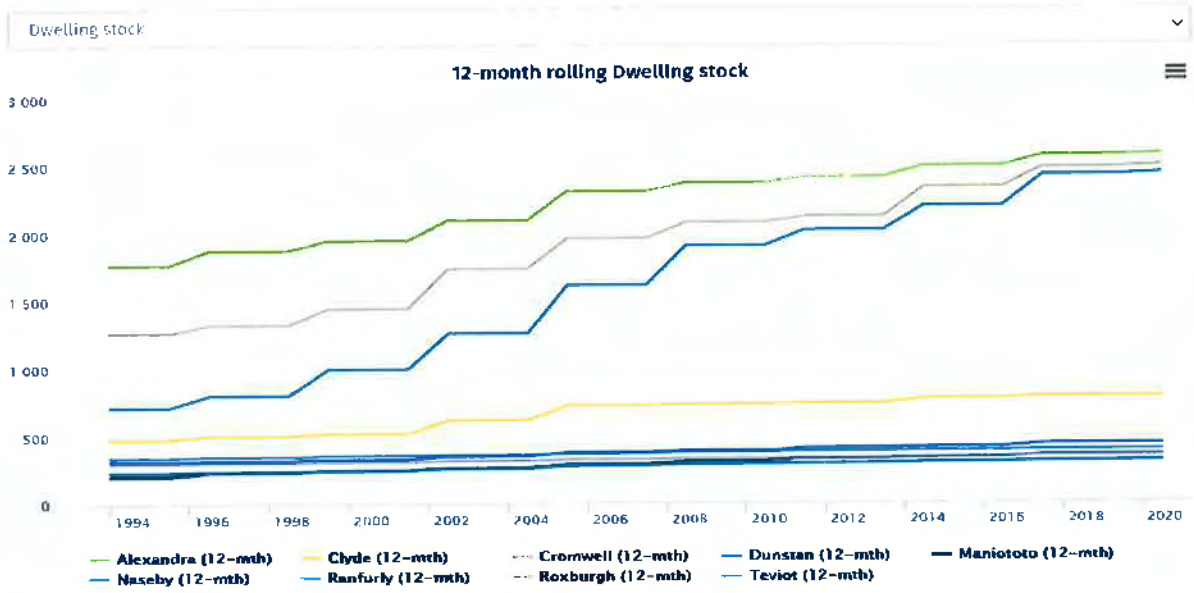
3 Current Housing Market

This section takes a brief look at selected housing market indicators for the Alexandra township. These indicators, sourced from a combination of Statistics NZ and MHUD[16], help to monitor the implications of demand, supply and capacity, and how these three factors interact in economic terms. They provide further insight on the potential relevance and effect of additional residential dwelling capacity in Alexandra, as would be enabled through the proposed private plan change.

3.1 Housing Market Indicators

Figure 3.1 contains MHUD data on the count of dwellings for each CAU of COD (Appendix F). The data (stated as being reported quarterly) is derived from building consents (lagged to allow for building completion). Alexandra is represented by the light green line in the graph. The number of dwellings in Alexandra has historically been much greater than any other CAU in the district but now is only marginally higher in dwelling count than in the Cromwell CAU and the sumi-rural/rural Dunstan CAU, which have been growing more rapidly over the last two decades. If these trends continue, the Alexandra CAU will be surpassed by both Cromwell and Dunstan CAUs in the near future. The MHUD data is consistent with Statistics NZ census data which shows that the Alexandra urban area is slowly decreasing as a share of total district dwellings and the land parcel supply patterns which shows that supply growth in Alexandra township has been increasingly limited relative to other areas (including rural surrounds).

Figure 3.1 – Central Otago District Count of Dwellings – Broken Down by CAU (MHUD)



[16] Ministry of Housing and Urban Development: Housing Market Indicators Dashboard – developed to support the NPS – Urban Development.

Figure 3.2 compares the median prices of residential dwellings sold in each quarter by CAU in COD. This median price series is not adjusted for size and quality of dwellings. Prices are presented in nominal terms; they have not been adjusted for general price inflation[17].

Sale prices are determined by the interaction of demand and supply, including for investment property as well as the type of dwelling and property size. Across COD, there was little variation in house prices back in the early 2000s, but things are very different today where there is a broad range of values depending on location. Between 2010 and 2015, Alexandra had the fourth highest median house price in the District (after Dunstan CAU which is strongly influenced by rural lifestyle properties but also satellite areas like Pisa Moorings and Bannockburn, Cromwell CAU and Clyde CAU). During this period of slow growth in dwellings in Alexandra, prices remained relatively stable. Since 2016, prices in Alexandra have accelerated rapidly (as they have elsewhere in the district) and the median now sits slightly lower relative to the top three CAUs. The median price peaked in March 2020 at $533,625, $20,000 below the district median.

Figure 3.2 – COD Dwelling Sales Prices – Broken down by CAU (MHUD)

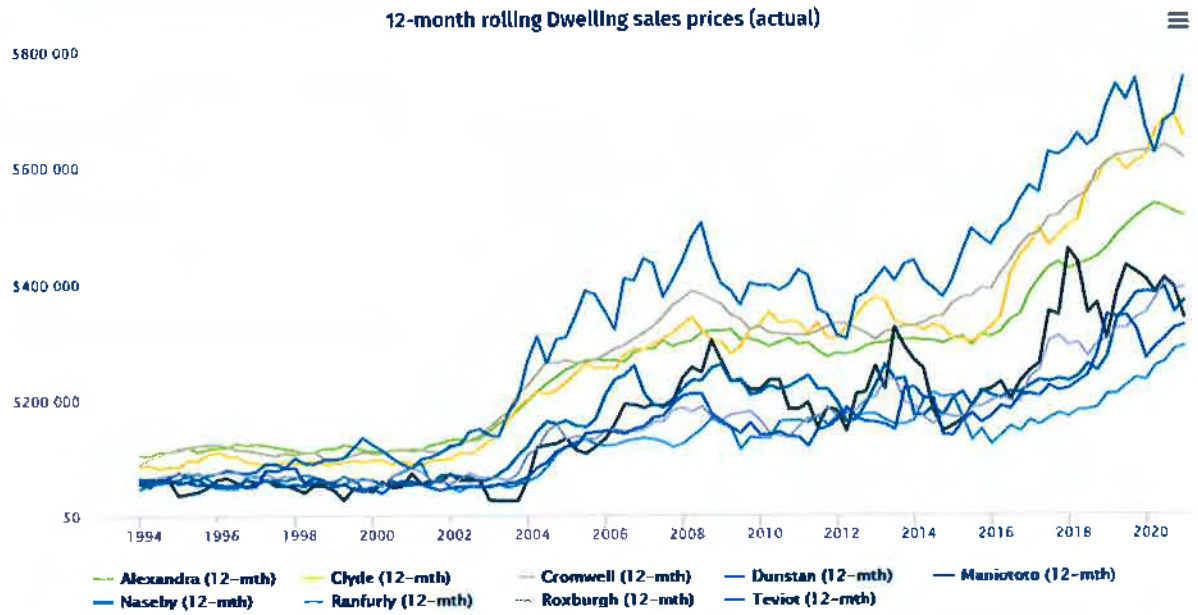


Figure 3.2 suggests a strong sellers' market in Alexandra (moderate demand and limited supply). If supply is further constrained in Alexandra township (due to the absence of the release of greenfield land or expansion potential), prices can be expected to continue to rise. This may further limit the affordability of Alexandra for certain segments of the housing market.

Figure 3.3 reflects mean[18] rents as reported in new rental bonds lodged with MBIE by CAU across COD. Prices are presented in nominal terms; they have not been adjusted for general price inflation. The data is for private bonds only and so excludes any social housing. The data shows that the rental market is primarily focussed on Cromwell, Clyde, Alexandra and Dunstan and not all CAUs in the District. At times in recent

[17] The inflation adjusted graph looks similar.

[18] The mean used is a geometric mean. The reason for using this mean is that rents cluster around round numbers and tend to plateau for months at a time (spiking up by say $10 or $20 at a time). This makes analysis of time series difficult and using the geometric mean is a way of removing this clustering effect.

years, mean rent prices in Alexandra have been very similar to those in Cromwell and Clyde, but of late, they sit slightly below. Rent prices have risen steadily since 2000 and currently (December 2020) sit on an average of $403 per week. Of interest, mean rent prices in Cromwell have stabilised and even decreased in the last two quarters (likely Covid-19 related), while rents in Alexandra continue to rise. If this trend continues, rents in Alexandra may once again match those in Cromwell or even surpass them. If the supply of rental properties is constrained in the light of continued household growth (demand), it is likely that landlords will be able to command higher and higher rents in Alexandra, further contributing to affordability issues.

Figure 3.3 – COD Dwelling Rent Prices – Broken down by CAU (MHUD)

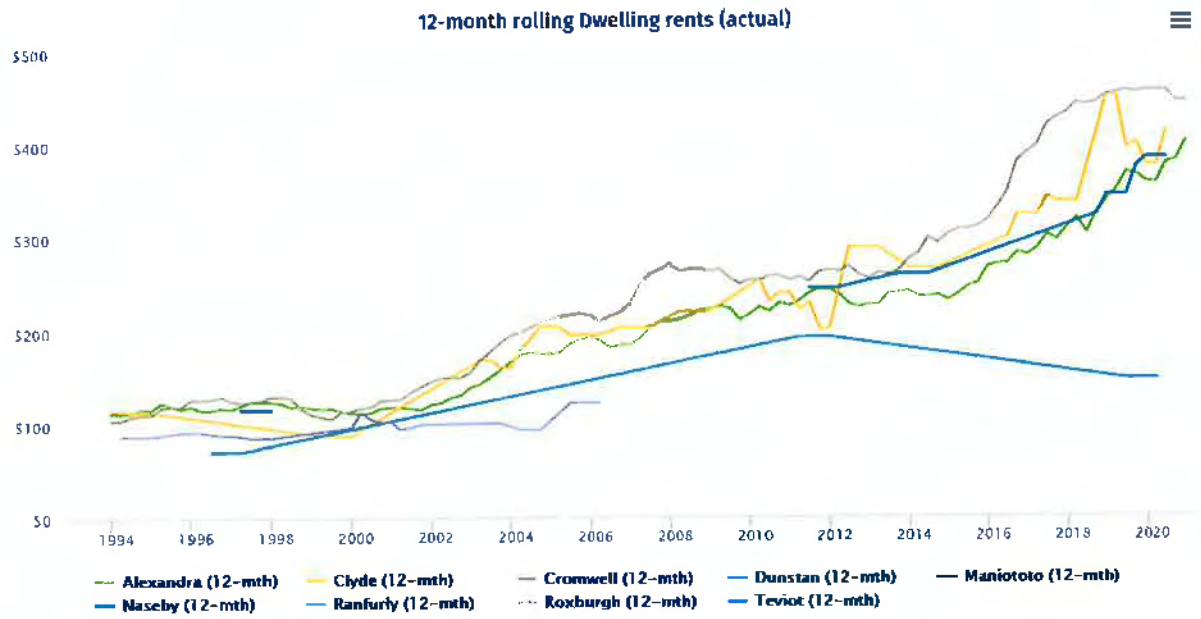
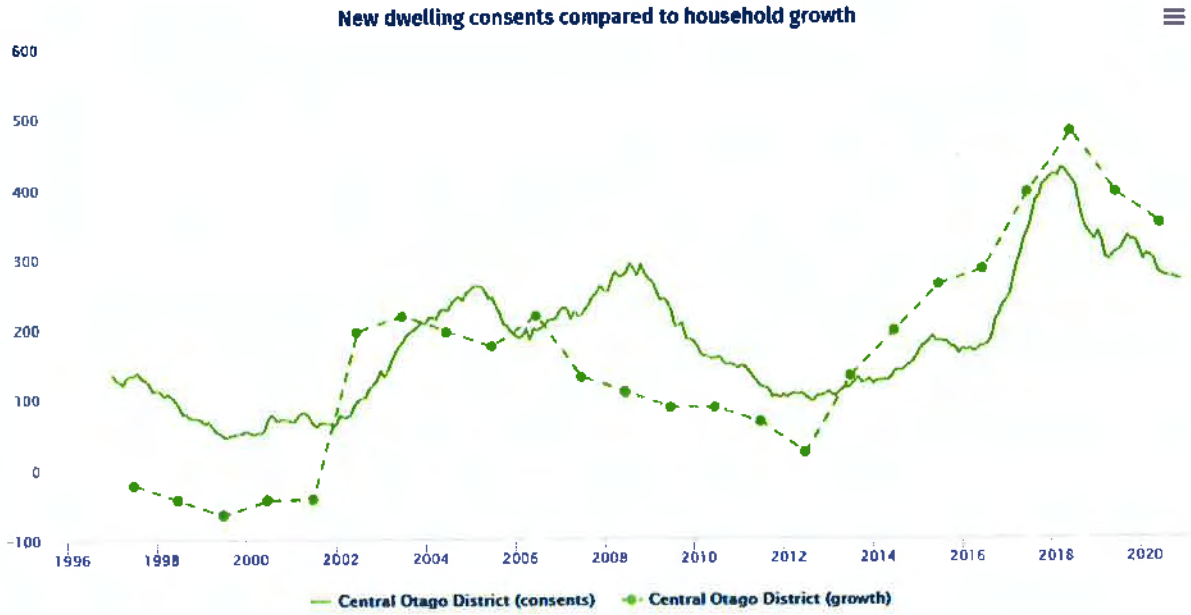


Figure 3.4 represents estimated growth in resident households versus estimated growth in new dwelling consents for total COD (sub-district data is unavailable for this indicator). It shows that the rate of household growth in the district has increased significantly since 2012, from around 20 households per annum to nearly 480 per annum in 2018. While the rate has slowed slightly in the past two years, the annual increase is still high (around 350 per annum estimated in June 2020). Since 2013, the growth rate of new dwelling consents has not always kept pace with demand. It is evident from the title issue data discussed in Section 2.2.3 that Alexandra township has done little to contribute to the supply of district residential lots (akin to new dwellings) in recent years.

Figure 3.4 – COD Household Growth cp Dwelling Consent Growth (MHUD)



4 Future Housing Demand & Capacity

The section examines future growth projections for dwellings in and near Alexandra using a range of data sources. Future housing demand is then compared with high level estimates of plan enabled capacity for housing growth. The proposed Vincent Spatial Plan options are a direct response to both existing issues in the Alexandra housing market and future demand growth – these options are discussed briefly. The proposed Plan Change is considered in the context of those strategic growth outcomes.

4.1 Household and Dwelling Demand Projections

Household and population projections produced by Statistics NZ ("SNZ") for statistical areas below the district level have not yet been produced using a 2018 Census base year. The latest SNZ projections are therefore 2013 based (by CAU). In those projections, the medium growth series projected households in 2018 (and beyond to 2038). When checking these short term projections against the Census household counts for 2018, they were accurate (within 1%) for the district overall and the Alexandra CAU. However, the 2013 SNZ high growth projections slightly over-estimated short term growth in the District and in Alexandra for 2018.

COD Council has commissioned Rationale Ltd to prepare sub-district population, household and dwelling projections on a number of occasions as an input to strategic and infrastructure planning. These custom projections are based on SNZ projections and other inputs and assumptions. In 2017, the Rationale projections contained a Modified and High growth series. The Modified growth series adopted low, medium and high SNZ growth rates as considered likely in each location of the District (i.e. a blend of SNZ projections across the District). We understand the High growth series by Rationale, broadly adopted the SNZ High across all locations. By way of example;

- the Rational 2017 Modified projections estimated growth of nearly 260 occupied dwellings (i.e. resident households) between 2018 and 2038 in the Alexandra CAU. The 2013 SNZ medium growth projections estimated a similar amount of growth - around 280 additional occupied dwellings in the Alexandra CAU in that same period.

- The Rationale 2017 High projections estimated growth of nearly 650 occupied dwellings between 2018 and 2038 in the Alexandra CAU. The 2013 SNZ high growth projections estimated a similar amount of growth (around 600 additional occupied dwellings in the Alexandra CAU in that same period.

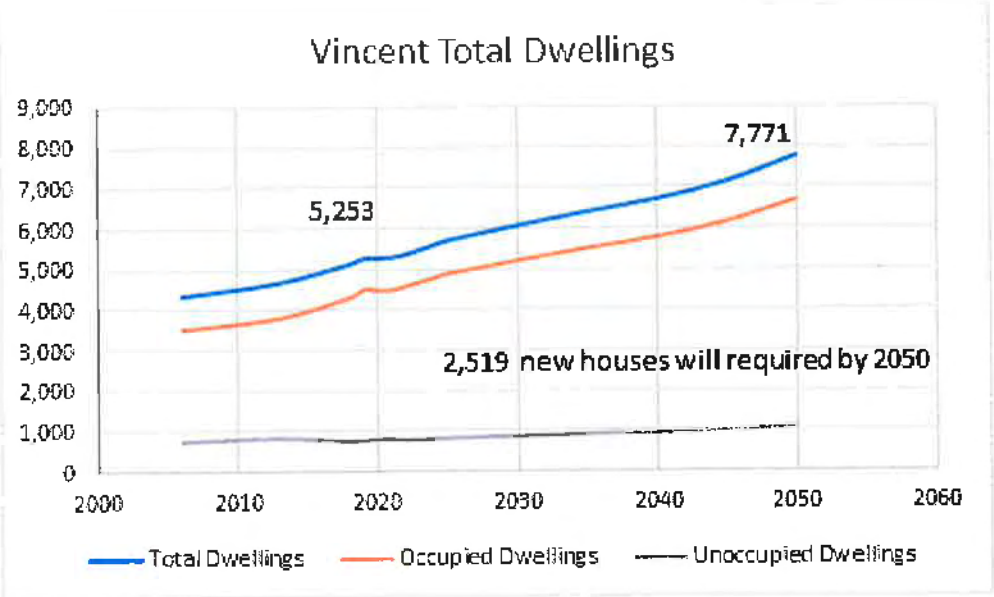
While the boundaries that define Alexandra township have not changed since the 2013 SNZ projections, a limitation of the SNZ projections is that they are by 2013 CAU boundaries (Appendix F) and the large extent of the rural CAUs used at that time do not allow the Vincent Community Board area, or the Vincent Spatial Plan ("VSP") Let's Talk Options[19] area of interest (discussed further in section 4.3) to be aggregated in the

[19] Report dated December 2020.

data. This means that demand in the rural/rural lifestyle areas surrounding Alexandra cannot be easily estimated. As such, M.E has not considered the 2013 SNZ projections further for this analysis.

In order to understand future demand for dwellings in and near Alexandra over the long term, M.E requested the Council's latest dwelling projections by location across the district, or at the least, for the locations in the VSP area of interest. In response, Council provided a 2 page document to M.E containing selected data for the "Vincent Ward" from an assessment prepared by Rationale[20]. The only information provided on dwelling growth in that document was the following graph (Figure 4.1).

Figure 4.1 – Occupied and Unoccupied Dwelling Projections for Vincent 2019-2050 (Council)



We note that the Census 2018 occupied dwelling count for the Vincent Community Board was 4,158. While it is difficult to accurately gauge the 2018 occupied dwelling count from the graph provided, it is considered broadly similar to the Census figure (although probably slightly higher). In another report prepared by Rationale for Council[21], it stated that the Vincent Community Board/Ward had 4,987 total dwellings in 2019. This does not reconcile with the much higher 5,253 stated in Figure 4.1.

In the absence of more detailed data supplied by Council (or more up to date SNZ projections), M.E has adopted the dwelling growth figures as provided in order to maintain consistency with Council information and on the assumption that they relate to the total Vincent Community Board area and not a sub-set of that catchment given that base dwelling figures are already higher, not lower that other figures reported for that catchment.

These latest Council projections for the Vincent Community Board area – with stated growth of 2,519 additional dwellings by 2050 (Figure 4.1) represent a significant rise in expected growth rates compared to Rationale's 2017 projections for the same area. In those earlier projections, long term growth (2018-2048) was 1,050 additional dwellings in the Modified growth series and 2,058 additional dwellings in the High

[20] The Vincent Ward as used by Rationale equates to the SNZ Vincent Community Board area (defined in 2018).

[21] Central Otago Housing Stocktake, March 2020.

growth series. These current growth projections (Figure 4.1) now surpass even the High growth projections over a 30 year period. M.E considers them a reasonable basis for future strategic planning.

The projections (as provided) do not provide a breakdown of growth specifically in and around Alexandra that would provide relevant context for the proposed plan change. M.E has relied on the structure of total dwellings in Rationale's 2017 High projections[22] and applied these to the latest dwelling counts supplied. We have provided a range of outcomes for each location as follows:

- M.E High Scenario – while we believe the projections provided by Council relate to the total Vincent Community Board area, we assume in this scenario that all of the growth is attributed to the VSP area of interest. This approach reflects the statement in the VSP Let's Talk Options report (page 5) that says, "*population projections indicate that by 2050 Alexandra/Clyde area will need over 2,500 more houses*". This statement would leave no growth to the rest of the Community Board Area if the projections supplied are the same as those underpinning the VSP.

- M.E Low Scenario – this scenario attributes around 11% of the stated growth of 2,519 dwellings by 2050 to the rest of the Vincent Community Board, leaving 89% of growth in the VSP area of interest. This is on the basis that we understand the projections to cover the total Vincent Community Board catchment[23].

Figure 4.2 summarises growth by location in the VSP area of interest only under both M.E allocation scenarios. Key results:

- Total long term projected dwelling growth in the area defined as the Alexandra township (by CAU or SA2s) is between 1,270-1,430 or between 42-46 dwellings per annum on average.

- This rate of growth is similar to actual growth rates experienced in Alexandra between the 2013 and 2018 Census (an average of 47 additional occupied dwellings per annum, Figure 2.1).

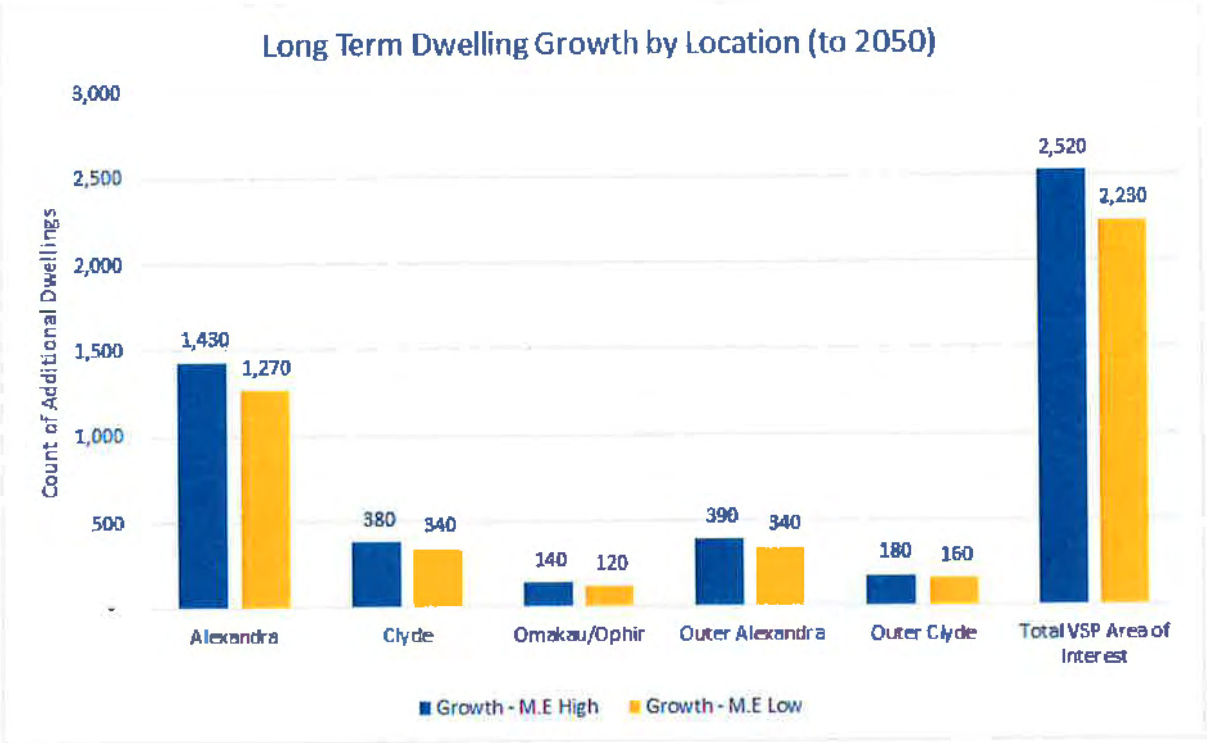
- In Outer Alexandra (Appendix F), total long term projected dwelling growth is estimated between 340-390 or between 11-13 dwellings per annum on average.

- Combined, the wider Alexandra area is projected to require an additional 1,610-1,820 dwellings by 2050 (on average 54-59 additional dwellings per annum).

[22] These projections provide useful area breakdowns including Alexandra, Outer Alexandra, Clyde, Outer Clyde, Omakau/Ophir and total Vincent Community Board. These areas are shown in Appendix F, taken from the Rationale 2017 projections report.

[23] M.E did not pursue further information from Council to help understand which of these two M.E scenarios was most consistent with the assumptions underpinning the VSP on the basis that our initial request for data (of this nature) was not met by Council.

Figure 4.2 – Estimated Long Term Dwelling Growth by Location in the VSP Area of Interest (M.E)



4.2 Capacity for Dwelling Growth

4.2.1 Capacity in the Township

This section examines at a high level the current plan enabled capacity available in and around Alexandra to cater for the projected dwelling growth over the long term. As discussed earlier in the report, while intensification of existing urban areas can cater for a portion of demand growth, this is likely to occur at a slow rate, spread throughout the older parts of the RRA zone. The most commercially feasible option for meeting the major share of growth is via greenfield development. As such, this section identifies a small number of already zoned greenfield sites (estimated by M.E to be vacant and generally developable) in the Alexandra township. The sites are mapped in Appendix H, with 2 currently being developed or consented for subdivision. M.E did identify four other zoned greenfield sites but discounted these because the constraints of each site mean that they are not reasonably expected to be realised[24]. Figure 4.3, summarises zoning, ownership, developable zoned area and potential dwelling yield of those sites according to two different densities (delivering 500sqm to 700sqm residential lots unless otherwise constrained to larger lots).

[24] RRA zoned sites excluded from M.E's growth capacity estimates were: north west of Walnut Grove (privately owned) – constrained by flood and slippage hazards and underground coal mine activity; east of Gillaly Way (privately owned) – constrained due to being a steep gully covered in wilding pines; south of Gillaly Way (privately owned) – constrained due to severe steepness; east of Molyneux Estate (Council owned) – identified as future playing fields by the community board in a management plan. It was considered that all of these sites offered no feasible development potential.

Assuming no other constraints to development (not investigated by M.E for this report although some noted below Figure 4.3), we indicatively identify 46ha of existing plan enabled greenfield land in the RRA zone. This is estimated to potentially yield between 420-580 additional dwellings if/when developed. This yield may be considered an upper limit as there may be a number of reasons why development of these sites is constrained to the extent that it limits the yield of residential lots. The presence of this plan enabled capacity is a positive result for Alexandra as it is better than having no greenfield growth potential and it provides direction on where future growth is anticipated in the urban area. However, that benefit is eroded if that land is not released to the market in a timely manner.

Figure 4.3 – Estimated Plan Enabled Urban Greenfield Sites (M.E Desktop Only)

Location (Refer Order in Appendix H)	Parcel Intent	Owner	Zone	Parcel Area (Ha)	Res Zoned Share	Est. Zoned Area (Ha)	Est. Net Developable Area (70%)	Estimated Yield Low	Estimated Yield High
Main Urban Area									
N of The Pines	Fee Simple	CODC/Crown***	RRA	40.2	47%	18.9	13.3	189	265
N of Molyneaux Estate	Legislation	Crown	RRA	14.9	100%	14.9	10.4	149	208
NE of Molyneux Estate/Dunstan Rd *	Fee Simple	CODC	RRA	10.1	70%	7.1	4.9	71	99
Sub-Total Main Urban Area				65.1		40.9	28.6	409	572
Bridge Hill									
Lanes Road** #	Fee Simple	April Construction Ltd	RRA	8.3	50%	4.1	2.9	8	8
N of Kamaka Crescent **	Fee Simple	Ross Hay	RRA	1.3	100%	1.3	0.9	2	2
Sub-Total Bridge Hill				9.5		5.4	3.8	10	10
TOTAL ESTIMATED VACANT GREENFIELD				74.7		46.3	32.4	419	582

*Source: Grip.co.nz, CODC District Plan, LINZ, M.E. * Approx. 60 lots now consented in JV with Council. ** sloping site, highly constrained. *** Gazetted Tree Planting revoked on portion of land. # currently being developed into 8 lots.*

A key feature of these greenfield sites is that in the main urban area, a significant 100% of vacant capacity is owned by CODC or the Crown. Greenfield land in the Bridge Hill area is all privately owned but contributes just 2% of all urban greenfield development capacity identified. Overall, based on the sites identified by M.E, the Crown/Council control a significant 98% of potential growth capacity in the township. This is a very high percentage (and we suspect somewhat unique situation) and does not represent a competitive market. This may partially explain why supply of new residential titles has been low in Alexandra, particularly in recent years[25].

4.2.2 Sufficiency of Plan Enabled Capacity in the Township

Setting aside whether the plan enabled greenfield land is infrastructure ready (or will be at some point over the long term), this indicative greenfield capacity would cater for between 29% (Low Yield and High Demand Scenario) and 46% (High Yield and Low Demand Scenario) of projected demand within Alexandra township if fully developed as estimated in Figure 4.3. This equates to between 9 and 14 years of projected growth (based on average annual growth rates over the long term) if brought to the market at a rate of 42-46 sections per annum.

While intensification/infill is likely to cater for a small portion of demand in addition to greenfield capacity, M.E find that there is insufficient capacity in existing zoned areas to cater for projected long term dwelling growth. This suggests that if Council are to provide for projected demand, additional dwelling capacity

[25] At the time of drafting this report (19th March), just 3 urban sections were listed for sale in Alexandra. Only 1 was in a greenfield subdivision and the other 2 are result of infill subdivision. Prices ranged from $265,000-$325,000.

needs to be enabled in the Alexandra township. Given that the RRA zone is already enabling of medium density development, greenfield expansion is likely to be the most effective option.

4.2.3 Capacity in the Rural/Rural Lifestyle Areas Surrounding Alexandra

Based on M.E's desktop analysis, there is still potential for further fragmentation of lots in the Rural Residential zone in Outer Alexandra (cohesive zone areas immediately adjoining the Alexandra township but excluding those zone areas adjoining Clyde township). There are an estimated 92 parcels that are greater than 4ha in this zone area that could yield 264 2ha parcels. This is a potential net increase in parcels able to take a dwelling of 172.

4.2.4 Sufficiency of Plan Enabled Capacity in Areas Surrounding Alexandra

This indicative plan enabled capacity (172 lots) could cater for an estimated 44-51% of long term growth projected in Outer Alexandra over the long term (14-15 years of demand growth based on an average growth rate of 11-13 new dwellings per annum). Further fragmentation of the RuRA zone could provide for an additional but small portion of demand (at a cost to rural character and productive potential), but overall, M.E does not expect that the RuRA and Rural Residential zones combined will be sufficient to cater for long term demand projected in Outer Alexandra. This suggests that if Council are to provide for projected long term demand in this location, additional dwelling capacity needs to be enabled in Outer Alexandra.

4.3 Vincent Spatial Plan Options

The housing market trends and issues set out in this report are not unknown. Council has commissioned a number of reports, including the Central Otago Housing Stocktake (March 2020), and carried out community consultation, that highlight similar concerns and provide recommendations/guidance to Council. The proposed Vincent Spatial Plan is a proactive response by Council to address Alexandra's housing issues and future growth in a strategic and coordinated way. The area of interest of the VSP is shown in Appendix I.

The VSP Let's Talk Options report (December 2020) identifies three potential options for managing growth in and around Alexandra. In summary, these options area:

1. Managed growth through urban expansion and rural residential infill.
    - Key aspects of this option, from M.E's perspective and based on the examples of different densities set out in pages 11 and 12 of the VSP report, is that it may further lower the minimum lot size in the operative RRA zone to encourage medium density development (although this is a marginal change from current provisions), identifies low density residential in areas already zoned for RRA (so not net change), up-zones an area of low density residential east of Dunstan Road (greenfield expansion), up-zones land north, east and west to create a large lot residential living option, provides for greater intensification of parts of the Rural Residential zone and provides expansion for rural lifestyle living (new area focussed on Chapman Road.

- This option responds to recent patterns of demand where an increasing share of Alexandra's growth has been focussed outside of the urban area, although seeks to use that land more efficiently than in the past. It provides a more diverse range of living options and a better transition of density from core urban through to rural, although places a greater share of Alexandra's future residents in locations with a longer drive to town facilities and services.

2. Managed growth balanced between urban and rural.

    - Key aspects of this option, from M.E's perspective, is that it is likely to halt/lessen fragmentation of the Rural Residential zone north east of Dunstan Road, while directing further fragmentation (intensification) in the Rural Residential zone between Alexandra and Clyde. It provides some new rural residential living options along Chapman Road and up zoning of the RRA 9 zone to low density housing. Low density housing is allowed to expand along a short stretch of State Highway 85. It encourages more extensive areas of (up-zoned) medium density housing including on vacant greenfield land which is likely to be effective (relative to the infill of existing RRA zone areas up-zoned around the current town centre). It provides one area of large lot residential along Dunstan Road.

    - This option partially responds to recent patterns of demand for dwellings outside of the township but sets some limits to that growth compared to option 1. It shifts the weight of urban capacity more towards medium density. It provides a more diverse range of living options and while it creates a better transition of density from core urban through to rural along Dunstan Road, it effectively retains a 'hard' urban edge elsewhere. Compared to option 1, this option is likely to help direct more future growth to within the township while still providing for dwelling growth in a range of types and locations.

3. Managed growth mostly contained in existing urban areas and some urban expansion.

    - Key aspects of this option, from M.E's perspective, is that it is likely to curb most dwelling growth in Outer Alexandra while requiring more of the growth to be met within the urban area, which itself is only slightly expanded beyond current zone areas. A small portion of the greenfield land north of The Pines (already zoned RRA zone) is up-zoned to medium density (but with no additional amenity provided in that location to attract households to this fringe location). And extensive areas of the existing central urban area up-zoned to medium density. Urban expansion is limited to east of Dunstan Road and up-zoning of the RRA 9 zone. No large lot residential living option is provided and only a very small area of proposed rural residential living (i.e. 5,000sqm-2ha lots as per the VSP report) is provided on Dunstan Road.

    - This option retains a compact urban form but provides the least variation in dwelling/property types. There is a risk that it will not provide for projected dwelling demand in Outer Alexandra, and with the urban area expected to transition to even smaller lots, there is more chance that the segment of demand looking for large lot

or rural residential living options will look elsewhere. This option would require a significant increase in the rates of infill development and redevelopment compared to rates achieved in recent years (these have been low even when there has been limited or no greenfield growth competition). Relying extensively on infill intensification is risky when the capacity is spread over a very large number of individual property owners.

All of these VSP options provide capacity for growth but in different ways although much of it is already plan enabled under the operative Plan. All options use land more efficiently than has been done in the past. Option 1 moves with current market preferences/supply trends and reflects more of a business as usual growth path, while Options 2 and 3 require a degree of shift in the market (by both developers and buyers), particularly towards more intensive forms of urban development. A more prescriptive approach to identifying areas of medium density housing may help improve housing affordability (by reducing lot sizes and therefore land prices as a share of total property costs). Options 1 and 2 create greater variety in dwelling/property types (a current housing issue) and would bring Alexandra more in line with the housing options provided in Cromwell – which has been effective in attracting household growth in recent years.

Figure 4.4 – Plan Change Site Relative to VSP Options 1 and 2

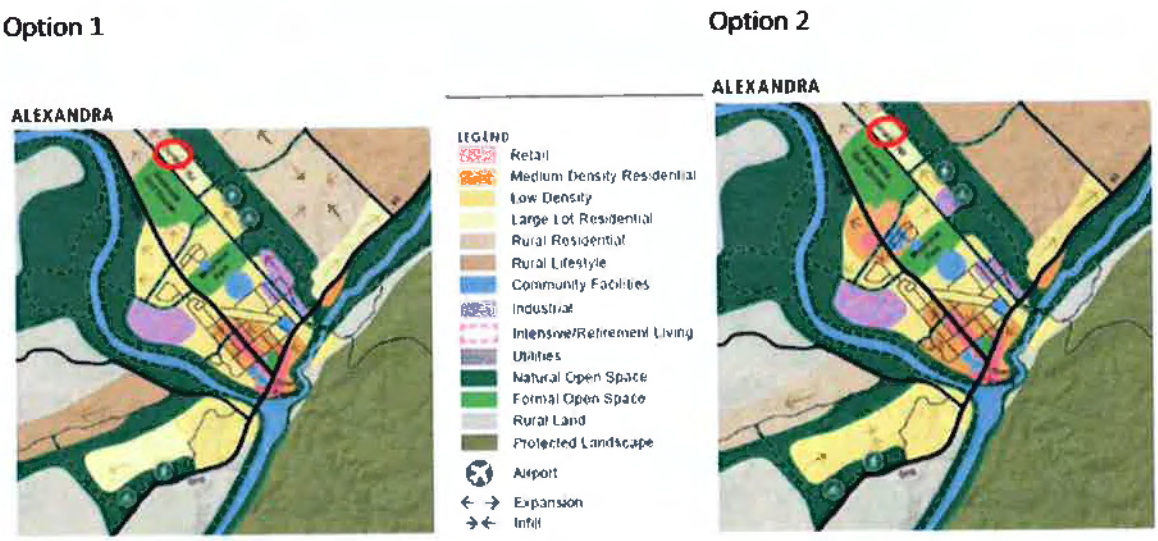


Figure 4.5 - Large Lot Residential Typology as Defined in the VSP Let's Talk Options Report

LARGE LOT RESIDENTIAL

DENSITY	2 - 10 DW / HA
TYPICAL SECTIONS	1,000 - 4,000 sqm
TYPICAL HOUSING TYPES	Detached houses on a large section

QUALITIES

- Open garden setting and quieter living environment with opportunities for informal social contacts within local area.
- Some ability to be self-sufficient with vegetable gardens and chickens.
- More reliance on cars to access most destinations.
- Accommodates large household sizes with generous yard spaces for adult recreation and children's play.
- Less affordable through larger lot sizes and higher infrastructure costs.
- Higher property maintenance allowing less time for local recreation and social activities.
- Garage and on-site car parking for multiple cars on site.

Importantly, the proposed plan change at William Hill is consistent with the strategic outcomes sought in options 1 and 2 of the VSP as shown in Figure 4.4. In both of these options, the site is proposed for large lot residential dwellings and the plan changes proposes a density that fits within the definition provided in the VSP (Figure 4.5). While it is too soon to know what growth option will become the preferred option for Alexandra, it is positive that the plan change could effectively implement two of the three options.

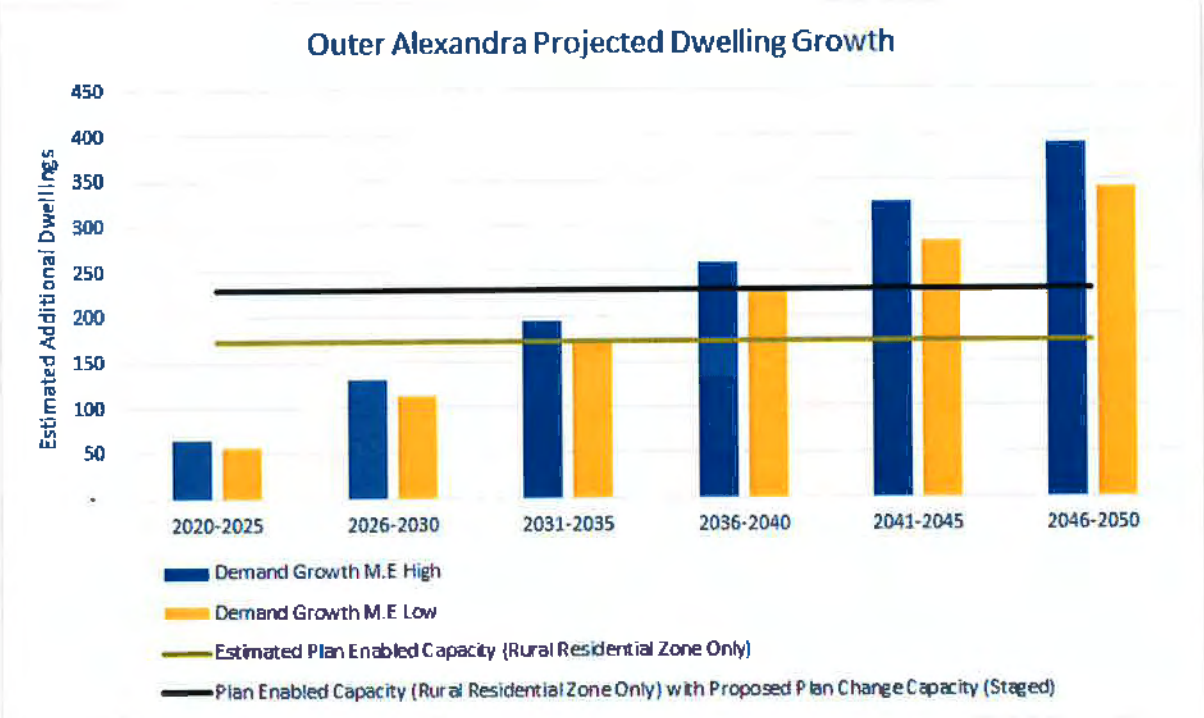
5 Conclusions

This section considers the proposed private plan change in the context of Alexandra's projected dwelling demand growth and current plan enabled dwelling capacity. It then summarises the anticipated costs and benefits of the proposed plan change from an economic perspective.

5.1 Providing for Growth in Alexandra

As discussed in Section 4.1, growth in dwellings in Outer Alexandra (see map in Appendix G) is projected to occur at a rate of 11-13 additional dwellings per annum over the long term (M.E Low and High Scenario respectively). Section 4.2 estimates that the indicative remaining capacity in the Rural Residential Zone contiguous with Alexandra township (and assuming no changes in operative zoning over the long-term) is 172 net additional lots, with subdivision of the RuRA zone providing some additional capacity. Figure 5.1 combines both demand growth and Rural Residential zone capacity over time, showing that capacity is likely to be exhausted at around 2035 (or slightly sooner under the M.E High Scenario). Figure 5.1 also shows the cumulative effect of the proposed capacity for an additional 60 large lot residential dwellings in Outer Alexandra (net additional 56 dwellings given that 4 dwellings are already counted in the Rural Residential zone capacity).

Figure 5.1 – Proposed Plan Change Capacity Relative to Demand Growth in Outer Alexandra



The proposed plan change would help extend capacity in Outer Alexandra such that projected demand to 2040 (or slightly before under the M.E High Scenario) could be catered for. The plan change does not

provide for all of the projected long term shortfall in capacity in Outer Alexandra but does delay the time within which more capacity would need to be zoned. A key effect of the plan change is that it would provide for between 4.5 and 5.5 years' worth of dwelling growth in Outer Alexandra in a considerably more efficient way – taking up just 16ha of land, while the equivalent capacity in the Rural Residential zone would take up 120ha of land (at an average size of 2ha each). It also consolidates the capacity into a single location on a main road.

Figure 5.2 – Proposed Plan Change Capacity Relative to Total Demand Growth in Wider Alexandra

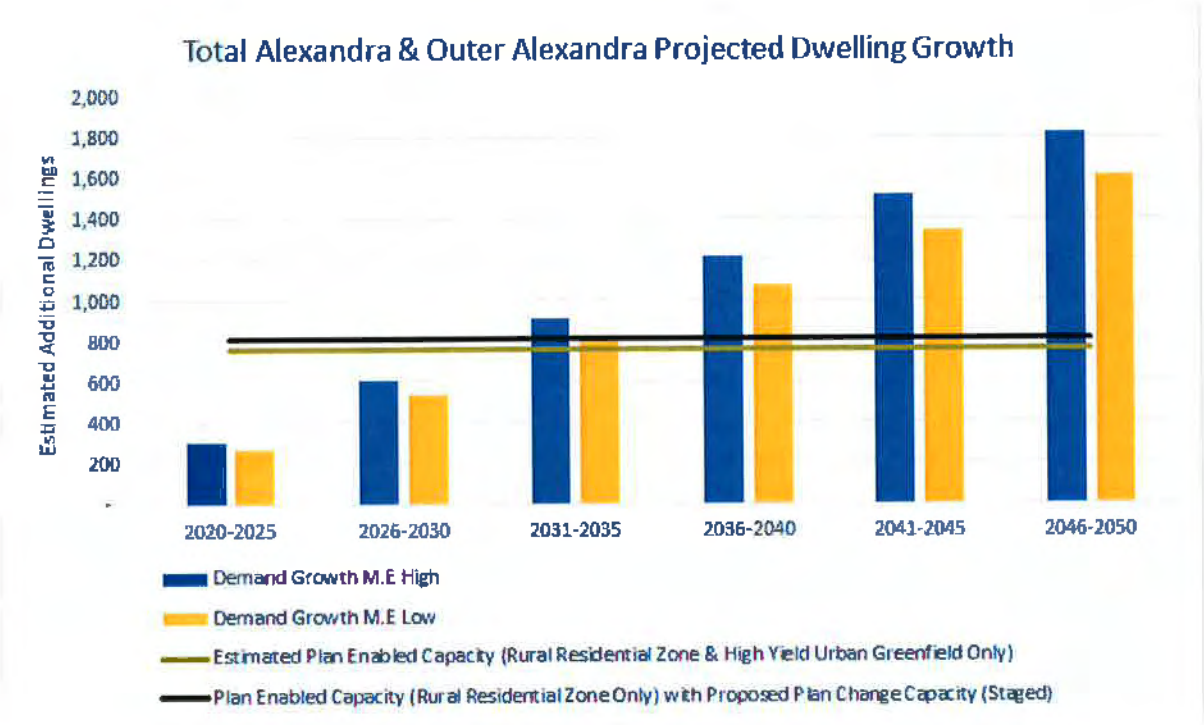


Figure 5.2 compares projected dwelling demand in both urban Alexandra and Outer Alexandra combined (Appendix G). It also combines indicative estimates of plan enabled greenfield capacity in the RRA zone (high yield scenario) with the estimated dwelling capacity in the Rural Residential zone. As discussed in Section 4.2, zone capacity in wider Alexandra is likely to be exhausted soon after 2032-2033 unless further changes are made to District Plan zoning. Figure 5.2 includes the cumulative capacity proposed by the private plan change (60 additional large lot dwellings or a net additional 56 dwellings for the purpose of this graph). While the plan change makes a meaningful and efficient contribution to capacity in Outer Alexandra (Figure 5.1), it makes only a minor contribution in the context of overall plan enabled capacity and demand in wider Alexandra. M.E considers this relevant, because if there was any concern that the plan change will draw growth away from the urban area in the short-medium term, any such effect would be minor.

5.2 Economic Costs and Benefits of Request

There are a number of economic benefits arising from the proposed private plan change. Care is however needed to distinguish the benefits of providing for growth *per se* from the benefits of providing for growth

in this location. The reason for this is that COD may still achieve the same overall growth if demand for dwellings in Outer Alexandra is deflected elsewhere in the district in the absence of any additional growth capacity.

The key economic benefits arising from the proposed plan change include:

- Provides housing capacity in a location of moderate market demand (i.e. in Outer Alexandra). Helps reduce a projected shortfall of dwelling capacity in Outer Alexandra in the long term.
- Provides a greater choice of housing for households wanting to move to or stay in Alexandra. The plan change would deliver a lot size not otherwise provided for Alexandra.
- The additional capacity, will facilitate greater churn in the local housing market (which can be a stimulus for redevelopment and infill), allowing households to shift within wider Alexandra as their housing needs change with life stage.
- Facilitates Alexandra's population growth, including growth of the Alexandra work force – supporting economic growth within Alexandra businesses and increasing the vibrancy of the town centre by facilitating demand for local shops and services.
- The development of the land at a large lot residential density, as opposed to operative Rural Residential or RuRA zone densities, increases the efficiency of dwelling growth in Outer Alexandra – reducing the consumption of the rural land resource for housing and helping to reduce the fragmentation of rural land and the dispersal or households.
- It concentrates 60 net additional dwellings in close proximity to the current urban edge. The site offers potential for active transport (particularly biking using the Central Otago Rail Trail on the opposite side of Dunstan Road.
- Although large lot residential properties are not targeted at 'affordable housing', it is relatively more affordable than most Rural Residential zone alternatives due to the smaller land area. The additional housing capacity will help (to a minor degree) alleviate rising dwelling prices and rents driven by the type of property delivered to the market and an imbalance between supply and demand across wider Alexandra compared with the status quo.
- The plan change would enable a private landowner to bring 60 new greenfield sections to the market in the short-medium term – increasing the competitiveness of the Alexandra housing market which is effectively controlled by the COD Council.
- The plan change would implement two out of three options proposed for the VSP – being large lot residential land use along this portion of Dunstan Road. It is also likely to deliver that proposed land use outcome sooner than if the site was reliant on a comprehensive plan change initiated by Council (i.e. will deliver housing benefits sooner rather than later).
- Further, if proposed options 1 or 2 are adopted for the VSP, development of the plan change site in the short-medium term may help implement the land use outcomes intended elsewhere along Dunstan Road. I.e. it may stimulate the change in land use where zoning is intensified by giving surrounding landowners more confidence to subdivide and meet the market.

The potential economic costs of the private plan change are those typically associated with housing development (and are not unique to this location). This includes loss of capacity for rural residential dwellings on the fringe of Alexandra (assuming no change to operative zoning), the potential opportunity cost of slower price rises for current Outer Alexandra dwelling owners (as a result of greater supply and competition) and the additional pressure on local services, schools, roads, parking and infrastructure associated with additional households using the town centre. There is a cost associated with meeting this demand, although that cost depends on the ability of services and infrastructure to absorb further growth using current resources[26].

There is a potential opportunity cost on the uptake of residential capacity in the urban area – particularly if this is one of only two options for moderately scaled greenfield growth in or near to Alexandra in the short-medium term[27]. That said, there is other plan enabled residential capacity that can and should be released in the urban area as growth is currently being constrained in the township in our view. There is sufficient growth in Alexandra and Outer Alexandra to support the plan change and other greenfield residential developments at the same time. The proposed plan change also offers a complementary and not competing density to urban plan enabled capacity. Further, this effect is only a potential redistribution of growth in the short-medium term and not a change in overall growth. The economic benefits to the town centre would be effectively the same.

Overall, M.E considers that the anticipated economic benefits of the private plan change will outweigh the potential economic costs. The plan change would positively contribute to the economic wellbeing of the Alexandra community and is consistent with strategic planning options being considered by Council.

[26] E.g., the ability of the local schools to take additional enrolments without needing a new classroom.

[27] Here we take account of the 60 lot (approx.) subdivision consented in the urban area (joint venture with Council).

Appendix A – COD Zone Schedule

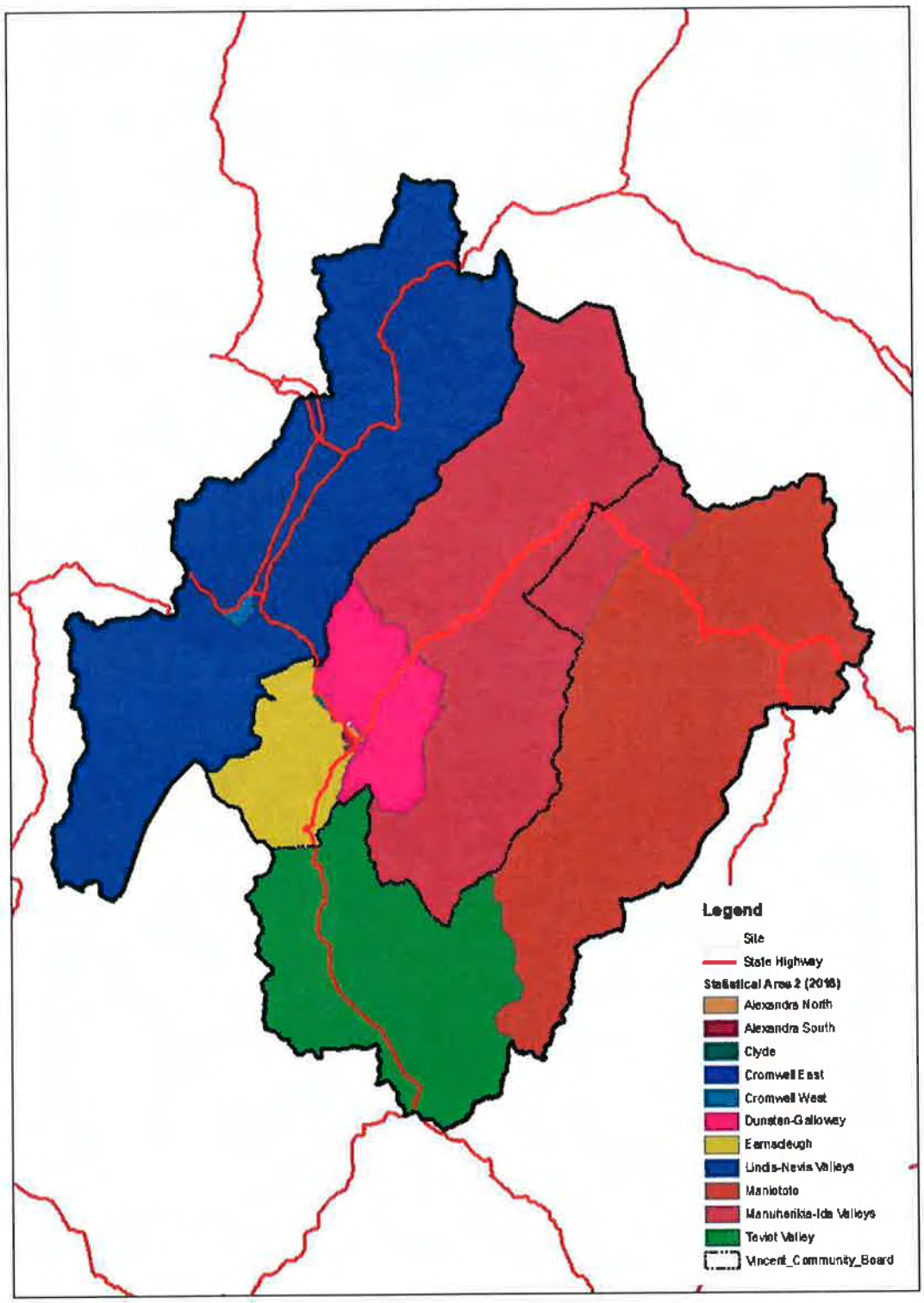
Rural and Residential District Plan Zone:

Zone	Minimum Lot Size (sqm)	Average Lot Size no less than (sqm)	General Locality(s)	M.E Approx. Density Category (independent of Resource Area Type)
RRA (Reticulated)	250	na	Urban Towns	Residential
RRA11	400	na	Pisa Moorings, Wooing Tree	Residential
RRA12 *	500	na	Cromwell urban	Residential
RRA13	600	800	Pisa Moorings	Residential
RRA (Unreticulated)	800	na	Urban Towns	Residential
RRA10	800	na	Shaky Bridge, Alexandra	Residential
RRA3	1,000	na	Pisa Moorings, Cromwell lake edge, NE Alexandra	Residential
RRA8	1,500	na	Near Cripplетown/Bendigo	Large Lot Residential
RRA4	1,500	2,000	Bannockburn	Large Lot Residential
RRA1	3,000	na	Small pockets Dunstan lakeside	Large Lot Residential
RRA5	3,000	na	Lowburn	Large Lot Residential
RRA6	4,000	na	Cromwell urban edge and Roxburgh	Large Lot Residential
RRA2	4,000	10,000	Cromwell rural fringe	Large Lot Residential-Rural Lifestyle
RRA9	6,000	na	Bridge Hill, Alexandra	Large Lot Residential
RRA7	10,000	na	Patearoa (wider Ranfurly)	Rural Lifestyle
RuRA2	10,000	na	Near Cripplетown/Bendigo	Rural Lifestyle
Rural Residential	na	20,000	Cromwell rural fringe, incl. Lowburn and Bannockburn	Rural Lifestyle
Rural	20,000	80,000	General rural	Rural Lifestyle & Rural
RuRA3 **	1,500-40,000		Conroys Road, wider Alexandra	Large Lot Residential-Rural Lifestyle
RuRA4 ***	na	na	McCarthur Ridge, wider Alexandra/Clyde	Rural Lifestyle & Rural
RuRA1	100,000	250,000	Near Cripplетown/Bendigo	Rural

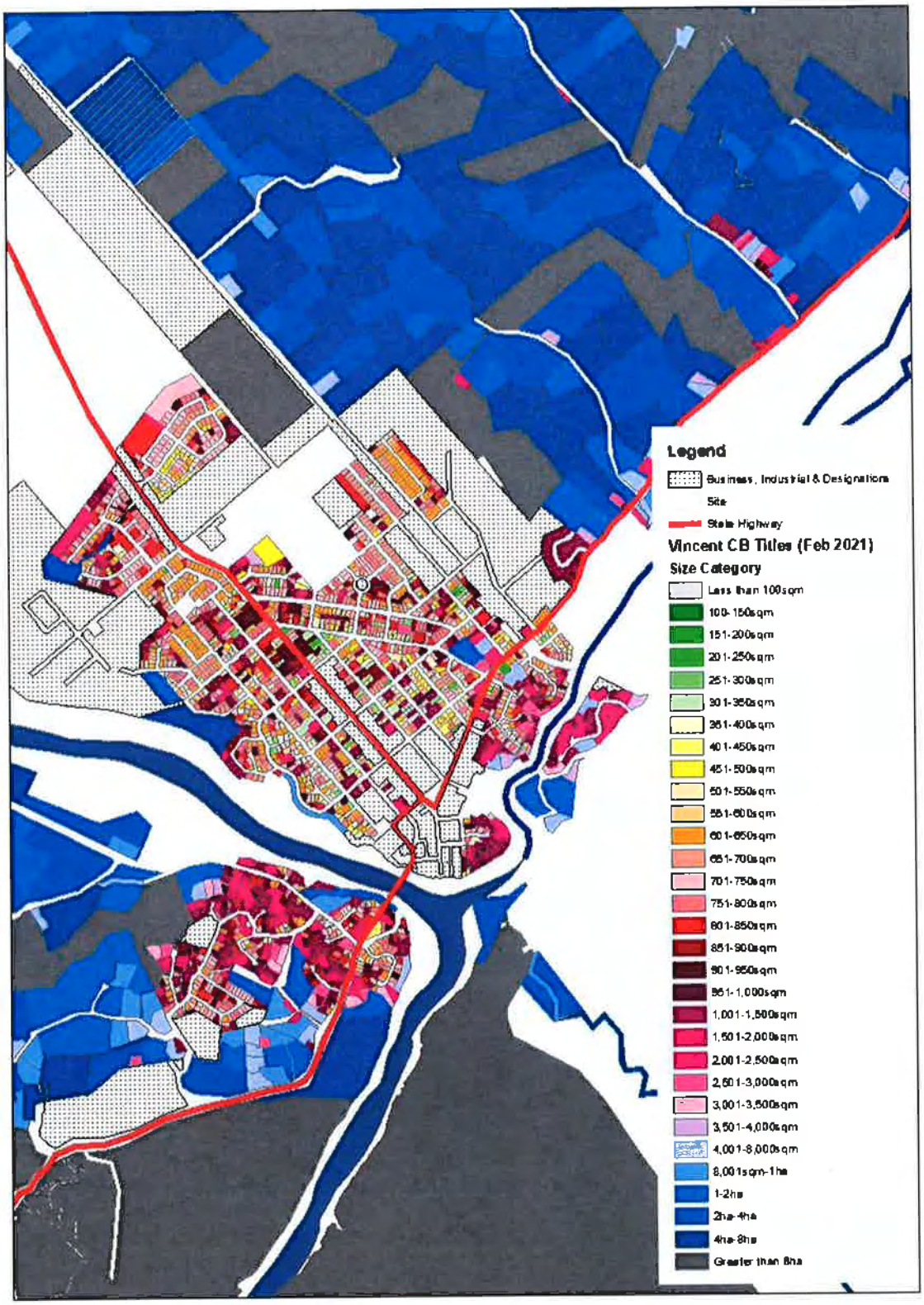
*Source: Central Otago District Operative District Plan, M.E. Grey rows are zones present in and around Alexandra. * 1,000sqm minimum adjacent to SH6. ** Maximum lot size for lots not 4ha is 9,000sqm. *** Density controlled by concept plan.*

Appendix B – District SA2 Boundaries

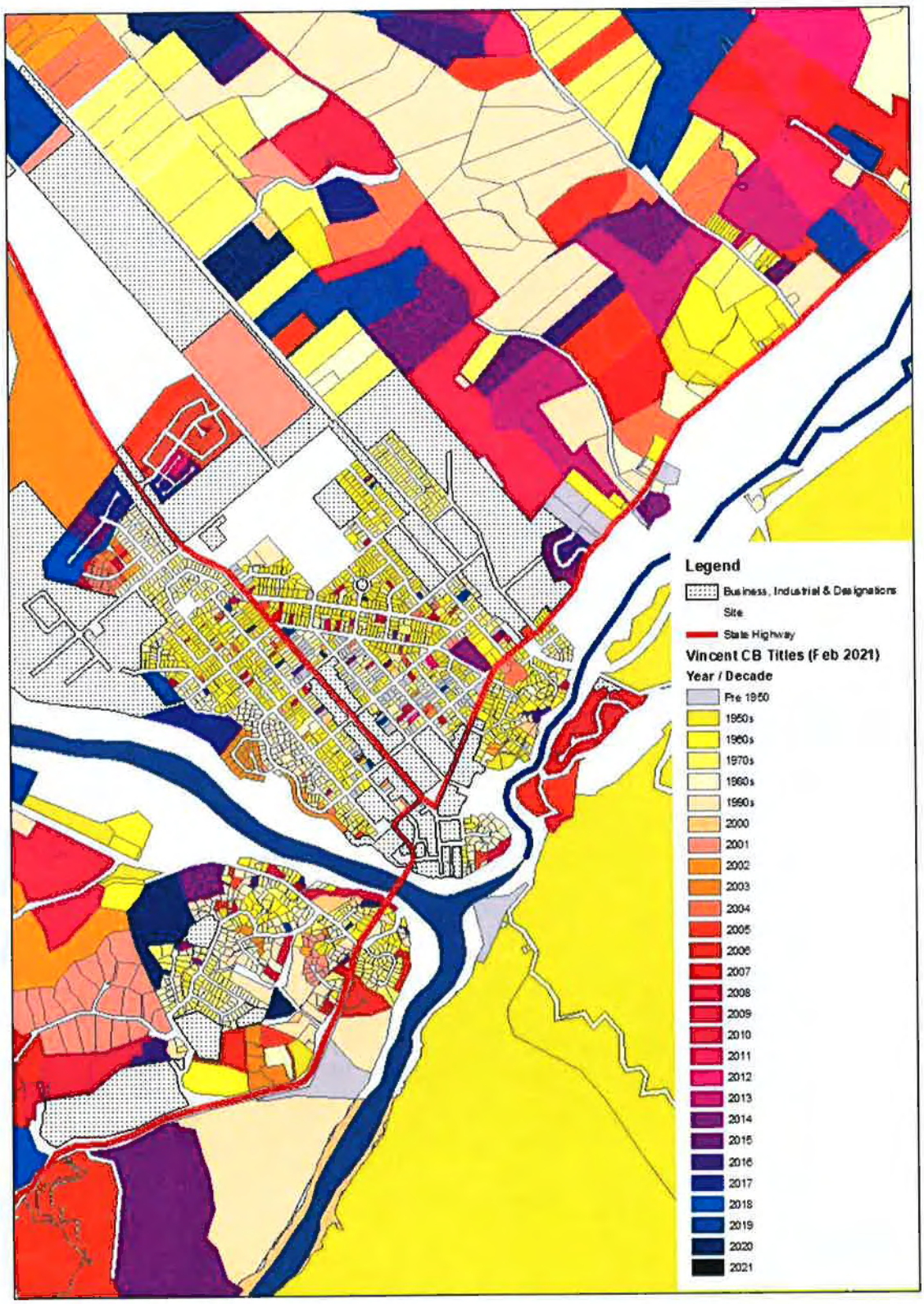
Statistics NZ 2018 Statistical Area 2 boundaries in Central Otago District.



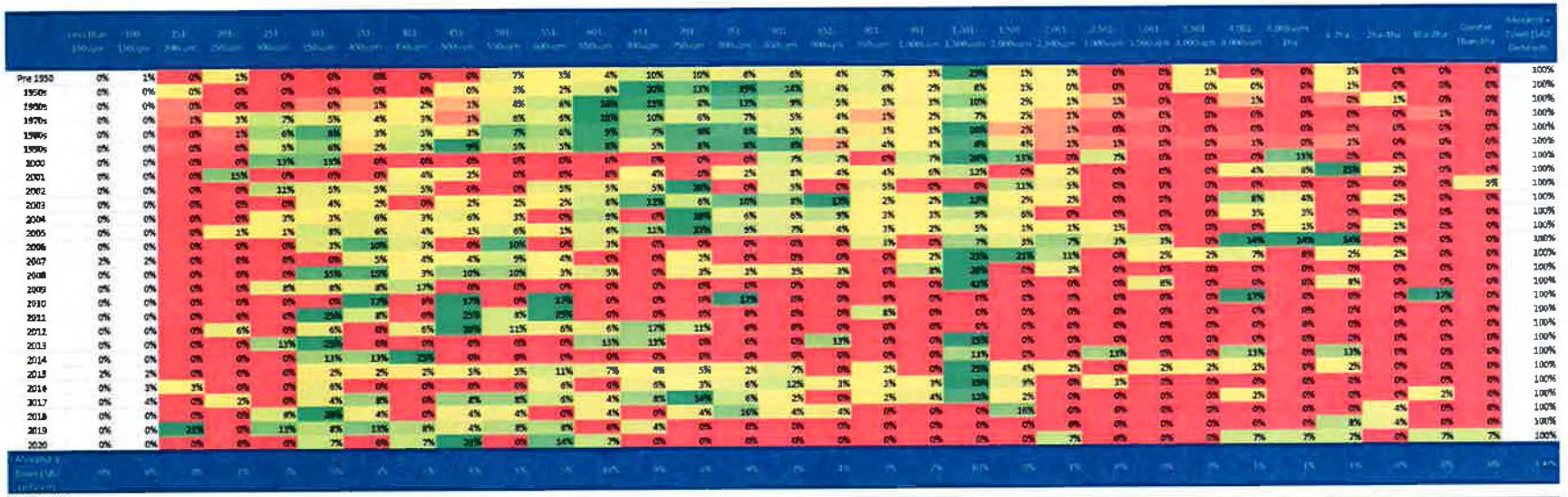
Appendix C – Lot Size Patters Town Extent



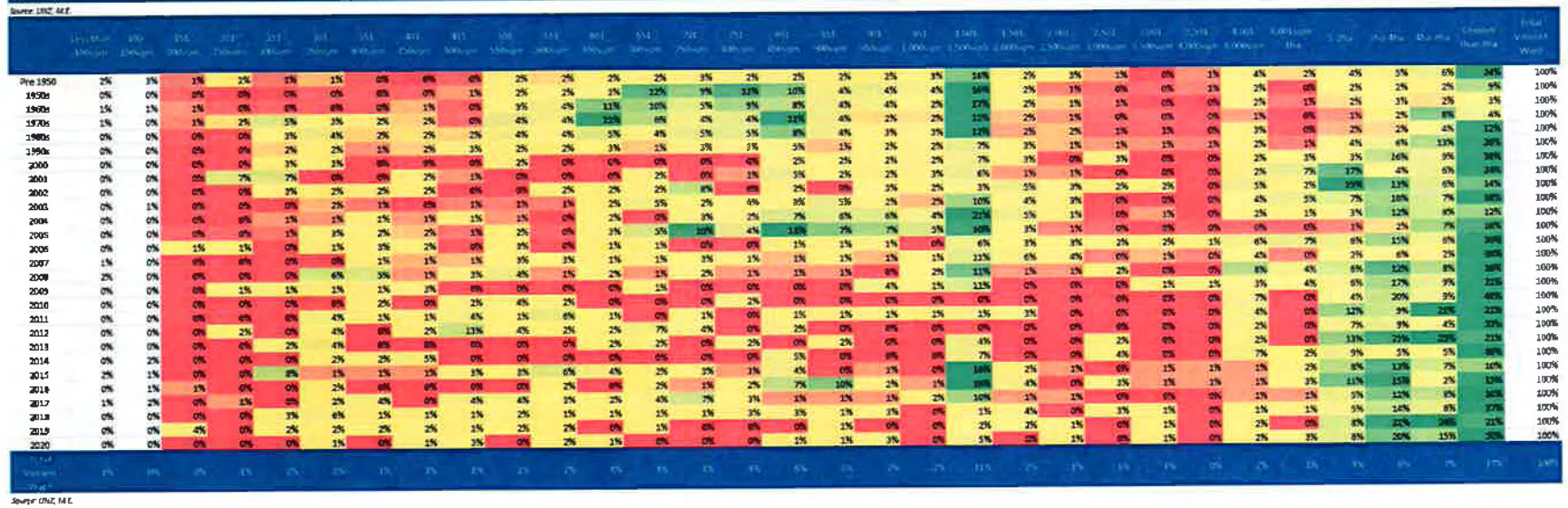
Appendix D – Title Date Patterns Town Extent



Appendix E – Land Supply by Date and Size



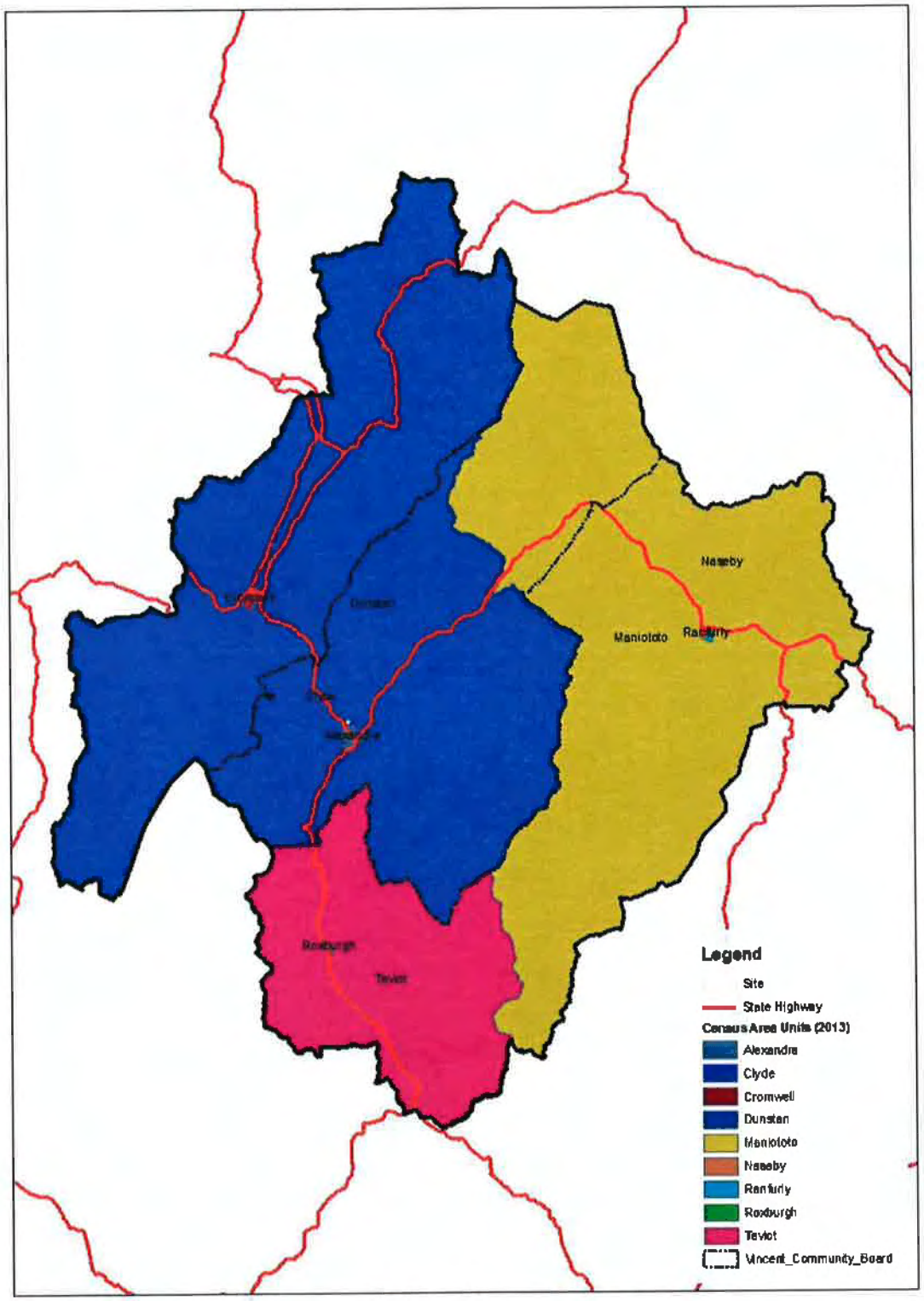
Source: LINZ, M.E.



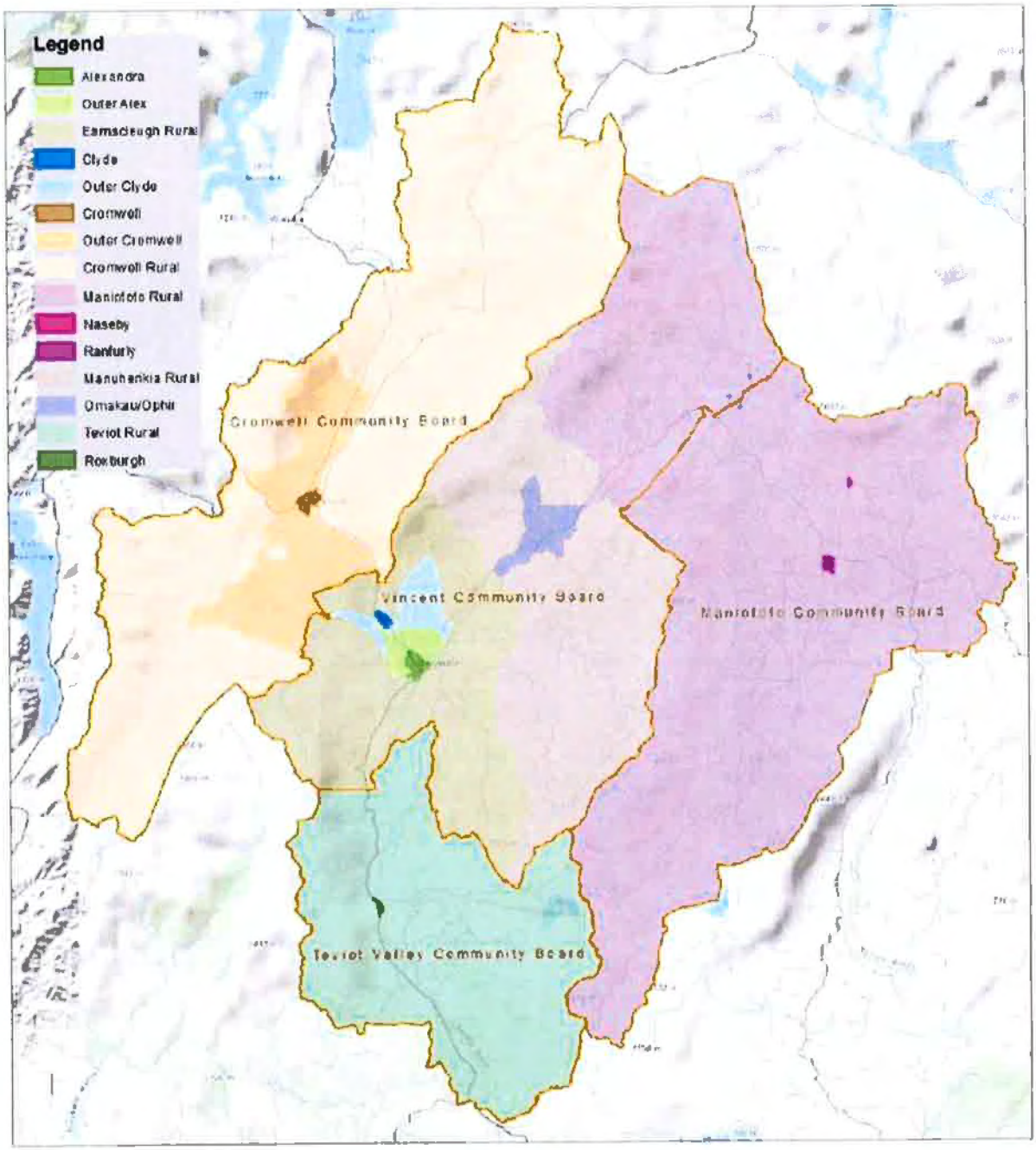
Source: LINZ, M.E.

Appendix F – District CAU Boundaries

Statistics NZ 2013 Census Area Unit boundaries in Central Otago District.

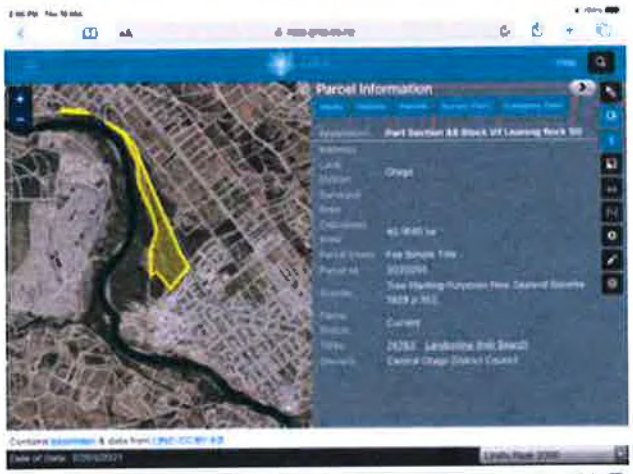


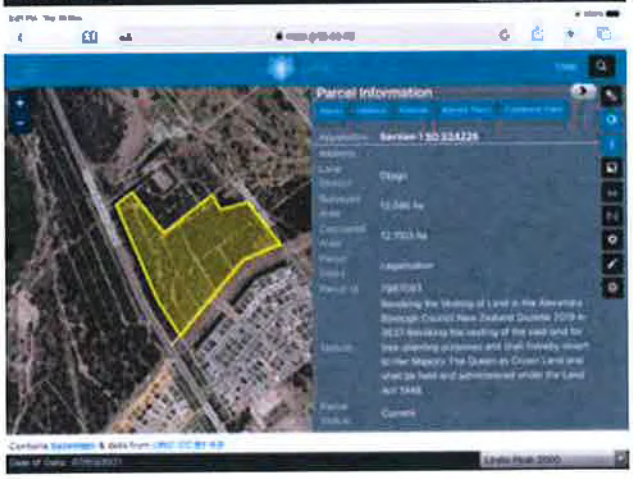
Appendix G – Rationale Projection Areas 2017



Appendix H – Estimated Zoned Urban Greenfield Capacity (Realisable)

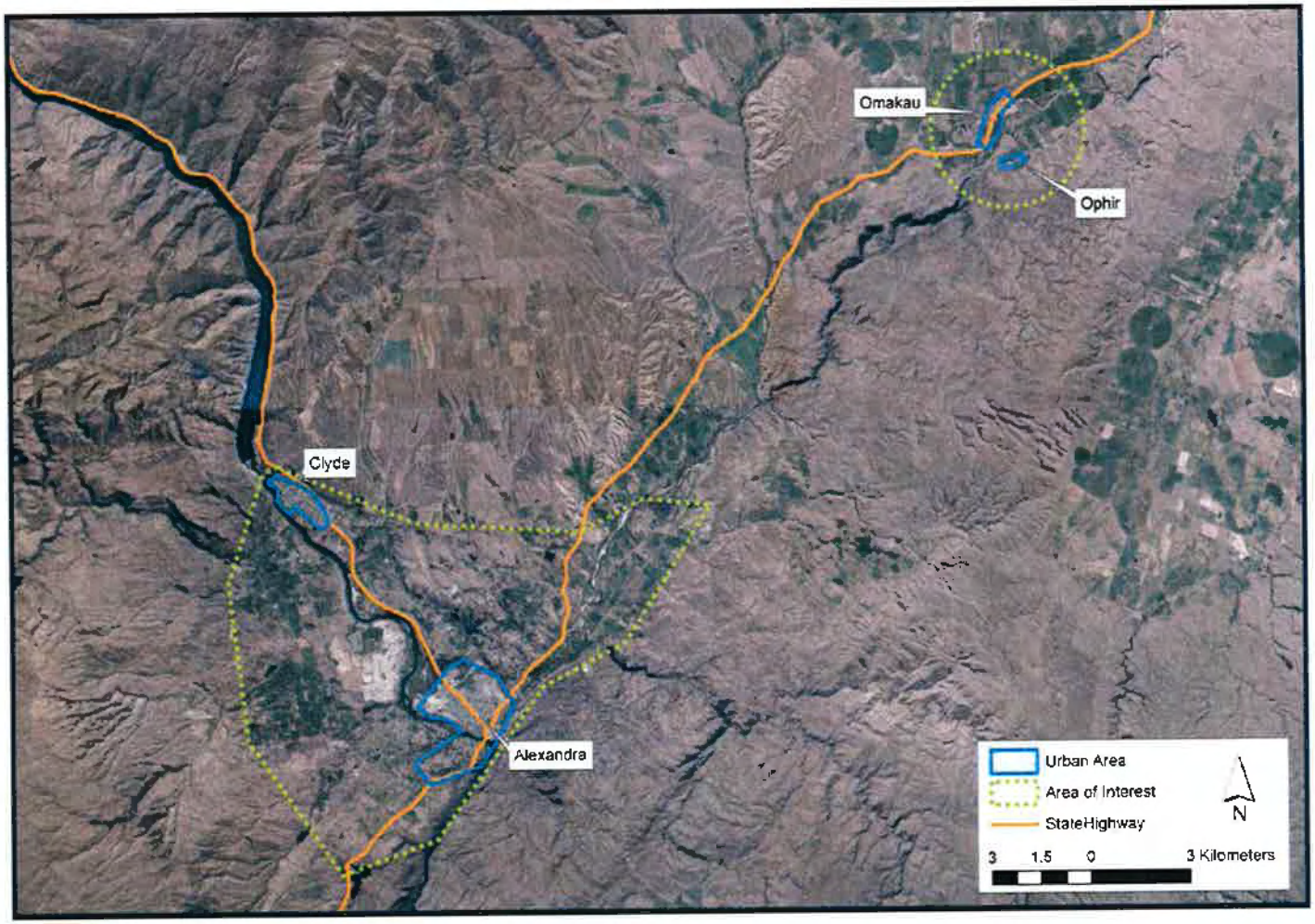
The following parcels are identified as vacant land not otherwise occupied by a lifestyle property and that are zoned Residential Resource Area zone in urban Alexandra and reasonably able to be developed for one or more dwellings. Details of each parcel sourced from Grip.co.nz.






Parcel Information
Parcel Information
Parcel Information

Appendix I – VSP Area of Interest



The geographic scope of the Vincent Spatial Plan.

Appendix 'G'

Integrated Transport Assessment

Molyneux Lifestyle Village Limited

Proposed Residential Plan Change
Alexandra

Transportation Assessment

CARRIAGEWAY
CONSULTING
traffic engineering | transport planning

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Main Report

Photographs

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CCL file reference	14706 alexandra ta draft 1
Status	Draft 1
Issued	9 April 2021

1. Introduction

1.1. Molyneux Lifestyle Village Limited proposes to lodge a private plan change to rezone an area of Rural-zoned land to facilitate the future development of up 62 large-lot residential properties, at a location towards the north of Alexandra ("*the site*").

1.2. This Transportation Assessment sets out a detailed analysis of the transportation issues associated with the proposed plan change including changes in travel patterns that are likely to arise from development of the site. Where potential adverse effects are identified, ways in which these can be addressed are set out.

1.3. This report is cognisant of the guidance specified in the New Zealand Transport Agency's '*Integrated Transport Assessment Guidelines*' and although travel by private motor vehicle is addressed within this report, in accordance with best practice the importance of other transport modes is also recognised. Consequently, travel by walking, cycling and public transport is also considered.

2. Site Overview

2.1. Location

2.1.1. The plan change site is located towards the immediate south of the Dunstan Road / Waldron Road intersection, towards the north of Alexandra. The site has frontage onto both of these roads. It is currently zoned as Rural Resource Area in the Central Otago District Plan (*'District Plan'*) and is currently used for rural activities.

2.1.2. The location of the site in the context of the local area is shown in Figure 1 and in more detail in Figure 2.

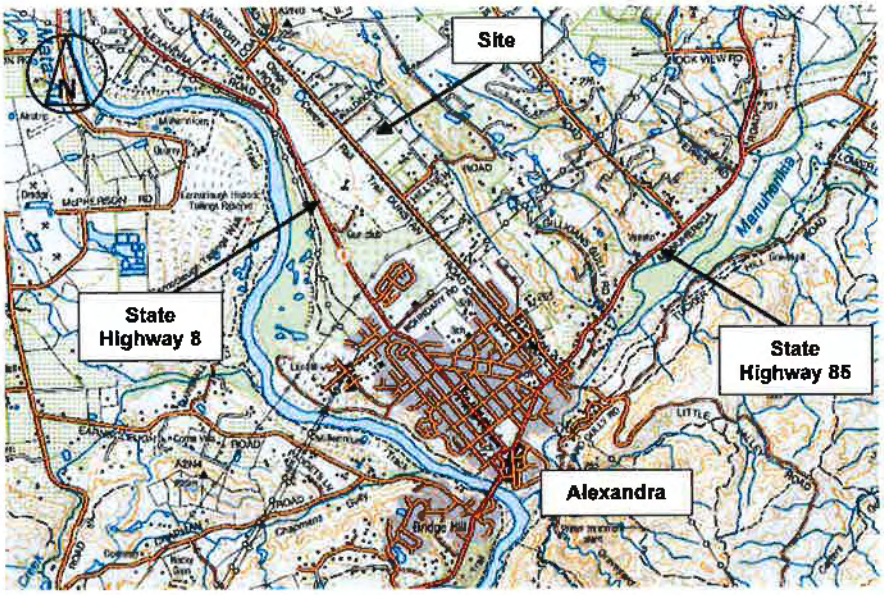

Figure 1: General Location of Plan Change Site

Figure 2: Aerial Photograph of Plan Change Site and Environs

2.2. *Roading Classification*

2.2.1. The District Plan classifies Dunstan Road as a Rural Arterial Road. On this basis, it is reasonable to conclude that the primary role of the road is to carry through traffic, with direct property access being limited.

2.2.2. Waldron Road is a Local Road, meaning it provides for local journeys and property access.

3. Current Transportation Networks

3.1. Roading Network

3.1.1. In the vicinity of the site, Dunstan Road is characterised by having a straight and flat carriageway, which is subject to a 100km/h speed limit. The traffic lanes are each 3.2m wide and the road has a 0.3m wide sealed shoulder. The carriageway is marked with a centreline, edge lines and has marked posts on each side. There are swales on each side. The legal width of Dunstan Road is in the order of 20m.

Photograph 1: Dunstan Road Looking South (Site on Left)

3.1.2. The location where the proposed site access is located is presently formed as a private driveway with stone walls on each side. The presence of the driveway enables an assessment to be easily made of the sight distances available in each direction.

Photograph 2: Existing Driveway Serving Site


Photographs 3 and 4: Sight Distances along Dunstan Road to Left and Right

3.1.3. The photographs show that sight distances in each direction are excellent.

3.1.4. Waldron Road lies on the northern side of the site. It has a legal width of 20m but is formed as a 4.5m wide unsealed carriageway. The Dunstan Road / Waldron Road intersection is formed as a priority intersection with no auxiliary turning lanes or seal widening.

Photograph 5: Dunstan Road / Waldron Road Intersection

Photograph 6: Dunstan Road Looking North (Site on Right)

3.2. Non-Car Infrastructure

3.2.1. The Central Otago Rail Trail lies to the immediate west of Dunstan Road and is separated from it by a landscaping strip of around 25m. The Rail Trail itself is around 4m wide and is gravelled.

Photograph 7: Rail Trail (Site on Right)

3.2.2. Other than the landscaping strip, there are no impediments to gaining access to the Rail Trail from Dunstan Road (and vice versa) and accordingly there is a network of informal routes through the landscaping (as can be seen on the right of the photograph above).

3.2.3. There is no specific provision for walking or cycling alongside the formed roads in the area. There is no public transport in the area.

3.3. Future Changes

3.3.1. There are no known changes to the roading environment in the immediate area that are set out in any overarching strategies or guides.

4. Current Transportation Patterns

4.1. Traffic Flows

4.1.1. According to the MobileRoad website, Dunstan Road carries 850 vehicles per day (two-way) with Waldron Road recorded as carrying 35 vehicles per day (two-way).

4.1.2. A road typically carries around 10% of its daily traffic flows in the peak hours. This suggests that the peak hour traffic flows on Dunstan Road and Waldron Road are around 85 and 3 vehicles per hour (two-way).

4.1.3. The Austroads Guide to Traffic Management Part 3 ('*Traffic Studies and Analysis*') sets out thresholds regarding the need for detailed traffic analyses at intersections, and the traffic flows below which detailed analyses of unsignalised intersections are unnecessary since the intersection operates under 'free-flow' conditions. An extract from this is replicated below.

Major Road Type	Traffic Volumes (Vehicles Per Hour)	
	Major Road	Minor Road
Two lane road	400	250
	500	200
	600	100

Table 1: Extract from Table 6.1 of Austroads Guide to Traffic Management Part 3 (Intersection Volumes below which Capacity Analysis is Unnecessary)

4.1.4. It can be seen that the volumes fall well below these thresholds, and accordingly, no analysis has been carried out. In essence, at present the roading network will operate under 'free-flow' conditions.

4.2. Non-Car Modes of Travel

4.2.1. Given that the area is predominantly rural, it can reasonably be expected that it will be relatively lightly used by pedestrians and cyclists. It is considered that the absence of infrastructure for these road users is therefore not unreasonable.

4.2.2. The exception to this is the Rail Trail, with conservative estimates of 15,000 users per year and up to 3,000 users per month[1] (March and April are the most popular months with little use during June, July and August).

4.2.3. There are no regular bus services that pass the site. Although several longer-distance services pass nearby on the highway, there are no bus stops provided within walking distance.

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1 https://www.codc.govt.nz/repository/libraries/id:2apsqkk8g1cxbyoqohn0/hierarchy/sitecollectiondocuments/reports/other-reports/Otago%20Central%20Rail%20Trail%20User%20Survey%20Analysis%202014-15.pdf

4.3. Road Safety

4.3.1. The NZTA Crash Analysis System has been used to establish the location and nature of the recorded traffic crashes in the vicinity of the site. All reported crashes between 2011 and 2020 were identified[2], plus the partial record for 2021, for Dunstan Road for 1km to the north and south of the site plus the full length of Waldron Road.

4.3.2. This showed that there have been three crashes recorded:

- around 700m south of the site (at Hillview Drive), one crash occurred when a northbound truck driver was overtaking a scooter rider who then turned right across the path of the truck. The crash resulted in serious injuries;
- around 400m south of the site, one crash occurred when a northbound truck driver overtook a car in front that was moving slowly, but the car then turning right, across the path of the truck. The crash resulted in minor injuries;
- around 150m north of the site, one crash occurred when a northbound driver experienced sunstrike, swerved to avoid a perceived obstruction, and lost control of their vehicle. The crash resulted in minor injuries;

4.3.3. The historic pattern of crashes does not indicate any particular safety-related deficiencies on this part of the roading network.

[2] A ten-year period has been used due to the traffic volumes on Dunstan Road being below 1,000 vehicles per day.

5. Proposal

5.1. The proposed plan change will facilitate the development of up to 62 large-lot residential dwellings.

5.2. Since the proposal is for a plan change, it is understood that there is no confirmed scheme plans for the area. However a Structure Plan has been produced, as shown below.

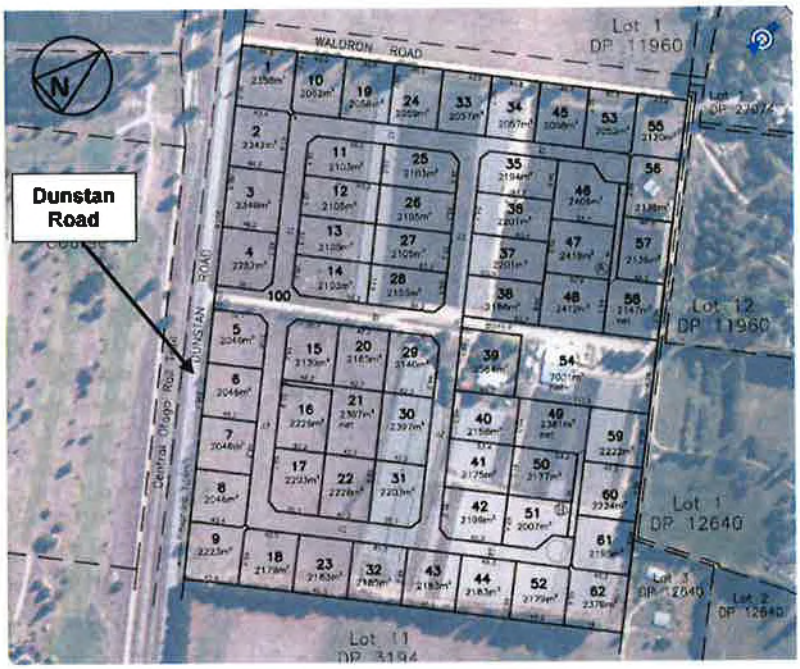

Figure 3: Structure Plan for Site (Extract from Paterson Pitts Drawing)

5.3. It can be seen that access onto the roading network is proposed to be gained onto Dunstan Road, in the location of the existing driveway. The access road will serve a loop road located approximately centrally within the site, but with two small cul-de-sacs to the northeast and southeast.

6. Traffic Generation and Distribution

6.1. Traffic Generation

6.1.1. Traffic generated by residential developments is known to vary for a variety of reasons, with one such reason being the proximity (or otherwise) to employment and community facilities. Where a dwelling is some distance from these types of facilities, the traffic generation rates tend to be lower than for residences that are closer due to 'trip chaining', that is, the tendency of a resident to carry out multiple visits to different destinations during the same trip away from the dwelling.

6.1.2. In this case, it is likely that traffic will be associated with employment locations in Alexandra or further afield in Cromwell, and there is also likely to be travel to schools in Alexandra. As Alexandra is less than 3km away, for this analysis a rate of 8 vehicle movements per day per residence has been used, with 1 vehicle movement per residence occurring in each of the peak hours.

6.1.3. In the morning peak hour, 85% of these vehicles are likely to be exiting the site, with 65% of the generated vehicle movements entering the plan change site in the evening peak hour.

6.2. Trip Distribution

6.2.1. With regard to the distribution of these vehicles, it is anticipated that the vast majority will be associated with travel to/from Alexandra and therefore for the purposes of this analysis, an allowance has been made for 90% of vehicles to travel to/from the south.

7. Effects on the Transportation Networks

7.1. Roading Capacity

7.1.1. Based on the traffic flows above, the increases due to development of the site will be:

- Daily Traffic Volumes:
  - Dunstan Road (south of site) prior to plan change: 850 vehicles (two-way)
  - Dunstan Road (south of site) after plan change: 1,296 vehicles (two-way)
  - Dunstan Road (north of site) prior to plan change: 850 vehicles (two-way)
  - Dunstan Road (north of site) after plan change: 900 vehicles (two-way)
- Peak Hour Traffic Volumes:
  - Dunstan Road (south of site) prior to plan change: 85 vehicles (two-way)
  - Dunstan Road (south of site) after plan change: 141 vehicles (two-way)
  - Dunstan Road (north of site) prior to plan change: 85 vehicles (two-way)
  - Dunstan Road (north of site) after plan change: 91 vehicles (two-way)

7.1.2. These volumes are still well within the capacity of the roads. The heaviest flow of 141 vehicles per hour equates to just one vehicle movement every 15 seconds.

7.1.3. No modelling has been undertaken for the proposed access between the plan change site and Dunstan Road. Given that the volumes on both roads will be low, the thresholds set out in the Austroads Guide will not be met and the intersection(s) will operate under free-flow conditions.

7.1.4. Overall then, the traffic generated by full development of the plan change site can easily be accommodated on the road network.

7.2. Non-Car Modes of Travel

7.2.1. The development of the site may result in increased levels of walking and cycling in the immediate area. These will only be moderate because of the scale of development.

7.2.2. It is typically accepted that people will walk a maximum of 1km to reach a particular destination, and will cycle a maximum distance of 3km. In this regard, there are few destinations within 1km, but in practice, the Rail Trail provides a high-quality and largely off-road connection of less than 3km to The Terrace primary school and Dunstan High School, as well as to the leisure facilities at Molyneux Park. There are also a number of employment opportunities towards the south (for instance at Ngapara Street) which also lies within 3km of the site.

7.2.3. The size of the subdivision is not sufficient that it will give rise to the need for a public transport service.

7.3. Road Safety

7.3.1. Based on a review of the road safety records, the proposal is unlikely to result in adverse road safety effects arising as a result of the increase in traffic flows on the road network.

7.3.2. The location of the access into the site (as shown on the Structure Plan) means that sight distances towards the north and south well in access of 300m are available, which exceeds the minimums required for the prevailing speed limits.

7.4. Dunstan Road Cross-Section

7.4.1. Development of the site will increase traffic flows on Dunstan Road. As noted above, the traffic lanes are a total of 6.4m wide and the shoulders are 0.3m wide. The Council's Engineering Code of Practice does not specify a width for a Rural Arterial Road as it only goes as far as a Collector Road. However since it also states that roads with an AADT of more than 2,500 vehicles per day requires a specific design, this implies that roads of less than 2,500 vehicles per day do not require specific design and therefore that the Code of Practice can be used.

7.4.2. The highest specification of road is shown with a 7.0m carriageway width and 0.25m wide shoulders. The existing road is therefore of a lesser standard than required under the Code of Practice.

7.4.3. The proposal will result in traffic flows increasing by around 500 vehicles per day. The resultant daily traffic remains below the threshold of 2,500 vehicles where specific design is required, suggesting that the same cross-section of road is required after development of the site, of a 7.0m carriageway and a 0.25m shoulder.

7.4.4. In view of the road reserve width available and the favourable topography, this widening can easily be accomplished. However it is considered that the need for this widening should be assessed and confirmed when land use and/or subdivision consents are sought, since in practice, the increase in traffic relates to just one additional vehicle movement per minute at the very busiest of times, which can be easily accommodated within the existing formation.

7.5. Site Access

7.5.1. The proposal will create a priority intersection on Dunstan Road. The width of the legal road means that there is no impediment to achieving an intersection layout that meets relevant guides and standards. Sight distances are excellent, as shown on Photographs 3 and 4 above.

7.5.2. At the busiest time there could be up to 36 vehicles turning right into the site. Under the warrants set out in the Austroads Guide to Traffic Management Part 6 ('Intersections, Interchanges and Crossings'), and taking into account the through traffic on Dunstan Road, a n auxiliary right-turn lane is not required. Similarly, the traffic flows do not warrant an auxiliary left-turn lane at the access.

7.5.3. The proposal will also lead to an increase in crossing movements of Dunstan Road associated with cyclists, and potentially some pedestrians, accessing the Rail Trail. Sight distances between all road users are excellent but the high speed limit on Dunstan Road means that in the event of any collision, it is likely that injuries will be serious. However as with any other new roading infrastructure, it can be expected that a road safety audit will be carried out of the detailed design, and this will include addressing matters relating to walking and cycling. The legal width of Dunstan Road is such that measures can be introduced to support crossing movements at that time, such as a formally marked crossing location or a pedestrian refuge.

7.5.4. The proposed site access is located 220m from Waldron Road (measured centreline to centreline). The Council's Engineering Code of Practice adopts Standard NZS4404:2004, with the latter setting out that "*the separation between any two roads intersecting a road of local distributor class or high than this class shall be a minimum distance of 150m centreline to centreline*" (paragraph 3.3.7). This separation is therefore achieved by the Structure Plan.

8. Statutory Framework

8.1. Introduction

8.1.1. There are a number of statutory documents that are relevant to plan change requests. These are discussed in detail below, together with an assessment of whether the plan change request aligns with the strategic guidance given.

8.2. Otago Regional Land Transport Plan 2015-2021

8.2.1. The purpose of the RLTP is to "*set our vision of transport in the future and how intend to achieve this by funding and providing transport services and infrastructure*". The June 2018 update of the document also adds "*...and by concentrating over the next few years on achieving a safer and more sustainable transport system that supports and enhances regional development*".

8.2.2. The key long-term strategic objectives are:

- A transport system that is safe;
- A transport system that delivers appropriate levels of service;
- A transport system that supports economic activity and productivity;
- A transport system that provides appropriate transport choices;
- A transport system based on effective coordination; and.
- Mitigating the effects of the transport system on the environment

8.2.3. The traffic generated by development of the site can be accommodated on the roading network with appropriate levels of service, and there are no reasons to anticipate that adverse road safety effects would arise as discussed further above. The location of the site is within 3km of a number of likely destinations (employment, schools and leisure facilities) meaning that cycling is a practical option. This route would largely be on the Rail Trial and separated from vehicle movements.

8.2.4. If there was to be a local bus network within Alexandra in future, then it is possible than Dunstan Road could form parr of a route. This would therefore result in the site being accessible by public transport.

8.3. Otago Regional Public Transport Plan 2014

8.3.1. This Plan focusses on areas with higher numbers of residents, specifically the Wakatipu Basin and Dunedin. As such, there is little mention made of Alexandra or surrounding areas. However the plan change request does not preclude the ability to implement public transport in future.

8.4. Central Otago District Plan

8.4.1. The District Plan sets out a number of transportation-related rules with which any development is expected to comply. Although the proposal is for a plan change, consideration of these rules is important at this stage in order to identify whether the plan change provisions should seek to exempt development from any rules, or conversely, to introduce new rules specific to the zone.

8.4.2. Consequently an assessment of the plan change provisions against these rules has been undertaken and the results are summarised below

8.4.3. District Plan Part 12.7.1: Access Standards from Roads: Part (ii): Sight Distances

8.4.3.1. Under the District Plan, assuming that roads within the site are subject to a speed limit of 50km/h (being typical for a residential subdivision) then each lot requires a sight distance of 40m at its access. This can be achieved through careful site layout design, as the Structure Plan shows that lots typically have a frontage of at least 33m onto any of the internal roads.

8.4.4. District Plan Part 12.7.1: Access Standards from Roads: Part (iii): Access to Rural Arterial Roads

8.4.4.1. This part of the District Plan requires accesses to be constructed to particular layouts. However it is unlikely that there would be direct accesses onto Dunstan Road due to the presence of the internal network which provides a lower speed environment and thus reduces the potential road safety risk. Also under these provisions, as the speed limit on Dunstan Road is 100km/h, there needs to be a spacing between accesses of at least 200m which could not be achieved in view of the size of the lots.

8.4.5. District Plan Part 12.7.2: Parking: Part (i): Number of Spaces

8.4.5.1. At this stage, no detailed layout has been produced for the individual lots. However their likely size means that each will be able to provide several car parking spaces, meeting Plan requirements.

8.4.6. District Plan Part 12.7.2: Parking: Part (ii): Parking in Excess of Three Spaces

8.4.6.1. It is not expected that any lots will provide more than three parking spaces.

8.4.7. District Plan Part 12.7.3: Loading and Manoeuvring: Part (i): Servicing Activities

8.4.7.1. The proposal is for residential activities and therefore the loading and unloading of goods is not expected to occur frequently.

8.5. Council's Engineering Code of Practice

8.5.1. The Council has a Code of Practice which sets out appropriate widths for the internal roads within the plan change site. It is not considered that there are any reasons why these could not be met. If it is proposed to deviate from the Code of Practice, an application would need to be made and considered at the appropriate time.

8.6. Summary

8.6.1. It is considered that the plan change request is aligned with the strategic objectives of the Otago Regional Land Transport Plans 2015-2021, as relevant to this particular area. The Otago Regional Public Transport Plan is not particularly relevant due to the focus on other areas, but the plan change request is not contrary to it.

8.6.2. The site layout is likely to be able to comply with all the transportation requirements of the District Plan.

8.6.3. In view of the situation, it is not considered that the plan change proposal needs to include any specific transportation-related Rules. Rather, the existing Rules of the District Plan are appropriate, and resource consent applications can be made in the event that the detailed site layout design introduces non-compliance with these.

9. Conclusions

9.1. This report has identified, evaluated and assessed the various transport and access elements of a plan change request for large-lot residential activities (facilitating up to 62 lots) at Alexandra.

9.2. Overall it is considered that the traffic generated by the development of the plan change site can be accommodated on the adjacent roading network without capacity or efficiency issues arising. In practice, the traffic flows on Dunstan Road are very low at present, and development of the site generates relatively little traffic, meaning that the proposed site access will operate under 'free flow' conditions, and Dunstan Road remains operating well within its maximum capacity.

9.3. The crash history in the vicinity of the plan change site does not indicate that there would be any adverse safety effects from the proposal. Dunstan Road is flat and straight and therefore sigh distances at the proposed site access will be excellent.

9.4. The internal roads within the site are likely to be able to comply with the Council's standards. Dunstan Road itself presently does not comply with the Council's Engineering Code of Practice, as the carriageway is 6.4m wide rather than the 7.0m width expected under the Code. However in practice the development of the site generates only one additional vehicle movement on the road network at the very busiest of times, and Dunstan Road is already lightly-trafficked, meaning that in practice the current carriageway width will function adequately.

9.5. Although there is presently only a Structure Plan proposed, it is likely that there will be a high degree of compliance with the transportation requirements of the District Plan and at this stage no non-compliances are expected. The plan change is also aligned with overarching strategic documents for the area

9.6. Overall, and subject to the preceding comments, the plan change request can be supported from a traffic and transportation perspective and it is considered that there are no traffic and transportation reasons why the plan change could not be approved.

Carriageway Consulting Limited
April 2021

CARRIAGEWAY
CONSULTING

traffic engineering | transport planning

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Appendix 'H'

Soil Contamination Assessment

Project Number: 6-XZ371.00

269 Dunstan Road, Alexandra

Detailed Site Investigation Report
Molyneux Lifestyle Village Ltd

11 December 2020

wsp

150 YEARS IN AOTEAROA

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Work Group Manager Geotechnical & Environmental

Document History and Status

Revision	Date	Author	Reviewed by	Approved by	Status
1	11/12/2020	EH	LAB	RB	Final

Revision Details

Revision	Details
1	Amended to reflect new development proposals and availability of background concentrations

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Appendices

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Disclaimers and Limitations

<<insert here>>

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Executive Summary

Molyneux Lifestyle Village Ltd (herein referred to as 'the Client') commissioned Opus International Consultants Ltd (Opus) to undertake a Detailed Site Investigation (DSI) for a piece of land located at 269 Dunstan Road (herein referred to as 'the site'). The site is proposed to be subdivided with land use change and ground disturbance.

Prior to this commission CPG had undertaken a Preliminary Site Investigation (PSI) with preliminary sampling and analysis of the property in order to give an indication of the risks to human health and the environment. The findings of the PSI indicated that the site investigated, which constitutes part of the subject site, is currently suitable for rural residential living, inclusive of consumption of up to 25% of dietary produce from produce grown on site with respect to NES SGVs.

This DSI assessment has been undertaken to further investigate the remainder of the site and to supplement and confirm the existing CPG report findings; subsequently addressing the requirements of Central Otago District Council (CODC) for a Land Use Change in accordance with the provisions of the National Environmental Standards (NES) regarding subdivision of potentially contaminated land.

A Detailed Site Investigation programme was undertaken on 7th and 10th June 2017, by an Opus SQEP. Soils samples were taken from near surface soils to depths of up to 300mm. Sample locations were determined by the SQEP prior to commencement of site works and were located randomly within a grid basis to cover all areas of the site, filling in gaps of analytical data gained from the PSI. The results of both the PSI investigation and the subsequent DSI are included within this report.

Thirty five samples of soil were taken as part of this investigation, with samples from within the vineyard composited on a 2:1 basis for analysis, along with four samples from previous investigations.

Results from these screening analyses have initially been compared against soil guideline values (SGVs) from the National Environmental Standards (NES) Appendix B: Soil Contaminant Standards. Chemical analysis results have revealed no elevated concentrations of heavy metals, PAH's, MAH's and pesticides within the near surface soil sampled. In addition, with the exception of C10 – C14 within one sample, TPH's were not encountered in elevated concentrations across the remainder of the site. It should be noted that this result was not unexpected as S19 was collected at 0.20m bgl in an area situated directly below the above ground fuel tank located on the site. A landfill/waste disposal pit was noted on the eastern side of the site which will require remedial measures should development of this area be undertaken. The remaining site area is considered suitable for rural residential purposes. As such, it is considered highly unlikely that there is a risk to human health should the proposed residential activity be undertaken on the proposed residential subdivisions of the site.

Remedial options for the fuel tank area include doing nothing if the land use in the vicinity of the above ground fuel tank is to remain unchanged and localised site stripping with associated validation testing if there is a proposed land use change and ground disturbance within the vicinity of the fuel tank. The merits of each option are discussed in more detail within the conclusion of this report.

1 Introduction

Molyneux Lifestyle Village Ltd (herein referred to as 'the Client') commissioned Opus International Consultants Ltd (Opus) to undertake a Detailed Site Investigation (DSI) for a piece of land located at 269 Dunstan Road (herein referred to as 'the site').Since that commission the plans for the development site have changed and this report, completed by WSP New Zealand Ltd, includes the amendments for the proposed site layout. The Site is proposed to be subdivided with a land use change and ground disturbance providing the development with residential living in a rural setting.

Prior to this commission CPG had undertaken a Preliminary Site Investigation (PSI) (Job number: 705652 16 April 2012) with preliminary sampling and analysis of the property in order to give an indication of the risks to human health and the environment. The CPG report did not investigate the whole of the site; their report only investigated the southern quadrant an area used to dispose of winery wastewater (herein referred to as 'the CPG site). The findings of the PSI indicated that the portion of the site investigated is currently suitable for rural residential living, inclusive of consumption of up to 25% of dietary produce from produce grown on site with respect to NES SCVs.

This DSI assessment has been undertaken to further investigate the remainder of the site and to supplement and confirm the existing CPG report findings in order to address the requirements of Central Otago District Council (CODC) for a Land Use Change in accordance with the provisions of the National Environmental Standards (NES) regarding subdivision of potentially contaminated land.

1.1 Objectives

This report has been prepared in order to assess the potential for ground contamination across the site and to supplement and confirm the existing CPG report findings. The presence of vineyard activities on site indicates that the site is considered to be within the remit of the National Environmental Standards (2011), Appendix C – Hazardous Activities and Industries List (HAIL) namely:

A10: Persistent pesticide bulk storage or use including sport turfs, market gardens, orchards, glass houses or spray sheds.

As such the following objectives have been identified:

- Determine whether potentially contaminating activities have been undertaken on the site or its surrounds;
- Assess the potential risk of these activities to affect human health or the environment, particularly within the surrounds of the proposed development area;
- Assess whether further assessment or action is required with respect to the risks assessed;
- Determine the likely impact upon sensitive receptors including site users, occupiers and construction workers on site; and
- Provide recommendations where appropriate.

1.2 Scope of Work

In order to achieve the objectives set out above the following scope of works was undertaken:

- Review of all Preliminary Site Investigation data and findings;

- A site investigation comprising near surface soil sampling in order to provide additional information regarding the soil chemistry with respect to heavy metals, pesticides, and hydrocarbon concentrations at the site;
- Characterisation of the soils taking in to consideration the findings of nearby investigations to determine the risk to human health and the environment.
- Characterisation of the site in line with NES guidance.

2 Previous Investigation Summary

In May 2012 CPG carried out a PSI on 4.5 hectares of land at 269 Dunstan Road, Alexandra on behalf of SBS Bank in order to determine whether contaminants were present at levels high enough to warrant further action subject to being suitable for subdivision. The investigation carried out by CPG relates to the southern quadrant of the site being investigated in this DSI. A summary of the report corresponding to this investigation is given below.

2.1 Background Information

Located at 269 Dunstan Road, Alexandra the CPG site is listed on Central Otago District Council files under identifiers OT5B/1024 and OT5B/1025 and is zoned rural residential.

The land was first leased to William Hill Grant in 1960, and has been occupied and managed by the Grant family to the present day. A winery has been run on part of the land adjacent to the CPG site since 1973, the CPG site itself has not seen significant use during this time. For a period, the cultivation of asparagus, was trialled before being discontinued. Intermittently, sheep have been allowed to graze on the land. Since 2003 the site has been used to discharge winery wastewater (ORC consent 2003.384) and to dispose of grape peels and seeds.

Due to a past land use for waste disposal activities, the site may be interpreted to be a HAIL site (Hazardous Activities and Industries List site). As the waste that has been recently disposed to land at the site is a product of agricultural activity, potential contaminants are similar to that which might be anticipated from historical agricultural activities, i.e. pesticides, heavy metals and impurities that might be present in certain soils. Whilst there is some potential for the disposal of winery wastewater to land to cause contamination, the probability of this is low as the waste generated by the winery is primarily constituted of materials that are intended for human consumption. Additionally strong corrosive cleaning agents are reportedly not used.

Furthermore, the site has only been very marginally and sporadically cultivated, thus the present and recent potential for agrichemical accumulation and persistence is low. While grapes are grown on adjacent land, a few rows of which overlap onto the site boundary, it was noted that the grape growing operation is GrowSafe certified. GrowSafe is a scheme that trains people to apply agrichemicals in a safe, responsible and effective way with minimal adverse impact on human, environmental and animal health.

The ground surface at the CPG site and its immediate surroundings is flat. The area on which the CPG site is situated overlies a geological basement that is primarily composed of a schist/Tertiary mudstone that is overlain by sandy gravels and mixed glacial and alluvial deposits.

There is no surface water at the site; the site is close to the Clutha River, which lies just on the other side of the golf course that is immediately opposite the CPG site, across Dunstan Road to the west. Rainfall averages 350 mm/year, much of which reaches the Dunstan Flat sub-aquifer underling the site, depth to groundwater is highly variable, and most likely to be 1-3m.

2.2 CPG Results and Recommendations

Four samples were taken and then combined prior to testing as a composite sample for heavy metals and pesticide residues. Due to the use of composite sampling the soil guideline values (SGV) are divided by the number of samples composited resulting in adjusted soil guideline values (ASGV). The analysis of the composite sample resulted in all determinands being below the ASGV apart from an arsenic concentration of 7mg/kg which was higher than the ASGV of 4.3 mg/kg resulting in a technical exceedance for arsenic.

As such further investigation was warranted and the four individual samples were individually tested for arsenic, in order to determine any individual exceedances above the SGV. The results categorically confirmed that the arsenic concentrations in all of the samples tested were well

below the SGV of 17mg/kg as the highest result was 8mg/kg in Sub-sample 2, as such there were no exceedances of the SGV across the CPG site tested. CPG determined that the levels of arsenic detected are noted to probably arise due to a slightly elevated baseline value originating from the weathered schists found throughout the area.

In summary there was no evidence of HAIL activity or previous investigations and as no contaminants were found at levels above SGVs, and by this criterion the CPG site is not deemed to be contaminated. As such the PSI report concluded that the CPG site is currently suitable for rural residential living, inclusive of consumption of up to 25% of dietary produce from produce grown on site with respect to NES SGVs.

Based on the results obtained in this investigation CGP recommended that this report be provided to the Otago Regional Council with a request for a status update reflecting that the CPG site has been investigated with regards to being a potential HAIL site, with a negative result.

3 Site Identification and Description

3.1 Location and Description

The site is located at 269 Dunstan Road, Alexandra, as shown on the Site Location Plan in Figure 1.

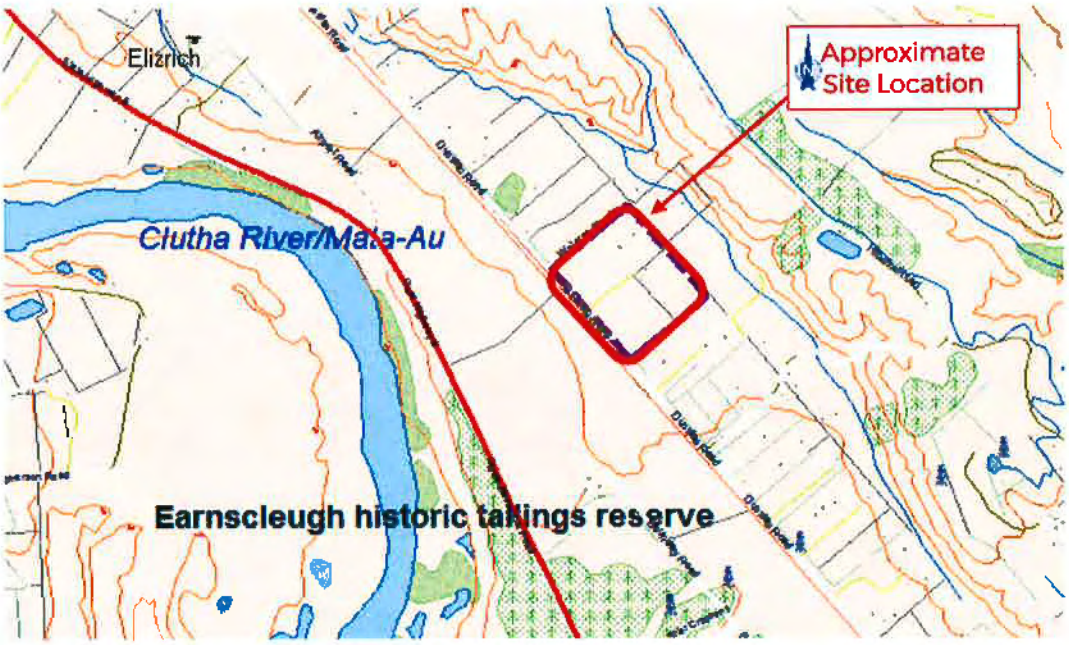


Figure 1: Site Location Plan

The site comprises four land parcels legally described as

- Pt Lot 13 Deposited plan 3194 (Certificate of Title OT5B/1137) ~4.05ha. Owned by William Hill Holdings Limited.
- Pt Lot 13 Deposited plan 3194 (Certificate of Title OT5B/1138) ~4.25ha. Owned by William Hill Holdings Limited.
- Pt Lot 12 Deposited plan 3194 (Certificate of Title OT5B/1024) ~4.17ha. Owned by David James Grant.
- Pt Lot 12 Deposited plan 3194 (Certificate of Title OT5B/1025) ~4.06ha. Owned by William Hill Holdings Limited.

The site has a total approximate area of 16.5ha.

Adjacent land uses to the site generally comprise rural residential land, lifestyle blocks with Dunstan Road immediately bounding the west of the site. At its closest point the site is located 550m east of the Clutha River.

Details of the land surrounding the site are shown on the Quickmap plan in Figure 2.

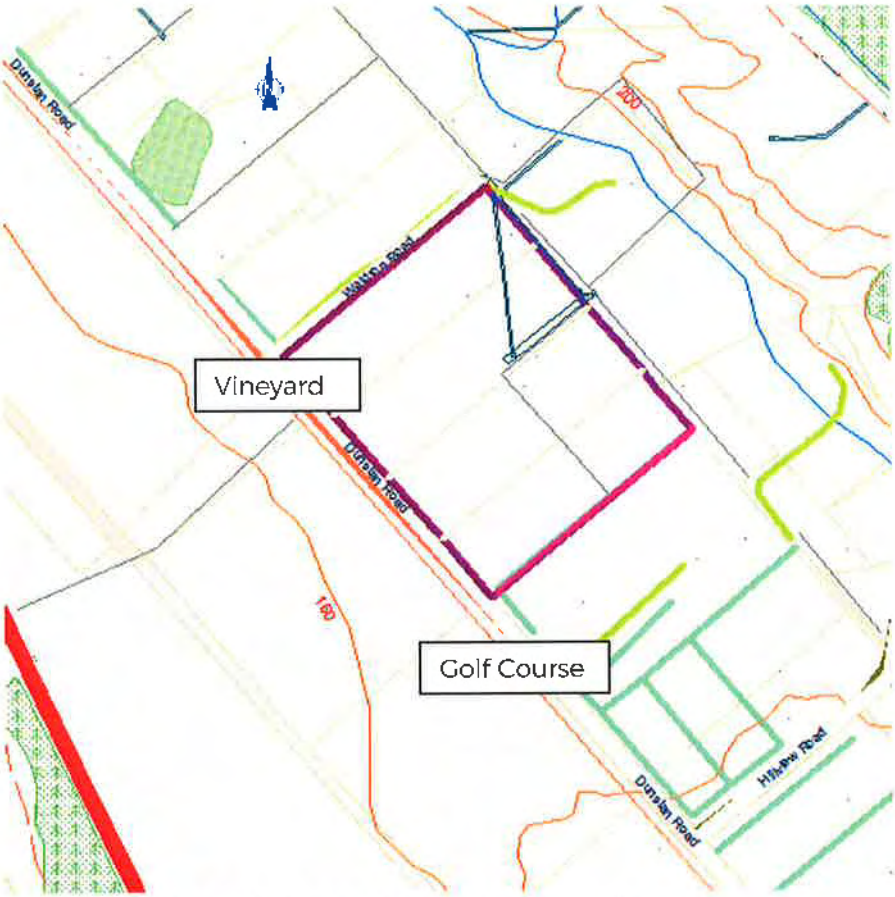


Figure 2: Quickmap plan of site and surrounds

3.2 Geology and Hydrogeology

The geology of the site is shown on the 1:250,000 scale GNS Geology Web Map extract (accessed July 2017) as shown in Figure 3.

This map indicates the site to be underlain by the Albert Town Advance superficial deposits comprising Late Pleistocene outwash deposits unweathered to weathered loose sandy to silty well rounded gravel, usually on large outwash plains. Basement geology consists of the Caples Group a well foliated schist with common quartz veins[1].

Naturally occurring arsenic bearing rocks associated with Otago Schist are well publicised[2] with weathering of natural rocks along with human mining activities in the area potentially allowing transportation of mineral rich debris across the area.

A review of the GNS Active Faults Database indicates that the nearest active fault, the Damsite Fault, lies some 7.5km north west of the site, as shown in Figure 4. This sinistral fault is described to have an unknown slip rate with a recurrence interval of between 5,000 and 10,000 years.

The property is located within the Dunstan Flats Aquifer catchment which was noted to have good water quality[3].

[1] http://www.orc.govt.nz/Publications-and-Reports/Research-and--Technical-Reports/Groundwater/Alexandra-Basin-Allocation-Study/
[2] Craw & Pacheco (2002). Mobilisation and bioavailability of arsenic around mesothermal gold deposits in a semiarid environment, Otago, New Zealand
[3] http://www.orc.govt.nz/Publications-and-Reports/Research-and--Technical-Reports/Groundwater/Alexandra-Basin-Allocation-Study/

All surface water flow in the area follows the general topography in a general south-westerly direction towards the Clutha River which is in hydraulic continuity with the aquifer.

Grow Otago[4] rainfall data indicated an annual median rainfall of between 351-400 mm in the vicinity of the site with a median annual potential evaporation of around 100 mm. However, the extremely well drained soils on the site indicate that the site typically has a water deficit prior to any irrigation measures.

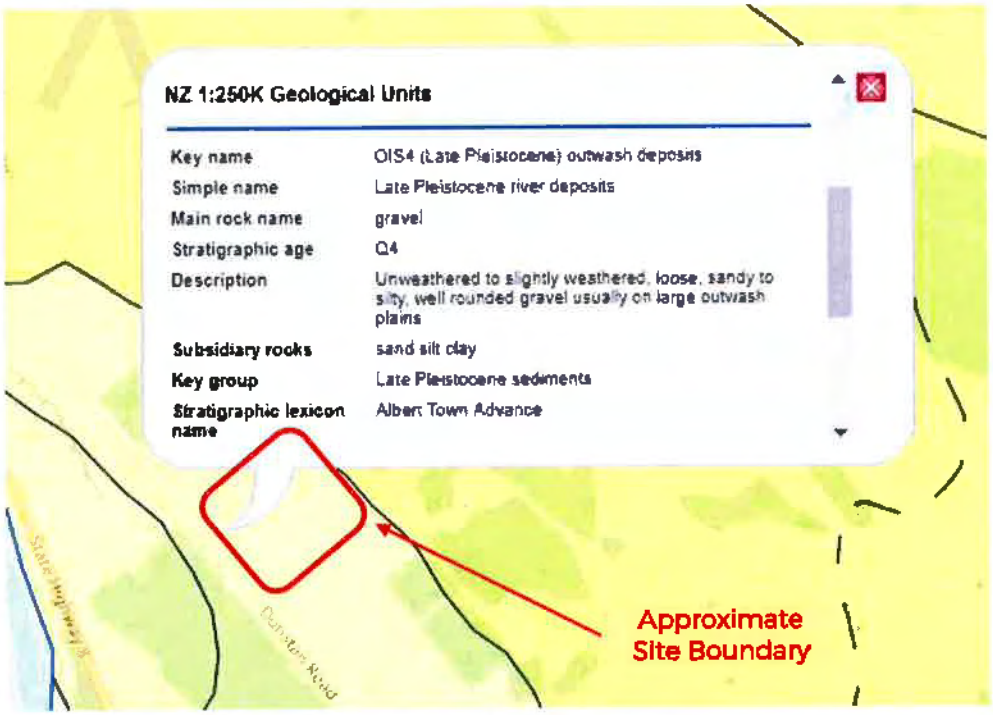


Figure 3: Geological Extract of the GNS Geology Web Map

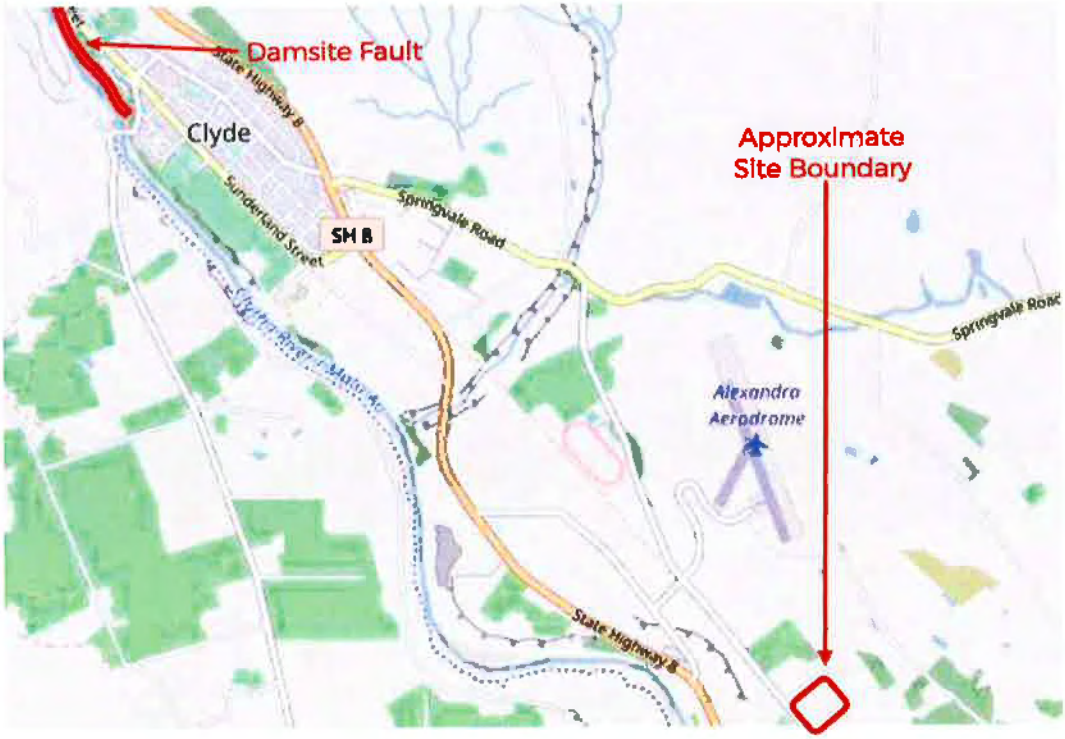


Figure 4: Extract from GNS Active Faults Database

[4] http://growotago.orc.govt.nz/

3.3 Site History

A review of available aerial photographs has indicated that vines have been located on the site since at least 2005.

Details of the site history contained within the Preliminary Site Investigation report prepared by CGP for part of the site indicates that from the 1960 up until its sale earlier this year, the land was leased to the Grant family and used as a winery on the eastern part of the site while the remaining land, currently pasture, has intermittently cultivated or been grazed. Since 2003 this land has been used to discharge winery wastewater (ORC consent 2003.384) as well as disposal of grape peels and seeds.

The CPG report also indicates that the vineyard is currently certified as GrowSafe under the New Zealand Agrichemical Education Trust (NZAET). The vines are currently not tended or harvested for winemaking.

Historical information is presented in Appendix B.

3.4 Land Use Database

A review of CODC's District Plan Maps indicates that the piece of land lies within a Rural Resource Area.

From information available on CODCs eDocs website (accessed July 2017), it is evident that the site has previously been subject to seven resource consent applications, as detailed in Table 1.

Table 1: Consent applications for the site

DATE	DETAILS OF CONSENT APPLICATION
1993	Additions/implement shed – consent issued
1998	Additions to winery – consent issued
2000	Installation of woodsman ds80 – consent issued
2000	Erect toilet/changing room – consent issued
2002	Additions to winery – consent issued
2005	Install a new diesel fire appliance – consent issued
2005	Erect shed garage/workshop – consent issued

In addition a single resource consent was issued in 2014 giving subdivision consent.

3.5 Site Inspection

A site inspection was undertaken on the 6th July 2017 by an Opus (now WSP) SQEP. Details of the inspection are outlined below with a site plan presented within Appendix B and a selection of site photographs presented within Appendix C.

The Detailed Site Investigation site visit was completed on 7th and 10th June 2017 by an Opus SQEP. Samples of near surface soil were taken during this site visit for soils analysis.

During both site visits, the site was accessed off Dunstan Road via a gate and track in the centre of the site. The topography of the site was generally flat. However, a number of tracks were noted to crisscross the site presumably used to move equipment around the site.

The northern and eastern sections of the site were covered with vines and overgrown grasses. To the south and west there is rough pasture, while a number of buildings including a residential

building are located in the centre of the site, with a chemical storage shed situated on a concrete pad located along the eastern boundary in the southern portion of the site.

At the time of the site inspection and walkover no chemicals were noted in this area, it is understood that the vineyard has not been operational for some time. A number of empty plastic containers and storage tubs were noted alongside the shed and garage area on the southern part of the site, however no visible or olfactory signs of contamination was noted around the storage area. An above ground fuel tank was also noted in the centre of the site, a petrochemical odour is identifiable in this area. In the southern portion of the site a waste pit is easily identified, the primary use of this pit is to burn rubbish.

During both of the site inspections no obvious signs of contamination were noted, nor were any signs of vegetation dieback encountered.

Topsoil encountered on the site was noted to comprise a non- cohesive silty sand with abundant sub rounded to rounded gravel and cobbles.

4 Proposed Development

The Client proposes to develop a number of subdivisions and associated land use change across the 16.5 ha piece of land with a minimum lot size of 2007m^2 and a maximum lot size of 7001m^2. It is understood that the existing house and winery will remain on the site.

It is understood that resource consent is being sought for these subdivisions. A copy of the proposed development plan is attached within Appendix D.

5 Conceptual Site Model

This section of the report relates to the assessment of contamination arising from the previous and current site conditions, both on and off the site that may impact on the proposed subdivision and land use change.

5.1 Source-Pathway-Receptor Assessment

5.1.1 Potential Sources of Contamination

Potential of sources of contamination on the site are likely a result of current and historical viticulture activities on the site along with the above ground fuel tank. No spray records were available for the site, however it can be assumed that a standard range of agrochemicals was used across the site prior to its last crop in 2004. As such potential sources of contamination are likely to include:

- Organochlorine, organo-nitrate pesticides;
- Heavy metals including arsenic: and
- Hydrocarbons.

5.1.2 Pathways

Plausible pathways such as inhalation, dermal contact, ingestion, leaching, and migration of contaminated groundwater, migration of ground gases and hazardous vapours as well as aggressive attack on construction materials have all be considered as part of the development of the conceptual site model for this site.

The most plausible pathways for contaminant migration associated with this site are therefore considered to be:

- Inhalation of contaminated dust;
- Dermal Contact with contaminated soils/water;
- Ingestion of contaminated material or food; and
- Leaching of contaminants through the soil matrix.

5.1.3 Potential Receptors

Considering the environmental setting of the site and the potential sources of contamination, the most sensitive receptors on the site have been identified as being end-users of the site such as future occupiers and residents (via direct contact with contaminated soils and direct ingestion pathways) and construction workers (via direct contact, ingestion and inhalation of dusts created during ground works).

Environmental receptors include groundwater and surface water. These have been taken into account when undertaking the preliminary risk assessment for the site, although are not the focus within the requirements for assessment of the National Environmental Standards (NES) in terms of risk to human health from soil borne contamination.

Using the data obtained from this report a preliminary Conceptual Site Model has been derived for the site and is presented in Figure 5.

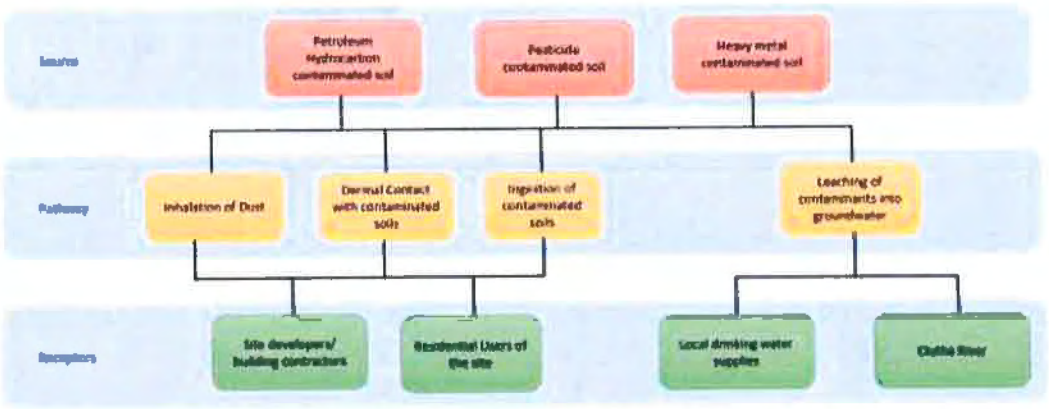


Figure 5: Conceptual Site Model

5.2 Preliminary Risk Assessment

For sensitive receptors to be at risk from identified sources of contamination a plausible linkage or pathway must exist. The site is known to have been sprayed with various agrochemicals in a controlled and managed manner.

Chemicals which are likely to have been applied to the vineyard would more likely than not have been subject to dilution and infiltration in to the ground since the last application due to rainfall. However in areas where chemicals were mixed or stored higher concentrations may have been leached in to the near surface soil environment.

Both anthropogenic and geogenic sources of contaminants need to be taken in to account as part of this preliminary risk assessment.

Due to the presence of large machinery, vehicles, and an above ground fuel tank as well as the periodical burning of rubbish on site, there is a potential risk of hydrocarbon contamination in these areas and is associated with spills and leaks. However it is anticipated that any potential hydrocarbon contamination will be confined close to the source of contamination. Nevertheless there is the potential for more widespread contamination associated with the burning of waste due to distribution by the wind.

In order to further quantify the potential risks posed from historic pesticide use and localised hydrocarbon spillages, a detailed site investigation was undertaken across the site in order to provide an overview of the potential for pesticide and heavy metal contamination associated with the primary contamination sources identified. In addition a number of samples will target areas associated with potential hydrocarbon contamination.

6 Detailed Site Investigation

6.1 Investigation Design Strategy

A Detailed Site Investigation programme was undertaken on 7th and 10th July 2017, supervised by an Opus (now WSP) Engineer. Soils samples were taken from near surface soils to depths of up to 300mm. Sample locations were determined by the SQEP prior to commencement of site works and were located randomly within a grid basis to cover all areas of the site, filling in gaps of analytical data gained from the PSI.

The location of samples taken was determined on site by the Engineer using a judgemental sampling programme taking into account the initial findings of the PSI searches and an assessment of the site at the time of the visit. A plan showing the soil sampling locations is presented in Figure 6.

Sampling of the soils was undertaken using industry standard methods and protocols to avoid cross contamination of the samples, including but not restricted to the use of clean gloves for each sample taken, decontamination of the stainless steel trowel using appropriate wash down and drying between samples and the use of appropriate sample containers supplied by Hill Laboratories, individually labelled and cross referenced using chain of custody documentation. Soils were stored in a chilled cool box prior to dispatch to the laboratories the next day.

A total of thirty five soil samples were collected from the site and scheduled for laboratory analysis by the SQEP. Samples taken from within the vineyard were composited with 2 samples combined in to one sample. This was undertaken due to the homogeneity of the soils across the vineyard area of the site. Chemical analyses initially undertaken were as follows:

- Organo-chlorine pesticide screen; and
- Heavy metals with mercury.

The results of analytical testing are presented in Appendix D.

6.2 Field Quality Assurance and Quality Control

Sampling of near surface soils was completed on 7th and 10th July 2017. Weather conditions were sunny and dry with frozen ground.

Samples were collected in laboratory supplied clean plastic pots and sent to Hill Laboratories via courier for pesticide screening and heavy metals analysis.

Decontamination of equipment was completed between the sample locations. Soil samples for laboratory analysis were collected using a hand trowel whilst wearing protective disposable gloves. Gloves were then changed between sample sites and the trowel was brushed and washed between each sample location.

Chain of Custody (CoC) forms from Hill Laboratories were requested for receipt of the samples and are presented with the results in Appendix F.

The location of samples taken are detailed in the sample location plan in Appendix E. Samples were not taken from the proposed sections 1, 2 and 3 due to access constraints at the time of the investigation, however due to the homogeneity of soils across the site soil characteristics can be inferred on the basis of results from across the remainder of the vineyard..

6.3 Laboratory QA/QC

The Hill Laboratory Analysis report has been appended for perusal in Appendix F. This includes the analytical methods used by the laboratory and the laboratory accreditation for analytical methods used.

All Laboratory Analysis was completed through Hill Laboratories. Hill Laboratories are accredited by International Accreditation New Zealand (IANZ), which represents New Zealand in the International Laboratory Accreditation Cooperation (ILAC). Through the ILAC Mutual Recognition Arrangement (ILAC-MRA) this accreditation is internationally recognised.

6.4 QA/QC Data Evaluation

Table 2: QA/QC Data Evaluation

EVALUATION OF ALL FIELD AND LABORATORY QA/QC INFORMATION	
Documentation and data completeness	Refer to sections 6.1 and 6.2.
Data representativeness	Refer to section 6 and 6.1.
Precision and accuracy of sampling and analysis for each analyte in each environmental matrix informing data users of the reliability, unreliability or qualitative value of the data.	Refer to sections 6.1 and 6.2
Data comparability checks	
Collection and analysis of samples by different personnel	N/A
Collection and analysis by the same personnel using the same methods but at different times	Samples were collected on 7th and 10th July 2017. Weather conditions and ground conditions did not change during the sampling period.
Use of different sampling or analytical methodologies from those stipulated in the guideline documents	N/A
Spatial and temporal changes	N/A

7 Basis for Guideline Values

For contaminated site assessments the hierarchy of reference documents containing guidelines for soils and waters, the MfE Contaminated Land Management Guidelines No 2 (November 2003) is referred to.

The proposed development comprises a rural residential/lifestyle block land use.

The primary human health receptors have been determined to be construction workers and end-users of the site. As such the most conservative end-use of rural residential (25% produce) is proposed for assessment purposes to take in to consideration potential regular contact with soils on the site by end-users, as highlighted in Table 3.

Table 3: Land Use Scenario

Scenario	Description
Rural / lifestyle block	Rural residential land use, including home-grown produce consumption (10 per cent). Applicable to the residential vicinity of farm houses for protection of farming families, but not the productive parts of agricultural land. (Not for regulatory use.)
Residential	Standard residential lot, for single dwelling sites with gardens, including home-grown produce consumption (10 per cent).
High-density residential	Urban residential with limited soil contact, including small ornamental gardens but no vegetable garden (no home-grown produce consumption); applicable to urban townhouses, flats and ground-floor apartments with small ornamental gardens, but not high-rise apartments.
Parks / recreational	Public and private green areas and reserves that are used for active sports and recreation. This scenario is intended to cover playing fields and suburban reserves where children play frequently. It can also reasonably cover secondary school playing fields but not primary school playing fields. Check exposure for park maintenance staff using commercial / industrial unpaved.
Commercial / industrial outdoor worker (unpaved)	Commercial / industrial site with varying degrees of exposed soil. Exposure of outdoor workers to near-surface soil during routine maintenance and gardening activities with occasional excavation as part of maintaining sub-surface utilities (ie, a caretaker or site maintenance personnel). Also conservatively applicable to outdoor workers on a largely unpaved site.

Results from these screening analyses have initially been compared against soil guideline values (SGVs) from the National Environmental Standards (NES) Appendix B: Soil Contaminant Standards. Where no New Zealand Standards were available or more detailed guideline values were required contaminants concentrations have been assessed using the appropriate guidelines within the MfE Environmental Guideline Value (EGV) Database and are specified in the assessment results (see arsenic SGV reassessment below). SGVs for inorganic contaminants used in this assessment are outlined in Table 4.

Table 4: NES 'Soil Contaminants Standards for health (SCS (health)) for inorganic compounds

	Arsenic	Boron	Cadmium (pH 5)[1]	Chromium		Copper	Inorganic lead	Inorganic mercury
				III	VI			
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Rural residential / lifestyle block 25% produce	17	>10,000	0.8	>10,000	290	>10,000	160	200
Residential 10% produce	20	>10,000	3	>10,000	460	>10,000	210	310
High-density residential	45	>10,000	230	>10,000	1,500	>10,000	500	1,000
Recreation	80	>10,000	400	>10,000	2,700	>10,000	880	1,800
Commercial / industrial outdoor worker (unpaved)	70	>10,000	1,300	>10,000	6,300	>10,000	3,300	4,200

Notes: All concentrations refer to dry weight (ie, mg/kg dry weight)

[1] Default value is for soil that is pH 5. Concentrations increase with increasing pH (see *Methodology*).

Although not a requirement of the NES environmental receptors have also been considered and as such environmental soil contaminants standards within the EGV database have also been considered as part of this assessment.

7.1 Background Concentrations

For the purposes of comparison with background concentrations to determine the applicability of the NES as per NES Regulation 5(9). No background concentrations specific to Central Otago are currently available. However, reference can be made to the LRIS Portal which gives information on Predicted Background Soil Concentrations for New Zealand. These background concentrations are intended to provide an initial assessment of background soil concentrations based on the underlying geological unit for applicability of the NES and to determine cleanfill disposal criteria.

For the purpose of comparison with background concentrations as per NES regulation 5(9), background concentrations of organochlorine pesticides, including DDT and its isomers above the laboratory's limit of detection were determined as being above background concentrations

7.2 Disposal Criteria

In addition to assessing the human health risks and environmental risks associated with the development and end use of the site, an assessment of off-site disposal options for any excess spoil generated during site development works has been conducted. Depending upon the contamination condition of the spoil off-site options range from disposal to 'cleanfill' sites (lowest cost) through managed sites to licensed hazardous waste landfills (highest cost).

A disposal to a 'cleanfill' site represents the most cost effective off-site disposal option, the results have been compared to the MfE definition of "cleanfill". The publication "A guide to the Management of Clean Fills" (MfE 2002) defines clean fill as:

> *"Material that when buried will have no adverse effect on people or the environment. Clean-fill material includes virgin natural materials such as clay, soil and rock, and other inert materials such as concrete or brick that are free of:*
>
> - *Combustible, putrescible, degradable or leachable components;*
> - *Hazardous substances;*
> - *Products or materials derived from hazardous waste treatment, hazardous waste stabilisation or hazardous waste disposal practices;*
> - *Materials that may present a risk to human health or animal health such as medial and veterinary waste. Asbestos or radioactive substances; and*
> - *Liquid waste."*

The requirement for the material to be 'free' of 'hazardous substances' effectively requires the concentrations of non-naturally occurring compounds to be the level of analytical detection. In terms of naturally occurring compounds it is generally recognised that clean-fill acceptance criteria are defined by the background concentrations of these compounds in the relevant local or regional environment.

For the purpose of comparison with background concentrations as per NES regulation 5(9), background concentrations of organochlorine pesticides, including DDT and its isomers above the laboratory's limit of detection were determined as being above background concentrations.

To provide an indication of disposal options, comparison of the results against the Landfill Acceptance Criteria has also been made to assist with determining where any excess material may be disposed

Table 4: Extract of Appendix A of the Hazardous Waste Guidelines – Landfill Waste Acceptance Criteria for Class A and B Landfills (Refer to full document for footnotes)

	CLASS A LANDFILLS		CLASS B LANDFILLS	
	Screening Criteria (mg/kg)	Concentration in Leachate (mg/L)	Screening Criteria (mg/kg)	Concentration in Leachate (mg/L)
Arsenic	100	5	10	0.5
Boron	400	20	40	2
Cadmium	20	1	2	0.1
Chromium (IV)	100	5	10	0.5
Copper	100	5	10	0.5
Lead	100	5	10	0.5
Mercury	4	0.2	0.4	0.02

7.3 Results of Chemical Laboratory Analysis

The results of the chemical laboratory analysis were initially compared against the NES Soil Contaminant Standards for Health (SCS $_{(health)}$). The proposed development was assessed for a rural residential land use scenario with 25% produce consumption. This is considered conservative based on the proposed site of sections on site. Other metals analysed were compared to appropriate soil guideline values which are referenced within the summary table.

The chemical laboratory results are presented in Appendix F and summarised in Table 5 below.

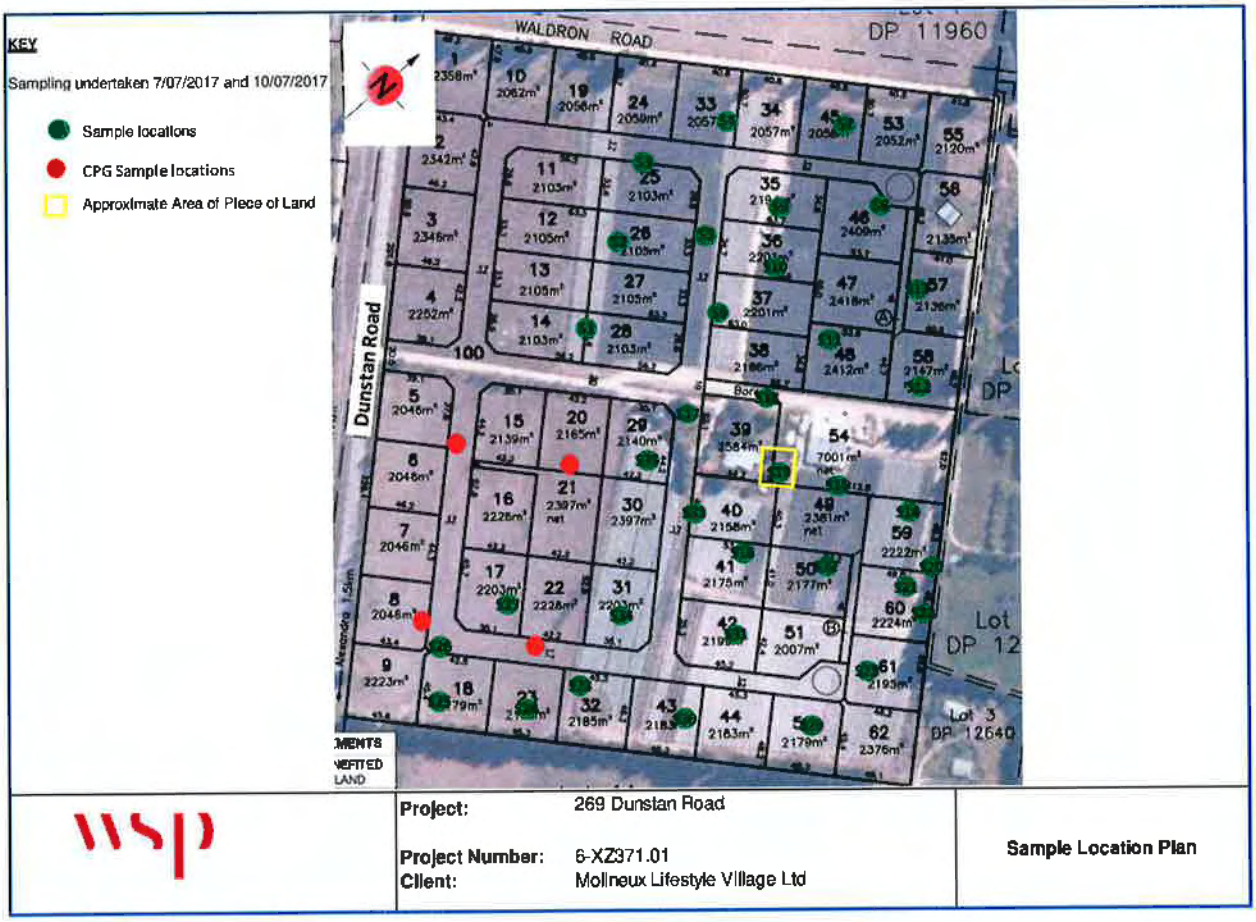
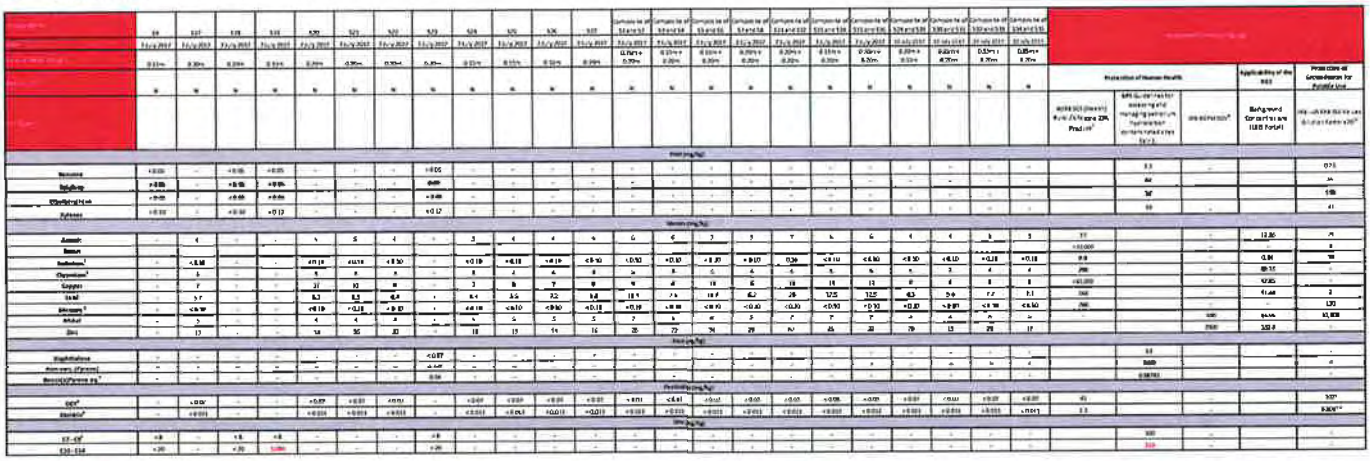


Figure 6: Sample Location Plan

Table 5: Summary of Metals and Pesticide Results



7.4 Human Health Criteria

NES Heavy Metals

Laboratory results indicated that none of the analysed soil samples for heavy metals exceeded their relevant soil guideline value for NES SCS (health) for a rural residential land-use with 25% produce consumption.

PAH's

PAH's were screened in a single soil sample collected from next to the pile of rubbish that had been recently burned during the PSI. The results returned were below their relevant SGV for the type of soil (silty sand) that was identified on site.

Pesticides

A full range of organochlorine pesticides were screened in nineteen soil samples taken from the vineyard area of the site. All results, were returned below their method detection limit and as such were below their relevant SGV for a rural residential end use.

TPH's

TPH's were screened in four soil samples collected from areas which were thought to present a higher risk of contamination during the PSI. The results returned were below their relevant SGV for the type of soil (silty sand) that was identified on site, apart from the C10-C14 fraction which had a concentration of 1080 mg/kg in S19. This elevated concentration is over double the SGV of 510 mg/kg denoted by the Ministry of the Environment for the type of soil (silty sand) that was identified on site.

MAH's (BTEX)

MAH's were screened in four soil samples collected from areas which were thought to present a higher risk of contamination during the PSI. The results returned were below their relevant SGV for the type of soil (silty sand) that was identified on site.

7.5 Background Concentrations

Assessment of heavy metal analysis results indicate that none were present above their local background concentrations.

A point source of petroleum hydrocarbons in the diesel range was noted on site.

7.6 Waste Disposal of Soils

Assessment of results against background indicates that soils removed from site (with the exception of the area around the point source of TPH) may be considered as cleanfill.

Soils from the area of TPH contamination would need to be disposed as managed waste at a facility authorised to accept these materials

For any soil which is to be disposed off-site as managed fill, reference to the MfE Hazardous Waste Guidelines should be made.

7.7 Revised Risk Assessment

Chemical analysis results have revealed no elevated concentrations of heavy metals, PAH's, MAH's and pesticides within the near surface soil sampled. In addition, with the exception of C10 – C14, TPH's were not encountered in elevated concentrations across any of the site investigated.

A single C10 – C14 concentration in excess of the SGV was recorded at a specific location on the site (S19). However it should be noted that this result was not unexpected as soil was collected at 0.20m bgl in an area situated directly below the above ground fuel tank located on the site. As such the TPH exceedance located below the above ground fuel tank does pose a direct exposure risk however this risk is limited to the immediate vicinity of the fuel tank.

8 Conclusions and Recommendations

The conceptual site model and human health risk assessment presented herein is based upon information gained from a site inspection, anecdotal evidence, information gained from CODC and other sources together with an assessment of soil conditions using data from detailed soil sampling and chemical analyses, as per the requirements of CLMG and the NES.

Results of the completed chemical analyses indicate that with the exception of diesel range Petroleum Hydrocarbons C10 – C14 from a point source, TPH, PAH, MAH (BTEX), heavy metals and pesticide concentrations are present at levels below accepted and published soil guideline values for a rural residential end use across the site. It is therefore considered highly unlikely that there is a risk to human health associated with anthropogenic sources of contaminants on the site.

Taking into consideration the location of elevated hydrocarbons and visual assessment, it can be determined that only the immediate vicinity of the above ground fuel tank is contaminated by C10-C14 Hydrocarbons. The remaining site area is therefore considered suitable for rural residential purposes.

As such, it is considered **highly unlikely** that there is a risk to human health should the proposed residential activity be undertaken on the remainder of the site. Although no elevated contaminants of concern were encountered within the waste pit, the area in its current condition is not considered suitable for rural residential development. Removal of waste and burnt materials should be undertaken to an appropriate facility prior to any filling of this area of the site.

The above ground fuel tank and surrounding near surface are considered to be a 'piece of land' with respect to the NES and cannot be deemed suitable for the proposed end-use due to an elevated C10-C14 concentration. If that area of the site is to be developed then some form of remedial measures would need to be undertaken on this area in order to create suitable ground conditions.

8.1 Consenting Requirements

Based on the reported soil results, with the exception of the piece of land surrounding the fuel tank, contaminants of concern do not exceed human health criteria or published local background concentrations.

As such, outside of the delineated piece of land as shown on Figure 6, the NES does not apply to the remaining site area.

8.2 Remedial Options

A number of options are available in order to mitigate the presence of elevated Petroleum Hydrocarbons C10 – C14 in the centre of the site, within the vicinity of S19.

- **Do nothing**: this would mean that the area of the site in the immediate vicinity of the above ground fuel tank would not be suitable for a rural residential development. This option would not be suitable should ground disturbance be proposed in the area, however should no change of land use or ground disturbance be proposed the risks posed from localised hydrocarbon contamination can be managed;
- **Localised site strip**: If the fuel tank were to be removed or ground disturbance occur in the vicinity of the fuel tank, the soil directly below would need to be removed thereby removing the risk of future hydrocarbon contamination on the site. In order to ensure the removal of all contaminated soil verification testing would be required in accordance with the requirements of the NES.

8.3 Recommendations

Based on the results of this Detailed Site Investigation, Opus recommends that:

- With the exception of the area in the direct vicinity of the above ground storage tank (Piece of Land), the site is suitable for a rural residential development as soil contamination does not exceed the relevant stated applicable standards;
- Remedial options given above are considered appropriate should development of the area in the immediate vicinity of the above ground storage tank be undertaken;
- Should development be proposed within the vicinity of the waste pit on site, remedial measures will be required in order to remove residual waste along with burnt materials from the area. Infilling of the pit in its present form is not considered appropriate remediation should residential development of the area be proposed.
- Should any ground conditions be encountered across the site which are not anticipated from the findings of this report a Suitably Qualified and Experienced Practitioner (SQEP) should be consulted in order to reassess the risks to human health;
- This Detailed Site Investigation report is submitted to the consenting authority.
- This Detailed Site Investigation report is submitted to the reginal authority in to facilitate updating the HAIL database; and
- Any disturbance of soils on the subdivided sections proposed for rural residential development are considered to be controlled activities as this Detailed Site Investigation does not exceed the relevant applicable standard.

9 Applicability and Limitations

This report has been prepared for the benefit of the client, Molyneux Lifestyle Village Ltd with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose without our review or agreement.

This report has been prepared for a specific purpose, as agreed between Opus and the client. A tailored scope of works has been used to achieve the objectives and the report should therefore not be used for different objectives.

This report has been prepared by Opus with all reasonable skill and care within the terms of the contract with the client, and taking account of the information made available by the client. The findings and opinions conveyed via this report are based on information obtained from a variety of sources, as detailed, which Opus believes are reliable. Nevertheless, Opus cannot and does not guarantee the authenticity or reliability of any information supplied by other parties.

The characterisation of site conditions is an interpretation of information collected during assessment, in accordance with industry best practice. Due to the inherent variation in spatial and temporal patterns of contamination, the interpretation of site conditions at the specific locations investigated is not a complete description of all material at the site. Whilst this report may express an opinion on the possible configuration of strata or contaminants between or beyond exploratory hole positions or in the possible presence of features based on either visual, verbal or published evidence, this is for guidance only and no liability can be accepted for its accuracy. Should further data be obtained that differs from that presented in this report, then conclusions and recommendations may no longer be valid.

This report is valid at the date of release. The condition of the site may change with time so that the results and interpretation are no longer valid. In addition, guidelines and legislation may change, making assessment of results and recommendations invalid

Appendix A
Historical Information

QuickMap Title Details

Information last updated as at 03 Jul 2017

COMPUTER FREEHOLD REGISTER
DERIVED FROM LAND INFORMATION NEW ZEALAND

Identifier OT5B/1137
Land Registration District Otago
Date Issued 15 June 1973

Prior References
OT4D/343

Type Fee Simple
Area 4.0469 hectares more or less
Legal Description Part Lot 13 Deposited Plan 3194

Proprietors
Molyneux Lifestyle Village Limited

482177 Transfer creating the following easements - 29.6.1977 at 10:03 am

Type	Servient Tenement	Easement Area	Dominant Tenement	Statutory Restriction
Store water	Section 51 Block VII Leaning Rock Survey District - CT OT6A/1156	Storage easement A Transfer 482177	Part Lot 13 Deposited Plan 3194 - herein	
Convey water	Section 51 Block VII Leaning Rock Survey District - CT OT6A/1156	Line Pipeline easement Diagram A Transfer 482177	Part Lot 13 Deposited Plan 3194 - herein	
Convey water	Lot 1 Deposited Plan 12640 - CT OT6A/1154	Line Pipeline easement Diagram B Transfer 482177	Part Lot 13 Deposited Plan 3194 - herein	
Convey water	Lot 2 Deposited Plan 12640 - CT OT6A/1155	Line Pipeline easement Diagram B Transfer 482177	Part Lot 13 Deposited Plan 3194 - herein	

Subject to a right to convey water over part marked A DP 417284 created by Easement Instrument 8206380.1 - 29.6.2009 at 12:13 pm

The information provided on this report forms a guideline only. As a result, Custom Software Limited cannot and does not provide any warranties or assurances of any kind in relation to the accuracy of the information provided through this report, the Site and Service. Custom Software Limited will not be liable for any claims in relation to the content of this report, the site and this service.

QuickMap Title Details

Information last updated as at 03 Jul 2017

COMPUTER FREEHOLD REGISTER
DERIVED FROM LAND INFORMATION NEW ZEALAND

Identifier OT5B/1138
Land Registration District Otago
Date Issued 15 June 1973

Prior References
OT4D/343

Type Fee Simple
Area 4.2543 hectares more or less
Legal Description Part Lot 13 Deposited Plan 3194

Proprietors
Molyneux Lifestyle Village Limited

482177 Transfer creating the following easements - 29.6.1977 at 10.03 am

Type	Servient Tenement	Easement Area	Dominant Tenement	Statutory Restriction
Store water	Section 51 Block VII Leaning Rock Survey District - CT OT6A/1156	Storage easement diagram A Transfer 482177	Part Lot 13 Deposited Plan 3194 - herein	
Convey water	Section 51 Block VII Leaning Rock Survey District - CT OT6A/1156	Line Pipeline easement diagram A Transfer 482177	Part Lot 13 Deposited Plan 3194 - herein	
Convey water	Lot 1 Deposited Plan 12640 - CT OT6A/1154	Line Pipeline easement diagram B Transfer 482177	Part Lot 13 Deposited Plan 3194 - herein	
Convey water	Lot 2 Deposited Plan 12640 - CT OT6A/1155	Line Pipeline easement diagram B Transfer 482177	Part Lot 13 Deposited Plan 3194 - herein	

Subject to a right to convey water over part marked B DP 417284 and right to take and convey water over part marked C DP 417284 created by Easement Instrument 8206380.1 - 29.6.2009 at 12:13 pm

Subject to a right to convey electricity (in gross) over part marked D on DP 506529 in favour of Aurora Energy Limited created by Easement Instrument 10659232.4 - 24.4.2017 at 4:06 pm

The information provided on this report forms a guideline only. As a result, Custom Software Limited cannot and does not provide any warranties or assurances of any kind in relation to the accuracy of the information provided through this report, the Site and Service. Custom Software Limited will not be liable for any claims in relation to the content of this report, the site and this service.

QuickMap Title Details

Information last updated as at 03 Jul 2017

COMPUTER FREEHOLD REGISTER
DERIVED FROM LAND INFORMATION NEW ZEALAND

Identifier OT5B/1138
Land Registration District Otago
Date Issued 15 June 1973

Prior References
OT4D/843

Type Fee Simple
Area 4.2543 hectares more or less
Legal Description Part Lot 13 Deposited Plan 3194

Proprietors
Molyneux Lifestyle Village Limited

482177 Transfer creating the following easements - 29.6.1977 at 10.03 am

Type	Servient Tenement	Easement Area	Dominant Tenement	Statutory Restriction
Store water	Section 51 Block VII Leaning Rock Survey District - CT OT6A/1156	Storage easement diagram A Transfer 482177	Part Lot 13 Deposited Plan 3194 - herein	
Convey water	Section 51 Block VII Leaning Rock Survey District - CT OT6A/1156	Line Pipeline easement diagram A Transfer 482177	Part Lot 13 Deposited Plan 3194 - herein	
Convey water	Lot 1 Deposited Plan 12640 - CT OT6A/1154	Line Pipeline easement diagram B Transfer 482177	Part Lot 13 Deposited Plan 3194 - herein	
Convey water	Lot 2 Deposited Plan 12640 - CT OT6A/1155	Line Pipeline easement diagram B Transfer 482177	Part Lot 13 Deposited Plan 3194 - herein	

Subject to a right to convey water over part marked B DP 417284 and right to take and convey water over part marked C DP 417284 created by Easement Instrument 8206380.1 - 29.6.2009 at 12:13 pm

Subject to a right to convey electricity (in gross) over part marked D on DP 506529 in favour of Aurora Energy Limited created by Easement Instrument 10659232.4 - 24.4.2017 at 4:06 pm

QuickMap Title Details

Information last updated as at 03 Jul 2017

COMPUTER FREEHOLD REGISTER
DERIVED FROM LAND INFORMATION NEW ZEALAND

Identifier	**OT5B/1025**
Land Registration District	**Otago**
Date Issued	**21 June 1973**

Prior References

OT4D/344

Type	**Fee Simple**
Area	**4.0620 hectares more or less**
Legal Description	**Part Lot 12 Deposited Plan 3194**

Proprietors

Molyneux Lifestyle Village Limited

482177 Transfer creating the following easements - 29.6.1977 at 10.03 am

Type	Servient Tenement	Easement Area	Dominant Tenement	Statutory Restriction
Store water	Section 51 Block VII Leaning Rock Survey District - CT OT6A/1156	Storage Easement A Transfer 482177	Part Lot 12 Deposited Plan 3194 - herein	
Convey water	Section 51 Block VII Leaning Rock Survey District - CT OT6A/1156	Pipeline Easement A Transfer 482177	Part Lot 12 Deposited Plan 3194 - herein	
Convey water	Lot 1 Deposited Plan 12640 - CT OT6A/1154	Pipeline Easement B Transfer 482177 B	Part Lot 12 Deposited Plan 3194 - herein	
Convey water	Lot 2 Deposited Plan 12640 - CT OT6A/1155	Pipeline Easement B Transfer 482177 B	Part Lot 12 Deposited Plan 3194 - herein	

QuickMap Title Details
Historic Information

Information last updated as at 03 Jul 2017

COMPUTER FREEHOLD REGISTER
DERIVED FROM LAND
INFORMATION NEW ZEALAND

Identifier OT5B/1137
Land Registration District Otago
Date Issued 15 June 1973

Historic Memorials

482177 Transfer creating the following easements - 29.6.1977 at 10.08 am

Type	Servient Tenement	Easement Area	Dominant Tenement	Statutory Restriction
Store water	Section 51 Block VII Leaning Rock Survey District - CT OT6A/1156	Storage easement A Transfer 482177	Part Lot 13 Deposited Plan 3194 - herein	
Convey water	Section 51 Block VII Leaning Rock Survey District - CT OT6A/1156	Line Pipeline easement Diagram A Transfer 482177	Part Lot 13 Deposited Plan 3194 - herein	
Convey water	Lot 1 Deposited Plan 12640 - CT OT6A/1154	Line Pipeline easement Diagram B Transfer 482177	Part Lot 13 Deposited Plan 3194 - herein	
Convey water	Lot 2 Deposited Plan 12640 - CT OT6A/1155	Line Pipeline easement Diagram B Transfer 482177	Part Lot 13 Deposited Plan 3194 - herein	

894523.5 Mortgage to Bank of New Zealand - 1.11.1995 at 9.33 am

5534867.1 Discharge of Mortgage 894523.5 - 27.3.2003 at 9:00 am

5534867.2 Mortgage to Southland Building Society - 27.3.2003 at 9:00 am

7747719.1 Discharge of Mortgage 5534867.2 - 1.4.2008 at 9:38 am

7747719.2 Transfer to William Hill Holdings Limited - 1.4.2008 at 9:38 am

7747719.3 Mortgage to Southland Building Society - 1.4.2008 at 9:38 am

Subject to a right to convey water over part marked A DP 417284 created by Easement Instrument 8206380.1 - 29.6.2009 at 12:13 pm

10353666.1 CAVEAT BY DIVINE INTERNATIONAL LIMITED - 4.3.2016 at 3:15 pm

10666627.2 Withdrawal of Caveat 10353666.1 - 21.12.2016 at 1:18 pm

10780875.1 Transfer in exercise of power of sale in Mortgage 7747719.3 to Molyneux Lifestyle Village Limited - 31.5.2017 at 2:42 pm

Historic Owners

WILLIAM HILL HOLDINGS LIMITED

WILLIAM HILL LIMITED

QuickMap Title Details
Historic Information

Information last updated as at 03 Jul 2017

COMPUTER FREEHOLD REGISTER
DERIVED FROM LAND
INFORMATION NEW ZEALAND

Identifier OT5B/1138
Land Registration District Otago
Date Issued 15 June 1973

Historic Memorials

482177 Transfer creating the following easements - 29.6.1977 at 10.03 am

Type	Servient Tenement	Easement Area	Dominant Tenement	Statutory Restriction
Store water	Section 51 Block VII Leaning Rock Survey District - CT OT6A/1156	Storage easement diagram A Transfer 482177	Part Lot 13 Deposited Plan 3194 - herein	
Convey water	Section 51 Block VII Leaning Rock Survey District - CT OT6A/1156	Line Pipeline easement diagram A Transfer 482177	Part Lot 13 Deposited Plan 3194 - herein	
Convey water	Lot 1 Deposited Plan 12640 - CT OT6A/1154	Line Pipeline easement diagram B Transfer 482177	Part Lot 13 Deposited Plan 3194 - herein	
Convey water	Lot 2 Deposited Plan 12640 - CT OT6A/1155	Line Pipeline easement diagram B Transfer 482177	Part Lot 13 Deposited Plan 3194 - herein	

894523.5 Mortgage to Bank of New Zealand - 1.11.1995 at 9:33 am

5534867.1 Discharge of Mortgage 894523.5 - 27.3.2003 at 9:00 am

5534867.2 Mortgage to Southland Building Society - 27.3.2003 at 9:00 am

7747719.1 Discharge of Mortgage 5534867.2 - 1.4.2008 at 9:38 am

7747719.2 Transfer to William Hill Holdings Limited - 1.4.2008 at 9:38 am

7747719.3 Mortgage to Southland Building Society - 1.4.2008 at 9:38 am

Subject to a right to convey water over part marked B DP 417284 and right to take and convey water over part marked C DP 417284 created by Easement Instrument 8206380.1 - 29.6.2009 at 12:13 pm

9540867.1 CAVEAT BY AURORA ENERGY LIMITED - 11.10.2013 at 8:38 am

10659232.1 Withdrawal of Caveat 9540867.1 - 24.4.2017 at 4:06 pm

10353666.1 CAVEAT BY DIVINE INTERNATIONAL LIMITED - 4.3.2016 at 3:15 pm

10666627.2 Withdrawal of Caveat 10353666.1 - 21.12.2016 at 1:18 pm

Subject to a right to convey electricity (in gross) over part marked D on DP 506529 in favour of Aurora Energy Limited created by Easement Instrument 10659232.4 - 24.4.2017 at 4:06 pm

10780875.1 Transfer in exercise of power of sale in Mortgage 7747719.3 to Molyneux Lifestyle Village Limited - 31.5.2017 at 2:42 pm

Historic Owners

WILLIAM HILL HOLDINGS LIMITED **WILLIAM HILL LIMITED**

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QuickMap Title Details
Historic Information

Information last updated as at 03 Jul 2017

COMPUTER FREEHOLD REGISTER
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INFORMATION NEW ZEALAND

Identifier OT5B/1024
Land Registration District Otago
Date Issued 21 June 1973

Historic Memorials

482177 Transfer creating the following easements - 29.6.1977 at 10.03 am

Type	Servient Tenement	Easement Area	Dominant Tenement	Statutory Restriction
Store water	Section 51 Block VII Leaning Rock Survey District - CT OT6A/1156	Storage Easement diagram A Transfer 482177	Part Lot 12 Deposited Plan 3194 - herein	
Convey water	Section 51 Block VII Leaning Rock Survey District - CT OT6A/156	Line pipeline easement diagram A Transfer 482177	Part Lot 12 Deposited Plan 3194 - herein	
Convey water	Lot 1 Deposited Plan 12640 - CT OT6A/1154	Line pipeline easement diagram B Transfer 482177	Part Lot 12 Deposited Plan 3194 - herein	
Convey water	Lot 2 Deposited Plan 12640 - CT OT6A/1155	Line pipeline easement diagram B Transfer 482177	Part Lot 12 Deposited Plan 3194 - herein	

5534863.1 Transfer to David James Grant - 27.3.2003 at 9:00 am

5534863.2 Mortgage to Southland Building Society - 27.3.2003 at 9:00 am

6623242.1 NOTICE OF CLAIM OF INTEREST PURSUANT TO SECTION 42(2) PROPERTY (RELATIONSHIPS) ACT 1976 BY JOANNA MARGARET ROBINSON - 26.10.2005 at 9:00 am

8335428.1 Withdrawal of Notice of Claim 6623242.1 - 17.11.2009 at 9:11 am

10353639.1 CAVEAT BY DIVINE INTERNATIONAL LIMITED (AFFECTS PART) - 4.3.2016 at 3:14 pm

10666627.1 Withdrawal of Caveat 10353639.1 - 21.12.2016 at 1:18 pm

10353740.1 CAVEAT BY DIVINE INTERNATIONAL LIMITED - 4.3.2016 at 3:16 pm

10666627.3 Withdrawal of Caveat 10353740.1 - 21.12.2016 at 1:18 pm

10780875.2 Transfer in exercise of power of sale in Mortgage 5534863.2 to Molyneux Lifestyle Village Limited - 31.5.2017 at 2:42 pm

Historic Owners

DAVID JAMES GRANT

SELWYN ERNEST TOMKINS

QuickMap Title Details
Historic Information

Information last updated as at 03 Jul 2017

COMPUTER FREEHOLD REGISTER
DERIVED FROM LAND
INFORMATION NEW ZEALAND

Identifier **OT5B/1025**
Land Registration District **Otago**
Date Issued 21 June 1973

Historic Memorials

482177 Transfer creating the following easements - 29.6.1977 at 10.03 am

Type	Servient Tenement	Easement Area	Dominant Tenement	Statutory Restriction
Store water	Section 51 Block VII Leaning Rock Survey District - CT OT6A/1156	Storage Easement A Transfer 482177	Part Lot 12 Deposited Plan 3194 - herein	
Convey water	Section 51 Block VII Leaning Rock Survey District - CT OT6A/1156	Pipeline Easement A Transfer 482177	Part Lot 12 Deposited Plan 3194 - herein	
Convey water	Lot 1 Deposited Plan 12640 - CT OT6A/1154	Pipeline Easement B Transfer 482177 B	Part Lot 12 Deposited Plan 3194 - herein	
Convey water	Lot 2 Deposited Plan 12640 - CT OT6A/1155	Pipeline Easement B Transfer 482177 B	Part Lot 12 Deposited Plan 3194 - herein	

894523.5 Mortgage to Bank of New Zealand - 1.11.1995 at 9.33 am

5534867.1 Discharge of Mortgage 894523.5 - 27.3.2003 at 9:00 am

5534867.2 Mortgage to Southland Building Society - 27.3.2003 at 9:00 am

7747719.1 Discharge of Mortgage 5534867.2 - 1.4.2008 at 9:38 am

7747719.2 Transfer to William Hill Holdings Limited - 1.4.2008 at 9:38 am

7747719.3 Mortgage to Southland Building Society - 1.4.2008 at 9:38 am

10353666.1 CAVEAT BY DIVINE INTERNATIONAL LIMITED - 4.3.2016 at 3:15 pm

10666627.2 Withdrawal of Caveat 10353666.1 - 21.12.2016 at 1:18 pm

10780875.1 Transfer in exercise of power of sale in Mortgage 7747719.3 to Molyneux Lifestyle Village Limited - 31.5.2017 at 2:42 pm

Historic Owners

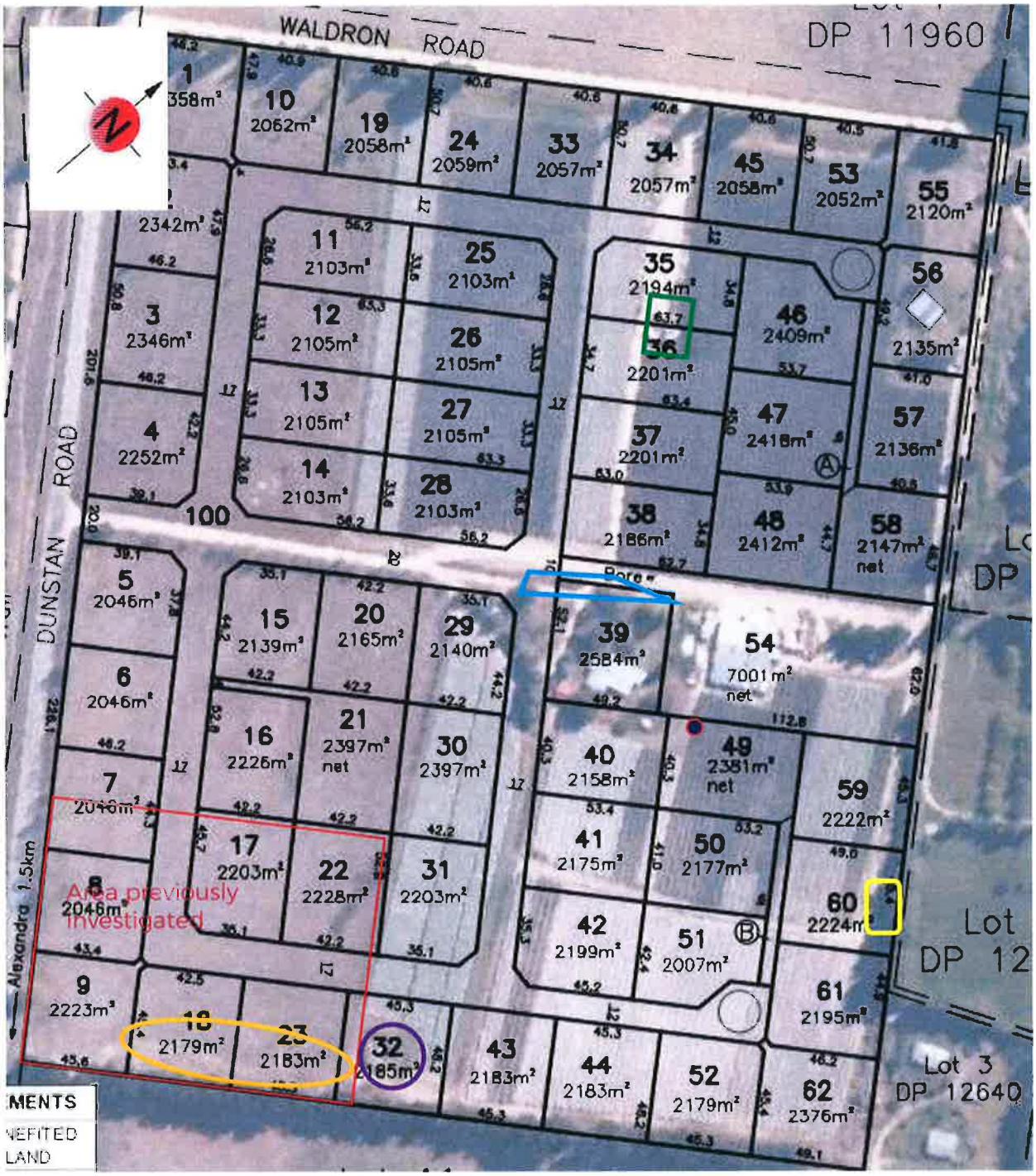
WILLIAM HILL HOLDINGS LIMITED

WILLIAM HILL LIMITED

1966 Aerial Photo

2012 Aerial Photo

Appendix B
Site Layout Plan



Key

- Above ground fuel tank
- Area of recently burned
- Area of fly tipping
- Stone cutting equipment and cut
- Pesticide mixing and storage
- Vehicle parking area.

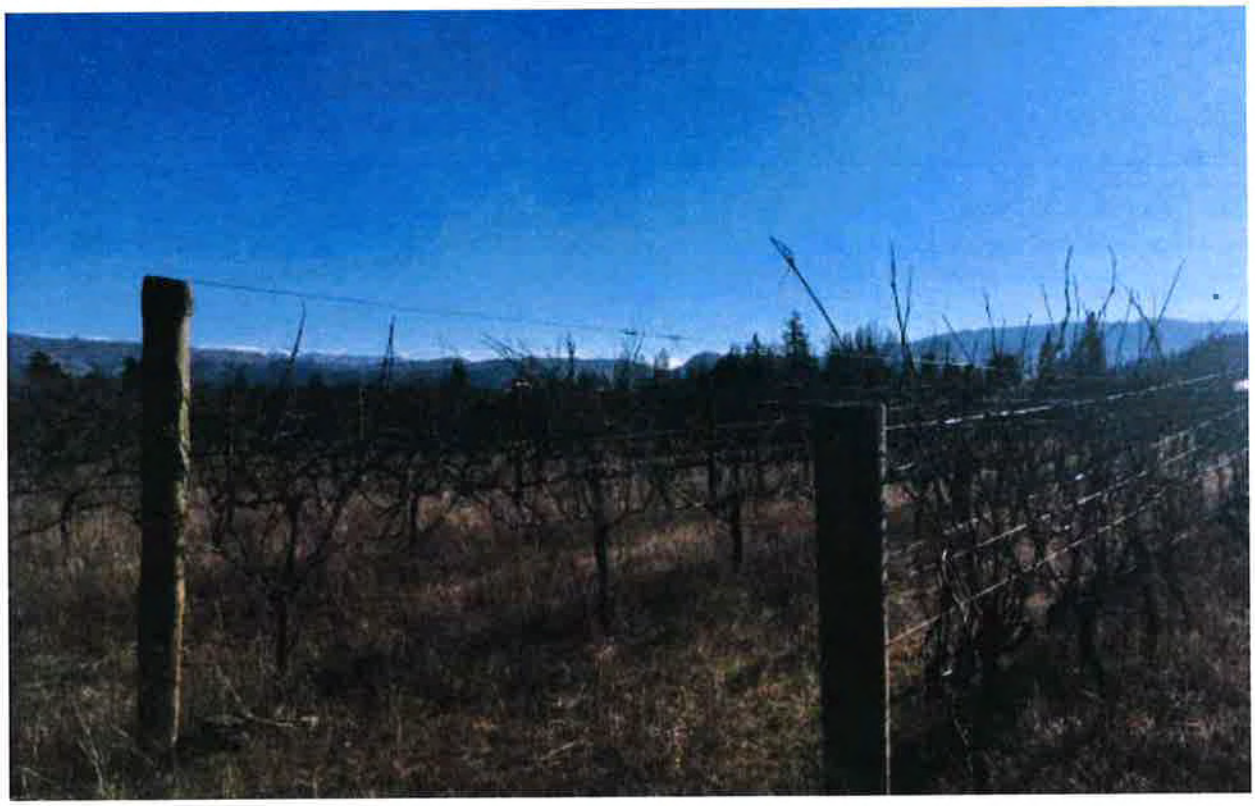
Appendix C
Site Photographs

View south west along the main access road towards the access gate from the centre of the site.

View south east along eastern boundary of site.

Southern site boundary view towards south west.

Fly tipping on southern side of site.



View north west from northern edge of site.

View east from the centre of the site.

Above ground fuel storage tank.

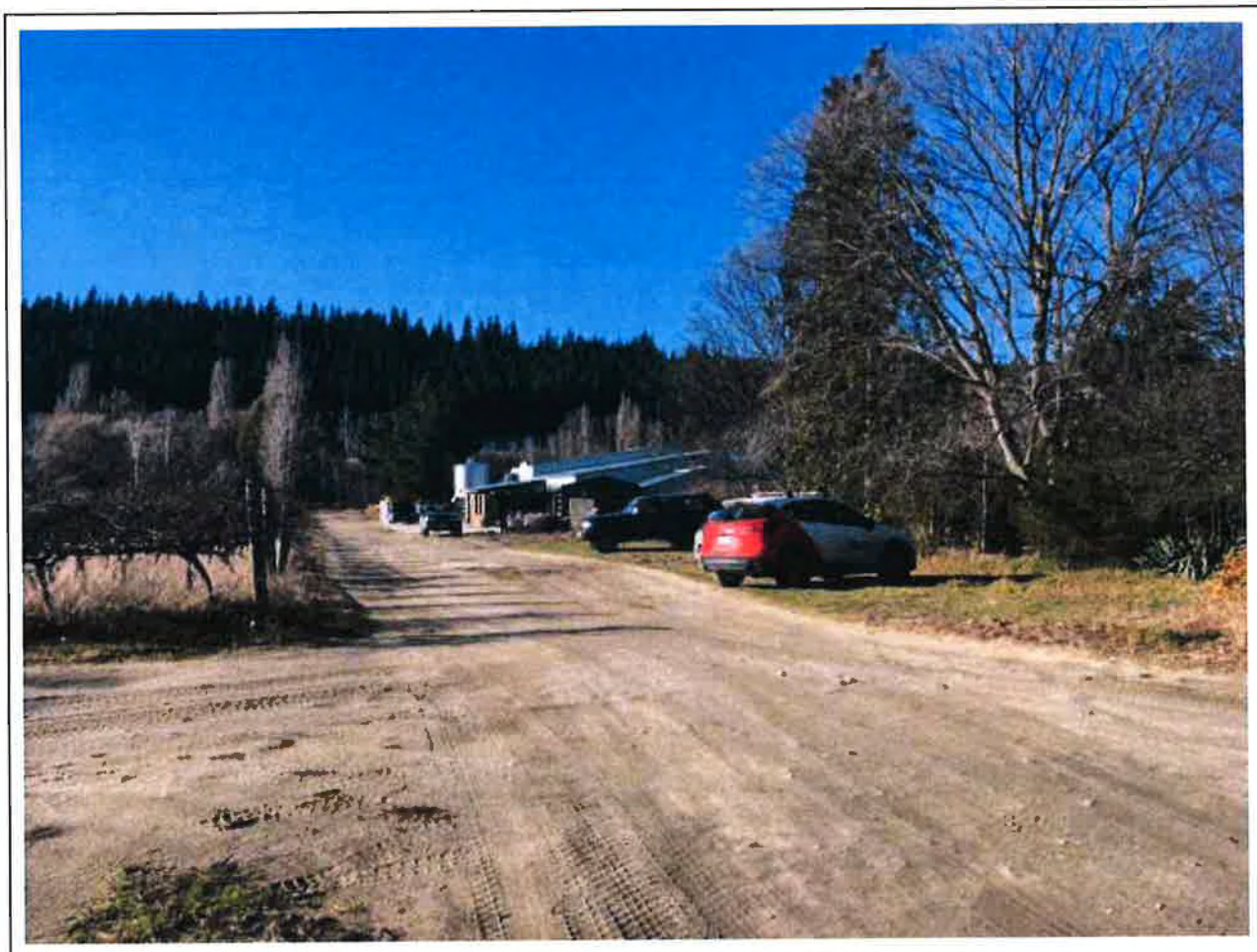
Pesticide storage and mixing shed located on eastern boundary.

Plastic storage drums located on the eastern site boundary just south of the pesticide mixing shed.

Pit containing miscellaneous rubbish close to the southern site boundary taken on the 9th July 2017.

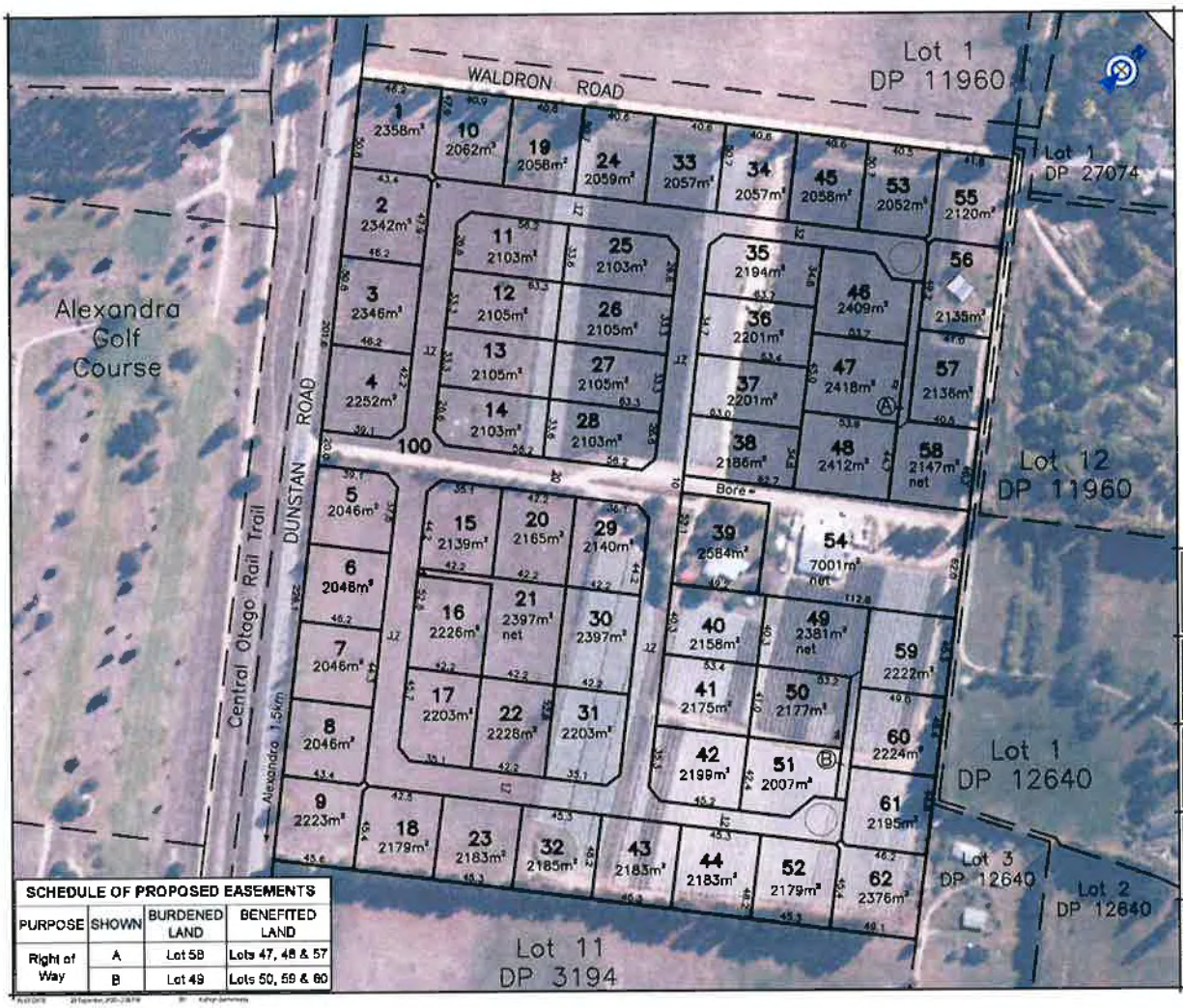
Pit containing recently burnt still slightly smoking rubbish close to the southern site boundary.

Mobile diesel tank for filling house heating system, next to the existing house.



Vehicles parking on the grass next to the winery.

Appendix D
Proposed Development Plan



Notes

- All lots subject to possible easements for power, telecom, water supply & wastewater.
- Areas & dimensions subject to resource consent and legal survey.
- Lot 100 to vest as legal public road in CODC.

SCHEDULE OF PROPOSED EASEMENTS

PURPOSE	SHOWN	BURDENED LAND	BENEFITED LAND
Right of Way	A	Lot 58	Lots 47, 48 & 57
	B	Lot 49	Lots 50, 59 & 60

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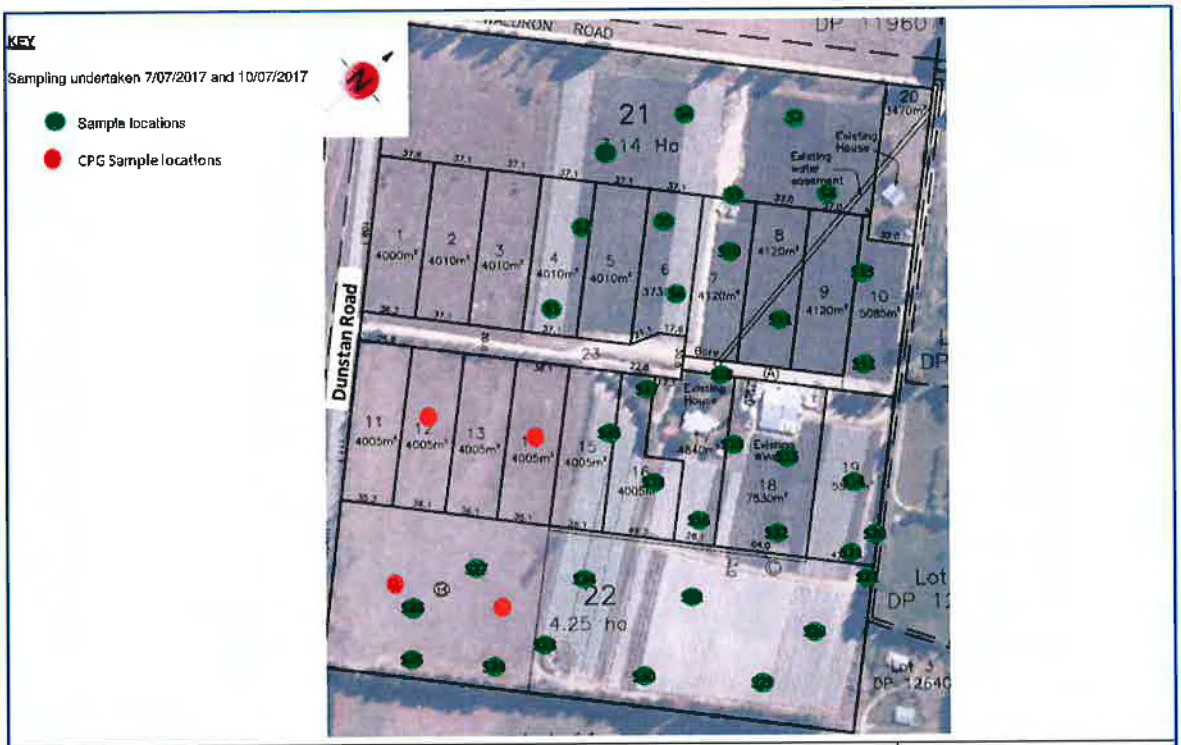
Cromwell 9342.
T 03 445 1826
E cromwell@ppgroup.co.nz

Dunstan Road Subdivision

Lots 1 - 62 & 100 Being a Subdivision of Pt's Lot's 12 & 13 DP 3194

Surveyed		Original Size	Scale
Designed	PD	A3	1:2000
Drawn	KRG		
Checked	PD		DO NOT SCALE
Approved	PD		
Job Ref	Sheet No	Revision No	Date Plotted
A4814_SCM	2	B	21/09/2020

Appendix E
Soil Sampling Location Plan



wsp	**Project:** 269 Dunstan Road **Project Number:** 6-XZ371.01 **Client:** Molineux Lifestyle Village Ltd	**Sample Location Plan**

Appendix F

Hill Laboratories CoC and Results

Hill Laboratories
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ANALYSIS REQUEST

R J Hill Laboratories Limited
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Hamilton 3240 New Zealand

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W www.hill-laboratories.com

Job No: **180 6809** Date Recv: 11-Jul-17 08:42
Received by: Melody Walker

Quote No 82748
Primary Contact EDH
Submitted By EDH
Client Name Opus International
Address 69 Tarbert Street
Alexandra Postcode 9310
Phone 03 440 6218 Mobile
Email elizabeth.hannon@opus.
Charge To OPUS International Consultants Limited 224
Client Reference Dunstan Rd.
Order No

Results To Reports will be emailed to Primary Contact by default. Additional Reports will be sent as specified below.
☒ Email Primary Contact ☐ Email Submitter ☐ Email Client
☐ Email Other
☐ Other

ADDITIONAL INFORMATION

CHAIN OF CUSTODY RECORD

Sent to Hill Laboratories Date & Time:
☐ Tick if you require COC to be emailed back Name: Signature:

Received at Hill Laboratories Date & Time: Name: Signature:

Condition ☐ Room Temp ☐ Chilled ☐ Frozen Temp: 5.4

☐ Sample & Analysis details checked
Signature:

Priority ☐ Low ☐ Normal ☑ High
☐ **Urgent** (ASAP, extra charge applies, please contact lab first)
NOTE: The estimated turnaround time for the types and number of samples and analyses specified on this quote is by 4:30 pm, 5 working days following the day of receipt of the samples at the laboratory.

Requested Reporting Date:

Quoted Sample Types
Soil (Soil), Ground Water (GW), TCLP Extract (TCLP), Building Material (BM)

No.	Sample Name	Sample Date/Time	Sample Type	Tests Required
1	S 1 @ 0.	7/7/17	S	Composite
2	S 2 @ 0.		S	Heavy metals with mercury (HMHgSoil) organochlorine Pesticides Screening (OCPsc)
3	S 3 @ 0.		S	Composite
4	S 4 @ 0		S	HMHgs Soil OCPsc
5	S 5 @ 0.		S	Composite
6	S 6 @ 0.		S	HMHgs Soil OCPsc
7	S 7 @ 0.		S	Composite
8	S 8 @ 0.		S	HMHgs Soil OCPsc
9	S 9 @ 0.		S	~~TPH~~ TPH + BTEX Profile (TPH01BXp)
10	S 10 @ 0.		S	

No.	Sample Name	Sample Date & Time	Sample Type	Tests Required
11	S 11 @ 0.	7/7/17	S	Composite
12	S 12 @ 0.		S	HMHgs Soil OCPsc
13	S 13 @ 0.		S	Composite
14	S 14 @ 0.		S	HMHgs Soil OCPsc
15	S 15 @ 0.		S	~~HMHgs~~ Composite
16	S 16 @ 0.		S	HMHgs Soil OcPsc
17	S 17 @ 0.		S	HMHgs Soil OcPsc
18	S 18 @ 0.		S	TPH + BTEX Profile
19	S 19 @ 0.		S	TPH + BTEX Profile
20	S 20 @ 0.		S	HMHgs Soil OCPsc
21	S 21 @ 0.		S	HMHgs Soil OCPsc
22	S 22 @ 0.		S	HMHgs Soil OCPsc
23	S 23 @ 0.		S	~~PAH~~ TPH + PAH + BTEX Profile
24	S 24 @ 0.		S	HMHgs Soil OCPsc
25	S 25 @ 0.		S	HMHgs Soil OCPsc
26	S 26 @ 0.		S	HMHgs Soil OCPsc
27	S 27 @ 0.	↓	S	HMHgs Soil OCPsc
28	S 28 @ 0.	10/7/17	S	Composite
29	S 29 @ 0.		S	HMHgs Soil OcPsc
30	S 30 @ 0		S	Composite
31	S 31 @ 0.		S	HMHgs Soil OCPsc
32	S 32 @ 0		S	Composite
33	S 33 @ 0.		S	HMHgs Soil OCPsc
34	S 34 @ 0.		S	Composite
35	S 35 @ 0.	↓	S	HMHgs Soil OCPsc
36				
37				
38				
39				
40				

KB Item 23775 Version 2

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Job Information Summary

Client:	Opus International Consultants Limited	**Lab No:**	1806809
Contact:	Elizabeth Hannon	**Date Registered:**	12-Jul-2017 9:29 am
	C/- Opus International Consultants Limited	**Priority:**	High
	PO Box 273	**Quote No:**	82748
	Alexandra 9340	**Order No:**	
		Client Reference:	Dunstan Rd
		Add. Client Ref:	
		Submitted By:	Elizabeth Hannon
		Charge To:	OPUS International Consultants Limited
		Target Date:	18-Jul-2017 4:30 pm

Samples

No	Sample Name	Sample Type	Containers	Tests Requested
1	S1@0.2 07-Jul-2017	Soil	GSoil300	Composite Environmental Solid Samples
2	S2@0.2 07-Jul-2017	Soil	GSoil300	Composite Environmental Solid Samples
3	S3@0.15 07-Jul-2017	Soil	GSoil300	Composite Environmental Solid Samples
4	S4@0.2 07-Jul-2017	Soil	GSoil300	Composite Environmental Solid Samples
5	S5@0.15 07-Jul-2017	Soil	GSoil300	Composite Environmental Solid Samples
6	S6@0.2 07-Jul-2017	Soil	GSoil300	Composite Environmental Solid Samples
7	S7@0.2 07-Jul-2017	Soil	GSoil300	Composite Environmental Solid Samples
8	S8@0.2 07-Jul-2017	Soil	GSoil300	Composite Environmental Solid Samples
9	S9@0.15 07-Jul-2017	Soil	GSoil300	TPH + BTEX profile, Soil
10	S10@0.15 07-Jul-2017	Soil	GSoil300	Hold Cold
11	S11@0.2 07-Jul-2017	Soil	GSoil300	Composite Environmental Solid Samples
12	S12@0.2 07-Jul-2017	Soil	GSoil300	Composite Environmental Solid Samples
13	S13@0.15 07-Jul-2017	Soil	GSoil300	Composite Environmental Solid Samples
14	S14@0.2 07-Jul-2017	Soil	GSoil300	Composite Environmental Solid Samples
15	S15@0.2 07-Jul-2017	Soil	GSoil300	Composite Environmental Solid Samples
16	S16@0.2 07-Jul-2017	Soil	GSoil300	Composite Environmental Solid Samples
17	S17@0.2 07-Jul-2017	Soil	GSoil300	Heavy Metals with Mercury, Screen Level; Organochlorine Pesticides Screening in Soil
18	S18@0.2 07-Jul-2017	Soil	GSoil300	TPH + BTEX profile, Soil
19	S19@0.15 07-Jul-2017	Soil	GSoil300	TPH + BTEX profile, Soil
20	S20@0.2 07-Jul-2017	Soil	GSoil300	Heavy Metals with Mercury, Screen Level; Organochlorine Pesticides Screening in Soil
21	S21@0.2 07-Jul-2017	Soil	GSoil300	Heavy Metals with Mercury, Screen Level; Organochlorine Pesticides Screening in Soil
22	S22@0.2 07-Jul-2017	Soil	GSoil300	Heavy Metals with Mercury, Screen Level; Organochlorine Pesticides Screening in Soil
23	S23@0.2 07-Jul-2017	Soil	GSoil300	TPH + PAH + BTEX profile
24	S24@0.15 07-Jul-2017	Soil	GSoil300	Heavy Metals with Mercury, Screen Level; Organochlorine Pesticides Screening in Soil
25	S25@0.15 07-Jul-2017	Soil	GSoil300	Heavy Metals with Mercury, Screen Level; Organochlorine Pesticides Screening in Soil
26	S26@0.15 07-Jul-2017	Soil	GSoil300	Heavy Metals with Mercury, Screen Level; Organochlorine Pesticides Screening in Soil
27	S27@0.2 07-Jul-2017	Soil	GSoil300	Heavy Metals with Mercury, Screen Level; Organochlorine Pesticides Screening in Soil
28	S28@0.2 10-Jul-2017	Soil	GSoil300	Composite Environmental Solid Samples
29	S29@0.15 10-Jul-2017	Soil	GSoil300	Composite Environmental Solid Samples
30	S30@0.25 10-Jul-2017	Soil	GSoil300	Composite Environmental Solid Samples
31	S31@0.2 10-Jul-2017	Soil	GSoil300	Composite Environmental Solid Samples
32	S32@0.15 10-Jul-2017	Soil	GSoil300	Composite Environmental Solid Samples
33	S33@0.2 10-Jul-2017	Soil	GSoil300	Composite Environmental Solid Samples

Samples

No	Sample Name	Sample Type	Containers	Tests Requested
34	S34@0.15 10-Jul-2017	Soil	GSoil300	Composite Environmental Solid Samples
35	S35@0.2 10-Jul-2017	Soil	GSoil300	Composite Environmental Solid Samples
36	Composite of S1@0.2 & S2@0.2	Soil	GSoil300	Heavy Metals with Mercury, Screen Level; Organochlorine Pesticides Screening in Soil
37	Composite of S3@0.15 & S4@0.2	Soil	GSoil300	Heavy Metals with Mercury, Screen Level; Organochlorine Pesticides Screening in Soil
38	Composite of S5@0.15 & S6@0.2	Soil	GSoil300	Heavy Metals with Mercury, Screen Level; Organochlorine Pesticides Screening in Soil
39	Composite of S7@0.2 & S8@0.2	Soil	GSoil300	Heavy Metals with Mercury, Screen Level; Organochlorine Pesticides Screening in Soil
40	Composite of S11@0.2 & S12@0.2	Soil	GSoil300	Heavy Metals with Mercury, Screen Level; Organochlorine Pesticides Screening in Soil
41	Composite of S13@0.15 & S14@0.2	Soil	GSoil300	Heavy Metals with Mercury, Screen Level; Organochlorine Pesticides Screening in Soil
42	Composite of S15@0.2 & S16@0.2	Soil	GSoil300	Heavy Metals with Mercury, Screen Level; Organochlorine Pesticides Screening in Soil
43	Composite of S28@0.2 & S29@0.15	Soil	GSoil300	Heavy Metals with Mercury, Screen Level; Organochlorine Pesticides Screening in Soil
44	Composite of S30@0.25 & S31@0.2	Soil	GSoil300	Heavy Metals with Mercury, Screen Level; Organochlorine Pesticides Screening in Soil
45	Composite of S32@0.15 & S33@0.2	Soil	GSoil300	Heavy Metals with Mercury, Screen Level; Organochlorine Pesticides Screening in Soil
46	Composite of S34@0.15 & S35@0.2	Soil	GSoil300	Heavy Metals with Mercury, Screen Level; Organochlorine Pesticides Screening in Soil

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
Heavy Metals with Mercury, Screen Level	Dried sample, < 2mm fraction. Nitric/Hydrochloric acid digestion US EPA 200.2. Complies with NES Regulations. ICP-MS screen level, interference removal by Kinetic Energy Discrimination if required.	0.10 - 4 mg/kg dry wt	17, 20-22, 24-27, 36-46
BTEX in Soil by Headspace GC-MS	Solvent extraction, Headspace GC-MS analysis US EPA 8260B. Tested on as received sample [KBIs:5782,26887,3629]	0.05 - 0.10 mg/kg dry wt	9, 18-19, 23
Organochlorine Pesticides Screening in Soil	Sonication extraction, SPE cleanup, dual column GC-ECD analysis (modified US EPA 8082). Tested on as recieved sample	0.010 - 0.06 mg/kg dry wt	17, 20-22, 24-27, 36-46
Polycyclic Aromatic Hydrocarbons Screening in Soil	Sonication extraction, Dilution or SPE cleanup (if required), GC-MS SIM analysis (modified US EPA 8270). Tested on as received sample. [KBIs:5786,2805,2695]	0.010 - 0.05 mg/kg dry wt	23
Total Petroleum Hydrocarbons in Soil	Sonication extraction in DCM, Silica cleanup, GC-FID analysis US EPA 8015B/MfE Petroleum Industry Guidelines. Tested on as received sample [KBIs:5786,2805,10734]	8 - 60 mg/kg dry wt	9, 18-19, 23
TPH + PAH + BTEX profile	Sonication extraction, SPE cleanup, GC & GC-MS analysis	0.010 - 60 mg/kg dry wt	23
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry), gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed). US EPA 3550	0.10 g/100g as rcvd	9, 17-27, 36-46
Composite Environmental Solid Samples	Individual sample fractions mixed together to form a composite fraction.	-	1-8, 11-16, 28-35
1-Methylnaphthalene	Sonication extraction, SPE cleanup, GC-MS SIM analysis. Modified US EPA 8270.	0.010 mg/kg dry wt	23
2-Methylnaphthalene	Sonication extraction, SPE cleanup, GC-MS SIM analysis. Modified US EPA 8270.	0.010 mg/kg dry wt	23
Perylene	Sonication extraction, SPE cleanup, GC-MS SIM analysis. Modified US EPA 8270.	0.010 mg/kg dry wt	23

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ANALYSIS REPORT

Client:	Opus International Consultants Limited	**Lab No:**	1806809 SPv1
Contact:	Elizabeth Hannon	**Date Received:**	11-Jul-2017
	C/- Opus International Consultants Limited	**Date Reported:**	19-Jul-2017
	PO Box 273	**Quote No:**	82748
	Alexandra 9340	**Order No:**	
		Client Reference:	Dunstan Rd
		Submitted By:	Elizabeth Hannon

Sample Type: Soil

Sample Name:		S9@0.15 07-Jul-2017	S17@0.2 07-Jul-2017	S18@0.2 07-Jul-2017	S19@0.15 07-Jul-2017	S20@0.2 07-Jul-2017
Lab Number:		1806809.9	1806809.17	1806809.18	1806809.19	1806809.20
Individual Tests						
Dry Matter	g/100g as rcvd	91	92	86	97	92
Heavy Metals with Mercury, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	-	4	-	-	5
Total Recoverable Cadmium	mg/kg dry wt	-	< 0.10	-	-	< 0.10
Total Recoverable Chromium	mg/kg dry wt	-	4	-	-	3
Total Recoverable Copper	mg/kg dry wt	-	7	-	-	11
Total Recoverable Lead	mg/kg dry wt	-	6.7	-	-	8.3
Total Recoverable Mercury	mg/kg dry wt	-	< 0.10	-	-	< 0.10
Total Recoverable Nickel	mg/kg dry wt	-	5	-	-	4
Total Recoverable Zinc	mg/kg dry wt	-	17	-	-	18
BTEX in Soil by Headspace GC-MS						
Benzene	mg/kg dry wt	< 0.05	-	< 0.05	< 0.05	-
Toluene	mg/kg dry wt	< 0.05	-	< 0.05	< 0.05	-
Ethylbenzene	mg/kg dry wt	< 0.05	-	< 0.05	< 0.05	-
m&p-Xylene	mg/kg dry wt	< 0.10	-	< 0.10	< 0.10	-
o-Xylene	mg/kg dry wt	< 0.05	-	< 0.05	< 0.05	-
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	-	< 0.011	-	-	< 0.011
alpha-BHC	mg/kg dry wt	-	< 0.011	-	-	< 0.011
beta-BHC	mg/kg dry wt	-	< 0.011	-	-	< 0.011
delta-BHC	mg/kg dry wt	-	< 0.011	-	-	< 0.011
gamma-BHC (Lindane)	mg/kg dry wt	-	< 0.011	-	-	< 0.011
cis-Chlordane	mg/kg dry wt	-	< 0.011	-	-	< 0.011
trans-Chlordane	mg/kg dry wt	-	< 0.011	-	-	< 0.011
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	-	< 0.04	-	-	< 0.04
2,4'-DDD	mg/kg dry wt	-	< 0.011	-	-	< 0.011
4,4'-DDD	mg/kg dry wt	-	< 0.011	-	-	< 0.011
2,4'-DDE	mg/kg dry wt	-	< 0.011	-	-	< 0.011
4,4'-DDE	mg/kg dry wt	-	< 0.011	-	-	< 0.011
2,4'-DDT	mg/kg dry wt	-	< 0.011	-	-	< 0.011
4,4'-DDT	mg/kg dry wt	-	< 0.011	-	-	< 0.011
Total DDT Isomers	mg/kg dry wt	-	< 0.07	-	-	< 0.07
Dieldrin	mg/kg dry wt	-	< 0.011	-	-	< 0.011
Endosulfan I	mg/kg dry wt	-	< 0.011	-	-	< 0.011
Endosulfan II	mg/kg dry wt	-	< 0.011	-	-	< 0.011
Endosulfan sulphate	mg/kg dry wt	-	< 0.011	-	-	< 0.011
Endrin	mg/kg dry wt	-	< 0.011	-	-	< 0.011

IANZ ACCREDITED LABORATORY

This Laboratory is accredited by International Accreditation New Zealand (IANZ), which represents New Zealand in the International Laboratory Accreditation Cooperation (ILAC). Through the ILAC Mutual Recognition Arrangement (ILAC-MRA) this accreditation is internationally recognised.
The tests reported herein have been performed in accordance with the terms of accreditation, with the exception of tests marked *, which are not accredited.

Sample Type: Soil						
Sample Name:		S9@0.15 07-Jul-2017	S17@0.2 07-Jul-2017	S18@0.2 07-Jul-2017	S19@0.15 07-Jul-2017	S20@0.2 07-Jul-2017
Lab Number:		1806809.9	1806809.17	1806809.18	1806809.19	1806809.20
Organochlorine Pesticides Screening in Soil						
Endrin aldehyde	mg/kg dry wt	-	< 0.011	-	-	< 0.011
Endrin ketone	mg/kg dry wt	-	< 0.011	-	-	< 0.011
Heptachlor	mg/kg dry wt	-	< 0.011	-	-	< 0.011
Heptachlor epoxide	mg/kg dry wt	-	< 0.011	-	-	< 0.011
Hexachlorobenzene	mg/kg dry wt	-	< 0.011	-	-	< 0.011
Methoxychlor	mg/kg dry wt	-	< 0.011	-	-	< 0.011
Total Petroleum Hydrocarbons in Soil						
C7 - C9	mg/kg dry wt	< 8	-	< 8	< 8	-
C10 - C14	mg/kg dry wt	< 20	-	< 20	1,080	-
C15 - C36	mg/kg dry wt	< 40	-	< 40	15,700	-
Total hydrocarbons (C7 - C36)	mg/kg dry wt	< 70	-	< 70	16,800	-

Sample Name:		S21@0.2 07-Jul-2017	S22@0.2 07-Jul-2017	S23@0.2 07-Jul-2017	S24@0.15 07-Jul-2017	S25@0.15 07-Jul-2017
Lab Number:		1806809.21	1806809.22	1806809.23	1806809.24	1806809.25
Individual Tests						
Dry Matter	g/100g as rcvd	91	92	74	95	96
Heavy Metals with Mercury, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	5	4	-	5	4
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	< 0.10	-	< 0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt	4	3	-	3	4
Total Recoverable Copper	mg/kg dry wt	13	8	-	7	8
Total Recoverable Lead	mg/kg dry wt	8.9	6.4	-	6.3	5.5
Total Recoverable Mercury	mg/kg dry wt	< 0.10	< 0.10	-	< 0.10	< 0.10
Total Recoverable Nickel	mg/kg dry wt	4	4	-	5	5
Total Recoverable Zinc	mg/kg dry wt	16	33	-	18	15
BTEX in Soil by Headspace GC-MS						
Benzene	mg/kg dry wt	-	-	< 0.06	-	-
Toluene	mg/kg dry wt	-	-	0.07	-	-
Ethylbenzene	mg/kg dry wt	-	-	< 0.06	-	-
m&p-Xylene	mg/kg dry wt	-	-	< 0.12	-	-
o-Xylene	mg/kg dry wt	-	-	< 0.06	-	-
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.011	< 0.011	-	< 0.011	< 0.011
alpha-BHC	mg/kg dry wt	< 0.011	< 0.011	-	< 0.011	< 0.011
beta-BHC	mg/kg dry wt	< 0.011	< 0.011	-	< 0.011	< 0.011
delta-BHC	mg/kg dry wt	< 0.011	< 0.011	-	< 0.011	< 0.011
gamma-BHC (Lindane)	mg/kg dry wt	< 0.011	< 0.011	-	< 0.011	< 0.011
cis-Chlordane	mg/kg dry wt	< 0.011	< 0.011	-	< 0.011	< 0.011
trans-Chlordane	mg/kg dry wt	< 0.011	< 0.011	-	< 0.011	< 0.011
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	< 0.011	< 0.011	-	< 0.011	< 0.011
4,4'-DDD	mg/kg dry wt	< 0.011	< 0.011	-	< 0.011	< 0.011
2,4'-DDE	mg/kg dry wt	< 0.011	< 0.011	-	< 0.011	< 0.011
4,4'-DDE	mg/kg dry wt	< 0.011	< 0.011	-	< 0.011	< 0.011
2,4'-DDT	mg/kg dry wt	< 0.011	< 0.011	-	< 0.011	< 0.011
4,4'-DDT	mg/kg dry wt	< 0.011	< 0.011	-	< 0.011	< 0.011
Total DDT Isomers	mg/kg dry wt	< 0.07	< 0.07	-	< 0.07	< 0.07
Dieldrin	mg/kg dry wt	< 0.011	< 0.011	-	< 0.011	< 0.011
Endosulfan I	mg/kg dry wt	< 0.011	< 0.011	-	< 0.011	< 0.011
Endosulfan II	mg/kg dry wt	< 0.011	< 0.011	-	< 0.011	< 0.011
Endosulfan sulphate	mg/kg dry wt	< 0.011	< 0.011	-	< 0.011	< 0.011
Endrin	mg/kg dry wt	< 0.011	< 0.011	-	< 0.011	< 0.011
Endrin aldehyde	mg/kg dry wt	< 0.011	< 0.011	-	< 0.011	< 0.011
Endrin ketone	mg/kg dry wt	< 0.011	< 0.011	-	< 0.011	< 0.011

Sample Type: Soil						
Sample Name:		S21@0.2 07-Jul-2017	S22@0.2 07-Jul-2017	S23@0.2 07-Jul-2017	S24@0.15 07-Jul-2017	S25@0.15 07-Jul-2017
Lab Number:		1806809.21	1806809.22	1806809.23	1806809.24	1806809.25
Organochlorine Pesticides Screening in Soil						
Heptachlor	mg/kg dry wt	< 0.011	< 0.011	-	< 0.011	< 0.011
Heptachlor epoxide	mg/kg dry wt	< 0.011	< 0.011	-	< 0.011	< 0.011
Hexachlorobenzene	mg/kg dry wt	< 0.011	< 0.011	-	< 0.011	< 0.011
Methoxychlor	mg/kg dry wt	< 0.011	< 0.011	-	< 0.011	< 0.011
Polycyclic Aromatic Hydrocarbons Screening in Soil						
1-Methylnaphthalene	mg/kg dry wt	-	-	0.026	-	-
2-Methylnaphthalene	mg/kg dry wt	-	-	0.017	-	-
Perylene	mg/kg dry wt	-	-	< 0.014	-	-
Acenaphthylene	mg/kg dry wt	-	-	< 0.014	-	-
Acenaphthene	mg/kg dry wt	-	-	< 0.014	-	-
Anthracene	mg/kg dry wt	-	-	0.039	-	-
Benzo[a]anthracene	mg/kg dry wt	-	-	0.071	-	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	-	-	0.040	-	-
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	-	-	< 0.014	-	-
Benzo[e]pyrene	mg/kg dry wt	-	-	0.030	-	-
Benzo[g,h,i]perylene	mg/kg dry wt	-	-	< 0.014	-	-
Benzo[k]fluoranthene	mg/kg dry wt	-	-	< 0.014	-	-
Chrysene	mg/kg dry wt	-	-	0.069	-	-
Dibenzo[a,h]anthracene	mg/kg dry wt	-	-	< 0.014	-	-
Fluoranthene	mg/kg dry wt	-	-	0.162	-	-
Fluorene	mg/kg dry wt	-	-	0.014	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	-	-	< 0.014	-	-
Naphthalene	mg/kg dry wt	-	-	< 0.07	-	-
Phenanthrene	mg/kg dry wt	-	-	0.152	-	-
Pyrene	mg/kg dry wt	-	-	0.147	-	-
Total Petroleum Hydrocarbons in Soil						
C7 - C9	mg/kg dry wt	-	-	< 8	-	-
C10 - C14	mg/kg dry wt	-	-	< 20	-	-
C15 - C36	mg/kg dry wt	-	-	830	-	-
Total hydrocarbons (C7 - C36)	mg/kg dry wt	-	-	830	-	-

Sample Name:		S26@0.15 07-Jul-2017	S27@0.2 07-Jul-2017	Composite of S1@0.2 & S2@0.2	Composite of S3@0.15 & S4@0.2	Composite of S5@0.15 & S6@0.2
Lab Number:		1806809.26	1806809.27	1806809.36	1806809.37	1806809.38
Individual Tests						
Dry Matter	g/100g as rcvd	91	92	91	92	90
Heavy Metals with Mercury, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	4	4	6	6	7
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt	4	4	5	4	6
Total Recoverable Copper	mg/kg dry wt	7	8	9	8	11
Total Recoverable Lead	mg/kg dry wt	7.2	6.8	10.9	7.8	11.7
Total Recoverable Mercury	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Recoverable Nickel	mg/kg dry wt	5	5	7	6	8
Total Recoverable Zinc	mg/kg dry wt	19	19	26	22	34
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011
alpha-BHC	mg/kg dry wt	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011
beta-BHC	mg/kg dry wt	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011
delta-BHC	mg/kg dry wt	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011
gamma-BHC (Lindane)	mg/kg dry wt	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011
cis-Chlordane	mg/kg dry wt	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011
trans-Chlordane	mg/kg dry wt	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011

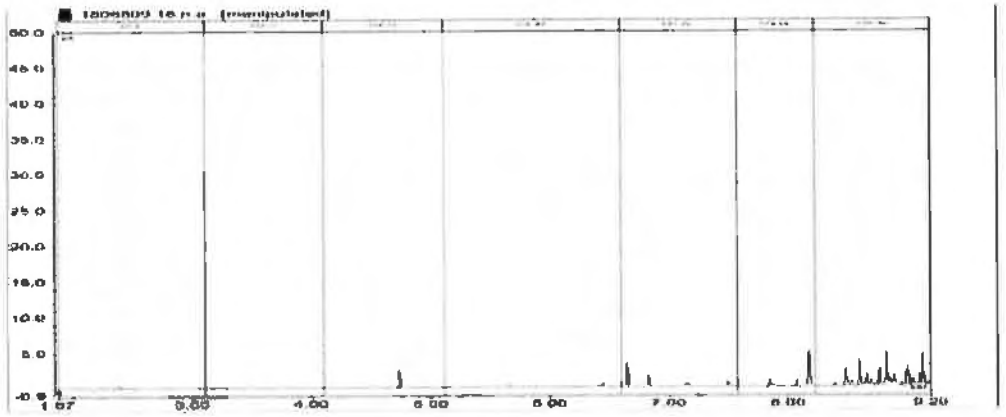
Sample Type: Soil						
Sample Name:		S26@0.15 07-Jul-2017	S27@0.2 07-Jul-2017	Composite of S1@0.2 & S2@0.2	Composite of S3@0.15 & S4@0.2	Composite of S5@0.15 & S6@0.2
Lab Number:		1806809.26	1806809.27	1806809.36	1806809.37	1806809.38
Organochlorine Pesticides Screening in Soil						
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
2,4'-DDD	mg/kg dry wt	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011
4,4'-DDD	mg/kg dry wt	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011
2,4'-DDE	mg/kg dry wt	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011
4,4'-DDE	mg/kg dry wt	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011
2,4'-DDT	mg/kg dry wt	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011
4,4'-DDT	mg/kg dry wt	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011
Total DDT Isomers	mg/kg dry wt	< 0.07	< 0.07	< 0.07	< 0.07	< 0.07
Dieldrin	mg/kg dry wt	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011
Endosulfan I	mg/kg dry wt	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011
Endosulfan II	mg/kg dry wt	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011
Endosulfan sulphate	mg/kg dry wt	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011
Endrin	mg/kg dry wt	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011
Endrin aldehyde	mg/kg dry wt	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011
Endrin ketone	mg/kg dry wt	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011
Heptachlor	mg/kg dry wt	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011
Heptachlor epoxide	mg/kg dry wt	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011
Hexachlorobenzene	mg/kg dry wt	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011
Methoxychlor	mg/kg dry wt	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011

Sample Name:		Composite of S7@0.2 & S8@0.2	Composite of S11@0.2 & S12@0.2	Composite of S13@0.15 & S14@0.2	Composite of S15@0.2 & S16@0.2	Composite of S28@0.2 & S29@0.15
Lab Number:		1806809.39	1806809.40	1806809.41	1806809.42	1806809.43
Individual Tests						
Dry Matter	g/100g as rcvd	92	89	84	87	95
Heavy Metals with Mercury, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	5	7	6	6	4
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	0.16	< 0.10	< 0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt	4	6	6	6	3
Total Recoverable Copper	mg/kg dry wt	8	16	14	12	8
Total Recoverable Lead	mg/kg dry wt	6.2	26	12.5	12.5	6.3
Total Recoverable Mercury	mg/kg dry wt	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Recoverable Nickel	mg/kg dry wt	5	7	7	7	4
Total Recoverable Zinc	mg/kg dry wt	20	67	35	32	20
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.011	< 0.011	< 0.012	< 0.012	< 0.011
alpha-BHC	mg/kg dry wt	< 0.011	< 0.011	< 0.012	< 0.012	< 0.011
beta-BHC	mg/kg dry wt	< 0.011	< 0.011	< 0.012	< 0.012	< 0.011
delta-BHC	mg/kg dry wt	< 0.011	< 0.011	< 0.012	< 0.012	< 0.011
gamma-BHC (Lindane)	mg/kg dry wt	< 0.011	< 0.011	< 0.012	< 0.012	< 0.011
cis-Chlordane	mg/kg dry wt	< 0.011	< 0.011	< 0.012	< 0.012	< 0.011
trans-Chlordane	mg/kg dry wt	< 0.011	< 0.011	< 0.012	< 0.012	< 0.011
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
2,4'-DDD	mg/kg dry wt	< 0.011	< 0.011	< 0.012	< 0.012	< 0.011
4,4'-DDD	mg/kg dry wt	< 0.011	< 0.011	< 0.012	< 0.012	< 0.011
2,4'-DDE	mg/kg dry wt	< 0.011	< 0.011	< 0.012	< 0.012	< 0.011
4,4'-DDE	mg/kg dry wt	< 0.011	< 0.011	< 0.012	< 0.012	< 0.011
2,4'-DDT	mg/kg dry wt	< 0.011	< 0.011	< 0.012	< 0.012	< 0.011
4,4'-DDT	mg/kg dry wt	< 0.011	< 0.011	< 0.012	< 0.012	< 0.011
Total DDT Isomers	mg/kg dry wt	< 0.07	< 0.07	< 0.08	< 0.07	< 0.07
Dieldrin	mg/kg dry wt	< 0.011	< 0.011	< 0.012	< 0.012	< 0.011
Endosulfan I	mg/kg dry wt	< 0.011	< 0.011	< 0.012	< 0.012	< 0.011
Endosulfan II	mg/kg dry wt	< 0.011	< 0.011	< 0.012	< 0.012	< 0.011

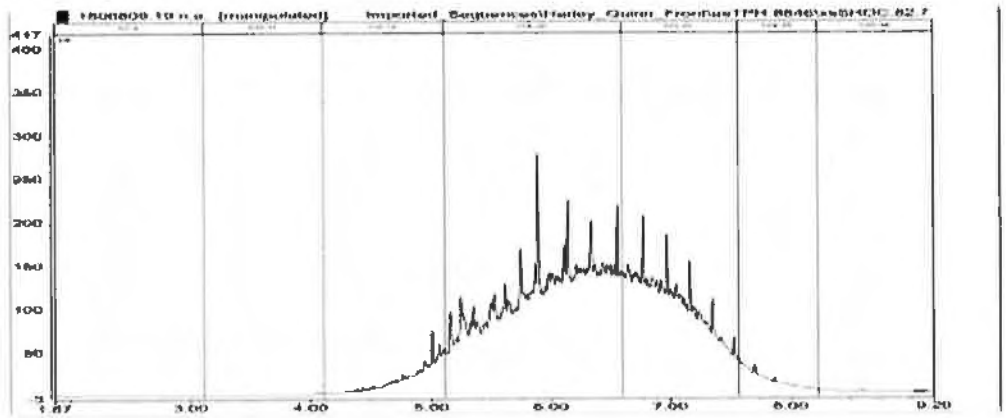
Sample Type: Soil						
Sample Name:		Composite of S7@0.2 & S8@0.2	Composite of S11@0.2 & S12@0.2	Composite of S13@0.15 & S14@0.2	Composite of S15@0.2 & S16@0.2	Composite of S28@0.2 & S29@0.15
Lab Number:		1806809.39	1806809.40	1806809.41	1806809.42	1806809.43
Organochlorine Pesticides Screening in Soil						
Endosulfan sulphate	mg/kg dry wt	< 0.011	< 0.011	< 0.012	< 0.012	< 0.011
Endrin	mg/kg dry wt	< 0.011	< 0.011	< 0.012	< 0.012	< 0.011
Endrin aldehyde	mg/kg dry wt	< 0.011	< 0.011	< 0.012	< 0.012	< 0.011
Endrin ketone	mg/kg dry wt	< 0.011	< 0.011	< 0.012	< 0.012	< 0.011
Heptachlor	mg/kg dry wt	< 0.011	< 0.011	< 0.012	< 0.012	< 0.011
Heptachlor epoxide	mg/kg dry wt	< 0.011	< 0.011	< 0.012	< 0.012	< 0.011
Hexachlorobenzene	mg/kg dry wt	< 0.011	< 0.011	< 0.012	< 0.012	< 0.011
Methoxychlor	mg/kg dry wt	< 0.011	< 0.011	< 0.012	< 0.012	< 0.011

Sample Name:		Composite of S30@0.25 & S31@0.2	Composite of S32@0.15 & S33@0.2	Composite of S34@0.15 & S35@0.2		
Lab Number:		1806809.44	1806809.45	1806809.46		
Individual Tests						
Dry Matter	g/100g as rcvd	93	93	91	-	-
Heavy Metals with Mercury, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	4	6	5	-	-
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	< 0.10	< 0.10	-	-
Total Recoverable Chromium	mg/kg dry wt	3	4	4	-	-
Total Recoverable Copper	mg/kg dry wt	9	8	8	-	-
Total Recoverable Lead	mg/kg dry wt	5.6	7.2	7.1	-	-
Total Recoverable Mercury	mg/kg dry wt	< 0.10	< 0.10	< 0.10	-	-
Total Recoverable Nickel	mg/kg dry wt	4	6	5	-	-
Total Recoverable Zinc	mg/kg dry wt	19	20	17	-	-
Organochlorine Pesticides Screening in Soil						
Aldrin	mg/kg dry wt	< 0.011	< 0.011	< 0.011	-	-
alpha-BHC	mg/kg dry wt	< 0.011	< 0.011	< 0.011	-	-
beta-BHC	mg/kg dry wt	< 0.011	< 0.011	< 0.011	-	-
delta-BHC	mg/kg dry wt	< 0.011	< 0.011	< 0.011	-	-
gamma-BHC (Lindane)	mg/kg dry wt	< 0.011	< 0.011	< 0.011	-	-
cis-Chlordane	mg/kg dry wt	< 0.011	< 0.011	< 0.011	-	-
trans-Chlordane	mg/kg dry wt	< 0.011	< 0.011	< 0.011	-	-
Total Chlordane [(cis+trans)* 100/42]	mg/kg dry wt	< 0.04	< 0.04	< 0.04	-	-
2,4'-DDD	mg/kg dry wt	< 0.011	< 0.011	< 0.011	-	-
4,4'-DDD	mg/kg dry wt	< 0.011	< 0.011	< 0.011	-	-
2,4'-DDE	mg/kg dry wt	< 0.011	< 0.011	< 0.011	-	-
4,4'-DDE	mg/kg dry wt	< 0.011	< 0.011	< 0.011	-	-
2,4'-DDT	mg/kg dry wt	< 0.011	< 0.011	< 0.011	-	-
4,4'-DDT	mg/kg dry wt	< 0.011	< 0.011	< 0.011	-	-
Total DDT Isomers	mg/kg dry wt	< 0.07	< 0.07	< 0.07	-	-
Dieldrin	mg/kg dry wt	< 0.011	< 0.011	< 0.011	-	-
Endosulfan I	mg/kg dry wt	< 0.011	< 0.011	< 0.011	-	-
Endosulfan II	mg/kg dry wt	< 0.011	< 0.011	< 0.011	-	-
Endosulfan sulphate	mg/kg dry wt	< 0.011	< 0.011	< 0.011	-	-
Endrin	mg/kg dry wt	< 0.011	< 0.011	< 0.011	-	-
Endrin aldehyde	mg/kg dry wt	< 0.011	< 0.011	< 0.011	-	-
Endrin ketone	mg/kg dry wt	< 0.011	< 0.011	< 0.011	-	-
Heptachlor	mg/kg dry wt	< 0.011	< 0.011	< 0.011	-	-
Heptachlor epoxide	mg/kg dry wt	< 0.011	< 0.011	< 0.011	-	-
Hexachlorobenzene	mg/kg dry wt	< 0.011	< 0.011	< 0.011	-	-
Methoxychlor	mg/kg dry wt	< 0.011	< 0.011	< 0.011	-	-

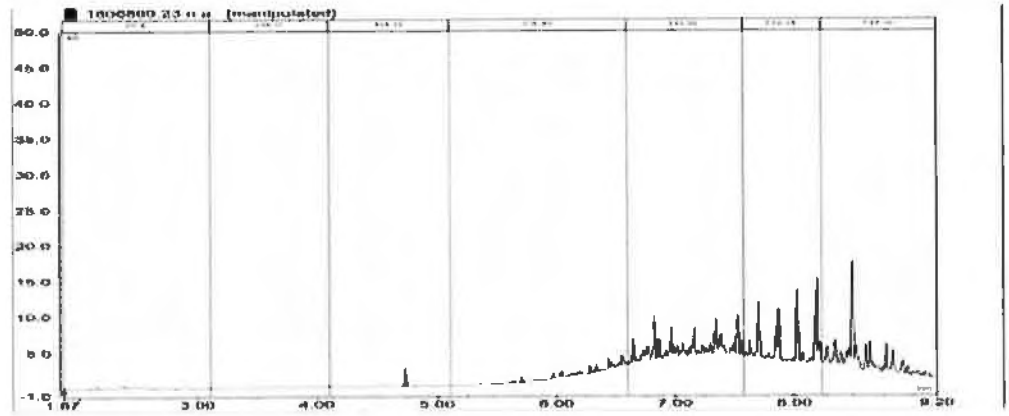
1506809.18
S18@0.2 07-Jul-2017
Client Chromatogram for TPH by FID



1506809.19
S19@0.15 07-Jul-2017
Client Chromatogram for TPH by FID



1506809.23
S23@0.2 07-Jul-2017
Client Chromatogram for TPH by FID



Analyst's Comments

It was observed that the container for sample 1806809/18 was not completely filled. Volatile loss may have occurred due to the headspace created in the container.

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**
Heavy Metals with Mercury, Screen Level	Dried sample, < 2mm fraction. Nitric/Hydrochloric acid digestion US EPA 200.2. Complies with NES Regulations. ICP-MS screen level, interference removal by Kinetic Energy Discrimination if required.	0.10 - 4 mg/kg dry wt	17, 20-22, 24-27, 36-46
BTEX in Soil by Headspace GC-MS	Solvent extraction, Headspace GC-MS analysis US EPA 8260B. Tested on as received sample [KBIs:5782,26687,3629]	0.05 - 0.10 mg/kg dry wt	9, 18-19, 23
Organochlorine Pesticides Screening in Soil	Sonication extraction, SPE cleanup, dual column GC-ECD analysis (modified US EPA 8082). Tested on as recieved sample	0.010 - 0.06 mg/kg dry wt	17, 20-22, 24-27, 36-46
Polycyclic Aromatic Hydrocarbons Screening in Soil	Sonication extraction, Dilution or SPE cleanup (if required), GC-MS SIM analysis (modified US EPA 8270). Tested on as received sample. [KBIs:5786,2805,2695]	0.010 - 0.05 mg/kg dry wt	23
Total Petroleum Hydrocarbons in Soil	Sonication extraction in DCM, Silica cleanup, GC-FID analysis US EPA 8015B/M/E Petroleum Industry Guidelines. Tested on as received sample [KBIs:5786,2805,10734]	8 - 60 mg/kg dry wt	9, 18-19, 23
TPH + PAH + BTEX profile	Sonication extraction, SPE cleanup, GC & GC-MS analysis	0.010 - 60 mg/kg dry wt	23
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry), gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed). US EPA 3550.	0.10 g/100g as rcvd	9, 17-27, 36-46
Composite Environmental Solid Samples*	Individual sample fractions mixed together to form a composite fraction.	-	1-8, 11-16, 28-35
1-Methylnaphthalene	Sonication extraction, SPE cleanup, GC-MS SIM analysis. Modified US EPA 8270.	0.010 mg/kg dry wt	23
2-Methylnaphthalene	Sonication extraction, SPE cleanup, GC-MS SIM analysis. Modified US EPA 8270.	0.010 mg/kg dry wt	23
Perylene	Sonication extraction, SPE cleanup, GC-MS SIM analysis. Modified US EPA 8270.	0.010 mg/kg dry wt	23

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.

This report must not be reproduced, except in full, without the written consent of the signatory.

Ara Heron BSc (Tech)
Client Services Manager - Environmental

wsp

wsp.com/nz

Appendix 'I'

Infrastructure Assessment

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MOLYNEUX LIFESTYLE VILLAGE LTD

REQUEST FOR A CHANGE TO THE OPERATIVE CENTRAL OTAGO DISTRICT PLAN INFRASTRUCTURE REPORT

PROJECT:	Dunstan Road, Alexandra, Request for a Change to the Operative Central Otago District Plan
PRINCIPAL:	Molyneux Lifestyle Village Ltd
OUR REF:	A4814
DATE:	February 2021

DUNEDIN: P.O. Box 5933, Dunedin 9058. **T** 03 477 3245
CHRISTCHURCH: P.O. Box 160094, Christchurch 8441. **T** 03 928 1533
ALEXANDRA: P.O. Box 103, Alexandra 9340. **T** 03 448 8775
CROMWELL: P.O. Box 84, Cromwell 9342. **T** 03 445 1826
QUEENSTOWN: P.O. Box 2645, Queenstown 9349. **T** 03 441 4715
WANAKA: P.O. Box 283, Wanaka 9305. **T** 03 443 0110

PATERSONPITTSGROUP

REVISION / APPROVAL PANEL

Rev:	Date:	Prepared By:	Reviewed By:	Comments:
0	1 Feb 2020	MG	PLD	Initial Draft
1	27.Feb 2020			Final

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Job No:	A4814
Date	27 February 2021
Report Prepared For	Molyneux Lifestyle Village Ltd

Table of Contents

1.0 Scope

Paterson Pitts Limited Partnership (PPLP) has been engaged by Molyneux Lifestyle Village Ltd to provide an infrastructure report to support a private plan change request that seeks to re-zone 16ha of land at Dunstan Road, Alexandra from Rural Residential Resource Area to a "large lot" Residential Resource Area.

A total of approximately 60 dwelling units is planned, plus an existing winery is to be retained.

This report covers the availability of the following infrastructure elements.

- Wastewater
- Stormwater
- Water Supply – Potable, Firefighting
- Network Utility Services (electricity and telecommunications)
- Road construction

2.0 Executive Summary

2.1 Stormwater

The site is underlain by a considerable depth of glacial out wash gravels, with depths to groundwater varying from 10-15 metres below ground level. Soakage tests have shown these gravels to be highly permeable. No issues are anticipated with the discharge of stormwater from roading, hand stand and roof-run off direct to ground via suitably designed soak pits, as is the norm for all land development within the Clyde – Alexandra area.

2.2 Wastewater

Computer modelling of the Alexandra wastewater reticulation by Mott MacDonald NZ Ltd shows that the site can be adequately serviced from the existing town reticulation. Relocation of the winery waste disposal field will require a discharge resource consent from the Otago Regional Council.

2.3 Water Supply

Computer modelling of the Alexandra water reticulation by Mott MacDonald NZ Ltd shows that the site can be adequately serviced from the existing town reticulation

2.4 Network Utility Services

Chorus New Zealand Ltd have confirmed that a suitable telecommunications (fibre) supply can be made available to the proposed development of the site.

Aurora Energy Ltd have advised that a suitable power supply can be made available to serve the proposed development of the site.

2.5 Road Construction

All roads will be constructed on sand and gravels. Bearing capacity tests on likely road subgrades were within the limits for an acceptable pavement design. No issues are expected with designing and constructing road pavements in compliance with the procedures of "Austroads" and the subdivisional pavement design standards of the Central Otago District Council. Road cross-section designs and geometry are anticipated to be in accordance with "Austroads" and NZS 4404:2010.

3.0 Stormwater

There is no reticulated stormwater system in the area.

Analysis of drill hole logs in the locality show that the site is underlain by a considerable depth of glacial outwash sand and gravel with depth to groundwater between 10-15 metres below the ground surface. A grid of six test pits on the site were done by Paterson Pitts which show near surface topology to be 0.2m of topsoil over outwash sands and gravel, down to the 2.5m depth of all test pits.

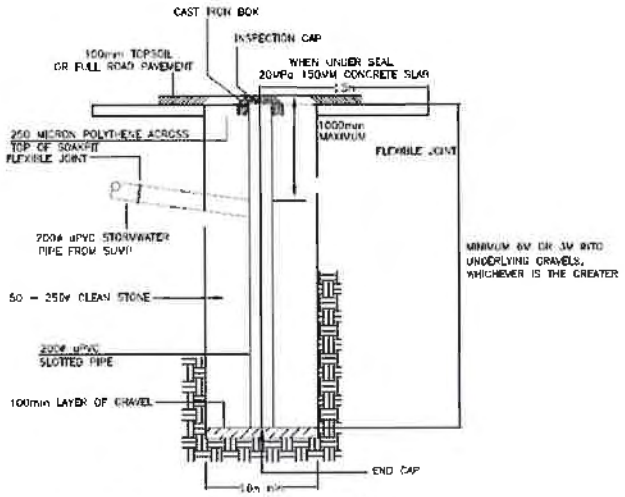
Test pit logs are attached in **Appendix (A).**

Soakage tests were carried out on TP's 1, 4 & 5. Infiltration rates of 3000mm/hr (1.37 litres/sec/m^2), 2640mm/hr (1.32 litres/sec/m^2),) & 2520m/hr (1.26 litres/sec/m^2) respectively were recorded. This equates to an average soakage rate of a "Cauldwell" type soak pit of 19 litres/sec.

The NIWA HIRDS program was used to calculate a 2% Annual Exceeding Probability (AEP) short duration rainfall event of 58mm/hr using a 2 deg temperature risk factor to allow for climate change. This means that every 150m of a 10m wide road carriageway will be able to be drained by a single "Caudwell" type soak pit.

This is a very conservative assessment as Council's Engineering Standards require a pair of sumps to drain each 90m length of road and the road carriageway is likely to be 8.5m wide. Soakage tests, infiltration calculations and rainfall intensity calculations are attached in **Appendix (B)**

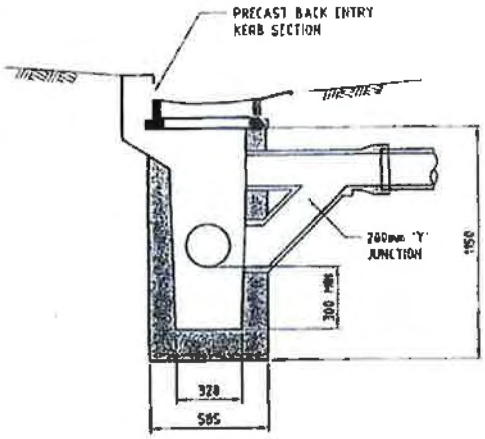
Direct discharge to ground for stormwater from roading, impermeable surfaces and roof run-off will therefore be possible. The standard roading solution acceptable to Council is a "Cauldwell type" soak pit, one per sump outlet. This method of stormwater disposal is universally used for land development over glacial outwash gravels in Cromwell, Alexandra and Clyde. See Fig 1.



CAULDWELL SOAKPIT DETAIL

Fig 1

In order to comply with the Regional Water Plan rules, a silt and debris trap is required before discharge of stormwater to a soak pit. This will be provided by a "inverted syphon" type mud tank. See Fig 2.



TYPICAL SUMP DETAIL

Fig 2

Where road swales are used, these provide a measure of pre-treatment of stormwater before discharge into mud tanks. There is a depth of at least 10m of gravel and sand below each soak pit, which will further filter stormwater before it is eventually discharged to groundwater. The inverted siphon mud tank/Caudwell soak pit system effectively provides for 3 stage treatment of stormwater. The mud tank (which is periodically sucked out by Council) removes silt, trash and gross pollutants, while the Caudwell soak pit (also periodically sucked out by Council) provides secondary treatment by removing finer silt and debris, with the 10m of sand and gravel below the soak pit providing tertiary filtration

For roof-run off, Council has a "rule of thumb" that 1m3 of soak pit is required for every 50m2 of roof area draining into the soak pit.

The site is flat. This means there will be a lack of secondary flow paths. From a stormwater/road design aspect this means that most roads will need to be cut into the surrounding terrain by a least 150-300 mm in order to provide longitudinal road drainage and for dwellings to be able to comply with Building Code requirements (E1/AS1) for minimum floor levels above the road crown. See Fig 3

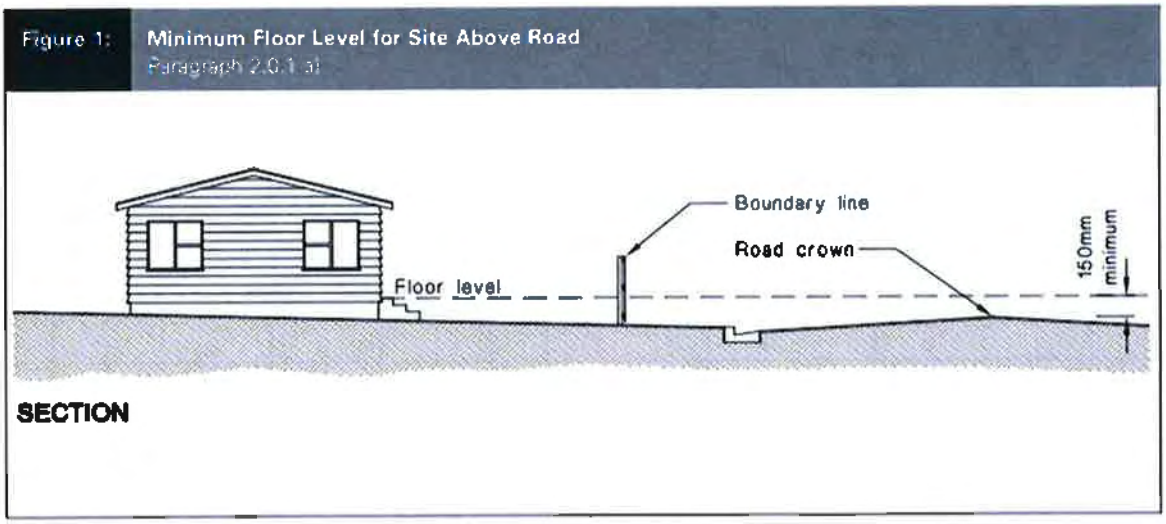


Figure 3

Essentially the roads act as temporary overflow ponding areas in the event of exceptional rain events and/or occasional blockage of mud tanks and soak pits.

Given the very large lot sizes (in excess of 2000m^2), site coverage is expected to be only 20%, at a maximum. No difficulty is therefore anticipated with on-site disposal of stormwater either direct to ground by soak pit or by storage and attenuation and application as garden and lawn irrigation.

4.0 Wastewater

A report by Mott MacDonald has been commissioned by the Central Otago District Council to assess this proposed development. The report is attached at **Appendix 'C'**.

A connection to the new trunk main between Clyde and Alexandra constructed along Dunstan Road/Central Otago Rail Trail corridor is not possible.

The option of connecting the development to the existing Alexandra Wastewater reticulation at a manhole at the end of Henderson Drive (adjacent to 36 Henderson Drive) will not have an adverse effect on the existing system.

The report also modelled a scenario whereby the whole of Dunstan Road from the Alexandra Town Boundary to Waldron Road was rezoned to provide for a maximum of 300 lots. This resulted in a pipe surcharge well down stream of Henderson Drive (a 300mm trunk main at 1 Dunorling Street).

The development will require the relocation of the existing winery waste disposal field, currently located adjacent to Dunstan Road, to within an allotment set aside for the winery which it is understood will continue to process grapes sourced from off-site. This will require a discharge consent from the Otago Regional Council.

5.0 Water Supply

5.1 Irrigation

From the Otago Regional Council's "grow Otago" data base:

- "Dry summer rainfall" is 61-80mm for the Alexandra – Clyde Basin
- "Median potential evapotranspiration" (Jan-Feb) is 206-210mm for the Basin

Irrigation will therefore be essential to establish and maintain grass growth and landscaping within the development. This is particularly so given the very low Plant Available Water (PAW) of the site, due to its light sandy/gravelly soils.

Given the very large lot sizes and the site's proximity to the existing public open space and recreation facilities at Molyneux Park and the Alexandra Golf Course, it is not anticipated that there will be any requirement for public open space to be provided within the development.

There is an on-site bore located within the site, which Molyneux Lifestyle Village Ltd has a water right from the Otago Regional Council for 80m3/day. See RM 2001.148 at **Appendix 'G'**.

Peak irrigation for lawn and garden and domestic water requirements within private allotments of 2000m2 will typically be up to 5,000L/day with a metered supply. The Mott MacDonald modelling scenario allowed 1500L/day/lot with a peak hourly demand of 5.

The "shortfall" in peak irrigation demand is therefore 5000L/lot/day x 60 = 21m^3/day. It is intended that a separate irrigation supply be made available to each lot from the bore. The bore will also be used to supply the winery with processing water.

The bore cannot be used for a domestic water supply because of the risk of contamination from the relocated winery waste water disposal field nearby. There is also no suitable location for a reservoir to furnish a gravity supply at sufficient pressure and a firefighting reserve.

5.2 Domestic and Firefighting

The Mott MacDonald report finds that a DN315 pipeline connection to the existing Council main in Dunstan Road, near 99 Russel Street, will supply the development with a FW2 (standard household with no sprinkler system) standard to SNZ-PAS 4509 with no detrimental effect on the existing Alexandra town reticulation. Connection to the new trunk main between Clyde and Alexandra along Dunstan Road/ Rail Trail corridor is not possible. A DN 315mm pipeline would also service a development of 300 lots along Dunstan Road to a FW2 standard with no detrimental effects on the existing town reticulation.

6.0 Network Utility Services

6.1 Telecommunications

Chorus New Zealand Ltd have confirmed that a suitable Air Blown Fibre (ABF) reticulation can be supplied to the proposed development. See **Appendix 'D'.**

Individual home owners will also have the alternative option of the cellular network and several wi-fi providers for their telecommunications and computer media service

6.2 Electricity

Aurora Energy Ltd have confirmed that a suitable power supply can be made3 available to service development of the site See **Appendix 'E'.** To preserve the semi-rural nature of the development, and the night sky, it is not envisaged that street lighting will be provided.

7.0 Road Construction

No difficulty is expected in designing and constructing suitable road pavements within the site, in compliance with "Austroads" and the subdivision engineering design standards of the Central Otago District Council.

All roads will be formed on silty sand and gravel. Laboratory Soaked California Bearing Ratio (CBR) tests were taken at the likely road subgrade at all test pits. See **Appendix 'F'**. Soaked CBR's varied from 6%-18%, all within the limits for an acceptable pavement design in terms of the "Austroads" standard.

Council's current subdivisional roading engineering design standard is NZ 4404:2004 and its July 2008 amendments thereto. However it is proposed that road designs on any subsequent subdivision and development of the site be in accordance with the updated version of this standard, being NZS 4404:2010. This updated version of the standard provides for a more innovative and flexible approach to road layout designs, in accordance with the contemporary urban design concepts proposed for this development. To quote from the forward to NZS 4404:2010:

"Aims to encourage good urban design and remove road blocks to liveability and economic development in communities.
Road design needs to allow 'context' or 'place' to be given significant emphasis, and to require roads to achieve safe (slower) operating speeds;
Innovative subdivision has been discouraged to some extent under the 2004 version of NZS 4404.
The review committee therefore challenged itself to produce a new Standard that:
Encourages sustainable and modern design;
Provides some certainty for designers and TAs; and
Prevents the outcomes that can arise when the sole focus is cost minimisation, and adherence to minimum standards."

and from the outcome statement

"This Standard provides local authorities, developers, and their professional advisors with standards for design and construction of land development and subdivision infrastructure. NZS 4404:2010 encourages sustainable development and modern design that emphasises liveability and environmental quality. It will also provide as much consistency as possible on land development and subdivision infrastructure while still allowing flexibility for local variations to suit local circumstances."

This is a matter that is best addressed at the subsequent resource consent and detailed engineering design stages, rather than at this initial plan change stage. Given that the large lot size and semi-rural nature of the development, it is anticipated that grassed swales will be used instead of kerb and channel, in compliance with low impact urban and design and development (LIUDD) principals.

Swales provide a "softer" more rural edge to road pavements than kerbs and channel and a measure of pre-treatment of stormwater run-off from road pavements.

8.0 Conclusion

Suitable provision can be made for roading, stormwater, wastewater, irrigation and domestic water supply and network utility services to the proposed development.

Myles Garmonsway
Principal, B.Sc, Dip Mgt, R.P. Surv, MNZIS, CSNZ
Paterson Pitts Limited Partnership (Cromwell)

APPENDIX A

Test Pit Logs

TEST PIT 1

Ground	0.00	
		Organics / Topsoil
	-0.10	
		Clean sands, soft, medium grained
	-1.30	
		Sandy gravels.
	-0.60	
		Clean sands, Medium to coarse
	-1.00	
		Semi-compact, sandy gravels. <40mm
	-2.20	

LOCATION:

LINDIS PEAK 2000		NZTM		
mN	mE	mN	mE	NAME
745361	392750	4985480	1315439	TP 1

TEST PIT 2

Ground	0.00	
		Organics / topsoil
	-0.20	
		Gravels
	-0.30	
		Firm sandy silts
	-0.90	
		Coarse, clean sands
	-1.40	
		Sandy gravels. Compact <40mm
	-2.50	

LOCATION:

LINDIS PEAK 2000		NZTM		
mN	mE	mN	mE	NAME
745511	392918	4985637	1315600	TP 2

TEST PIT 3

Ground	0.00	
		Organics/ topsoil
	-0.10	
		Sandy gravels
	-0.30	
		Clean, fine to medium sands some roots <20mm dia
	-0.90	
		Loose, sandy gravels <30mm
	-1.50	
		Coarse gravels compact <75mm
	-2.00	

LOCATION:

LINDIS PEAK 2000		NZTM		
mN	mE	mN	mE	NAME
745267	392845	4985390	1315538	TP 3

TEST PIT 4

Ground 0.00

Organics/ topsoil

-0.10

clean, soft, sands. meduim grained

-0.70

Coarse sands in fine gravels.

Occasional <75mm stones

-2.20

LOCATION:

LINDIS PEAK 2000		NZTM		
mN	mE	mN	mE	NAME
745354	392949	4985482	1315638	TP 4

TEST PIT 5

Ground	0.00	
		Organics / topsoil
	-0.15	
		Silty gravels
	-0.40	
		clean sands
	-0.60	
		Sandy gravels
	-0.90	
		Clean sands
	-1.20	
		Sandy gravels
	-1.40	
		Medium gravels <50mm compact
	-2.40	

LOCATION:

LINDIS PEAK 2000		NZTM		
mN	mE	mN	mE	NAME
745106	392970	4985235	1315670	TP 5

TEST PIT 6

Ground 0.00

organics / topsoil
-0.10

Silty sands
-0.40

silty gravels
-0.50

Clean sands medium to coarse
-1.00

Sandy gravels
< 30mm
compact
Poor cohesion
-2.30

LOCATION:

LINDIS PEAK 2000		NZTM		
mN	mE	mN	mE	NAME
745280	393158	4985416	1315850	TP 6

APPENDIX B

Soakage Tests & Infiltration Calculations

Pit Dimensions			Area		Test Pit	1			A4814								
Length	2.1		2.1						Dunstan Rd								
Width	1																
Time (s)	Depth	dVolume	dTime (s)		Soakage (l/s)		l/s/m²										
0	0	-0.1155	60		-1.9		-0.9										
60	0.055	-0.0945	60		-1.6		-0.8										
120	0.1	-0.105	60		-1.8		-0.8										
180	0.15																
			0							Soaking	Infiltration Rate			3000	mm/hr		
				Average	-1.75		-0.83										
		0.315	180		1.8		0.8	For time period		Total Soakage Rate		(overall)		1.37	l/s/m²		
Note:	5000	l poured in over 21 minutes to get to water depth of				0.64	m			Filling	Infiltration Rate			4974	mm/hr		
	Soakage over 21 min =		3656	litres													
		=	2.901587	(l/s)						Weighted	Soakage Rate			1.03	mm/hr		
		=	1.38	l/s/m²													
														total volume			
	1 in 20 (RCP4.5)									area m2	1548			12.098	m3		
	9.77	mm in 10 minutes		58.6 mm/hr		Q=2.78CiA				runoff	0.8			rate per second			
						A = Q/2.78iC		0.154779	ha	depth	9.77			20.2	l/s		
								1548	m²	seconds	600						
													runoff per m2 per s		0.013	l/s/m2	
Soakpit Base =			0.785398	m2						Soakage Capacity			1549	m2			
Effective soakage @ 2m deep			19.63495	m2	45 deg angle influence					metres of road			154.9	310	two sided		
			20.17868		Soakage Rate	l/s				(10m carriageway / footpath)							

Pit Dimensions			Area		Test Pit	4			A4814							
Length	2.3		2.3						Dunstan Rd							
Width	1															
Time (s)	Depth	dVolume	dTime (s)		Soakage (l/s)		l/s/m²									
0	0	-0.0575	60		-1.0		-0.4									
60	0.025	-0.1265	60		-2.1		-0.9									
120	0.08	-0.1035	60		-1.7		-0.8									
180	0.125	-0.115	60		-1.9		-0.8									
240	0.175	-0.1035	60		-1.7		-0.8			Soaking	Infiltration Rate			2640	mm/hr	
300	0.22			Average	-1.69		-0.73									
		0.506	300		1.7		0.7	For time period		Total Soakage Rate		(overall)		1.32	l/s/m²	
Note:	5000	l poured in over 20 minutes to get to water depth of				0.42	m			Filling	Infiltration Rate			5262	mm/hr	
	Soakage over 20 min =		4034	litres												
		=	3.361667	(l/s)						Weighted	Soakage Rate			0.99	mm/hr	
		=	1.46	l/s/m²												
													total volume			
	1 in 20 (RCP4.5)									area m2	1486			11.618	m3	
	9.77	mm in 10 minutes		58.6 mm/hr		Q=2.78CiA				runoff	0.8		rate per second			
						A = Q/2.78iC		0.148644	ha	depth	9.77			19.4	l/s	
								1486	m²	seconds	600					
												runoff per m² per s			0.013	l/s/m²
Soakpit Base =			0.785398	m2						Soakage Capacity		1488	m2			
Effective soakage @ 2m deep			19.63495	m2	45 deg angle influence					metres of road		148.8		298	two sided	
			19.37885		Soakage Rate	l/s				(10m carriageway / footpath)						

Pit Dimensions			Area		Test Pit	5			A4814								
Length	2.3		2.3						Dunstan Rd								
Width	1																
Time (s)	Depth	dVolume	dTime (s)		Soakage (l/s)		l/s/m²										
0	0	-0.1265	60		-2.1		-0.9										
60	0.055	-0.115	60		-1.9		-0.8										
120	0.105	-0.0805	60		-1.3		-0.6										
180	0.14	-0.0805	60		-1.3		-0.6										
240	0.175	-0.0805	60		-1.3		-0.6				Soaking	Infiltration Rate			2520	mm/hr	
300	0.21			Average	-1.61		-0.70										
		0.483	300		1.6		0.7	For time period			Total Soakage Rate		(overall)		1.26	l/s/m²	
Note:	5000	l poured in over 21 minutes to get to water depth of				0.5	m				Filling	Infiltration Rate			4783	mm/hr	
	Soakage over 21 min =		3850	litres													
		=	3.055556	(l/s)							Weighted	Soakage Rate			1.00	mm/hr	
		=	1.33	l/s/m²													
														total volume			
	1 in 20 (RCP4.5)										area m2	1513			11.828	m3	
	9.77	mm in 10 minutes		58.6 mm/hr		Q=2.78CiA					runoff	0.8		rate per second			
						A = Q/2.78iC		0.151324	ha		depth	9.77			19.7	l/s	
								1513	m²		seconds	600					
													runoff per m2 per s			0.013	l/s/m2
Soakpit Base =			0.785398	m2							Soakage Capacity		1514	m2			
Effective soakage @ 2m deep			19.63495	m2	45 deg angle influence						metres of road		151.4		303	two sided	
			19.72829		Soakage Rate	l/s					(10m carriageway / footpath)						

APPENDIX C

Water & Wastewater Impact Assessment

MOTT MACDONALD

Technical Memo
Central Otago District Council

Project:	Proposed development query: Molyneux Lifestyle Village in Alexandra		
Our reference:	385321	**Revision:**	B - draft
Prepared by:	Hannah Law & Giulio Pozzuto	**Date:**	19 November 2020
Approved by:	Julie Plessis	**Checked by:**	Tom Lecomte
Subject:	269 Dunstan Road: water supply and wastewater infrastructure assessment		

In October 2020, Mott MacDonald was commissioned by Central Otago District Council (CODC) to assess the system performance of the water supply (WS) and wastewater (WW) networks; specifically, at the location of the proposed Molyneux Lifestyle Village (MLV), in Alexandra. The development consists of a total of 60 residential units, which has been modelled using the Lake Dunstan (Alexandra and Clyde) models.

1 Background

1.1 Background and Disclaimer

The Alexandra WS model was built by Rationale in 2014 and reviewed by Mott MacDonald in 2017. The WS Alexandra model was merged with the Clyde model and renamed Lake Dunstan WS model. Mott MacDonald carried out the model update using the latest GIS data and recalibrated the model in 2019.

The Alexandra WW model was built by Rationale in 2015 and reviewed by Mott MacDonald in 2017. Some critical issues were highlighted, and a model update was carried out by Mott MacDonald in 2018. However, the Alexandra WW model has not been recalibrated.

The information and recommendations presented within this assessment are dependent upon the accuracy and reliability of the existing hydraulic models and the data available to Mott MacDonald at the time of the assessment. This technical note has been prepared to assess the impact of the proposed development WS demands and WW discharge on the existing Alexandra WS and WW networks.

Mott MacDonald has followed the accepted procedure in providing the services but given the residual risk associated with any prediction, Mott MacDonald takes no liability for, and gives no warranty against, the consequences of wastewater overflows in relation to the performance of the service and damage to any property (client's or third party). Any third-party developing detailed design should not rely on assumptions made in this report but should satisfy themselves in that regard.

1.2 Development Location

The document summarises the results of the assessment undertaken for the proposed MLV development at 269 Dunstan Road, which is situated immediately northbound of the Alexandra township. The development will be serviced via the Alexandra WS and WW network schemes, which can both be seen in Figure 1-1 and Figure 1-2, respectively.

Figure 1-1: Proposed development and the Alexandra WS network

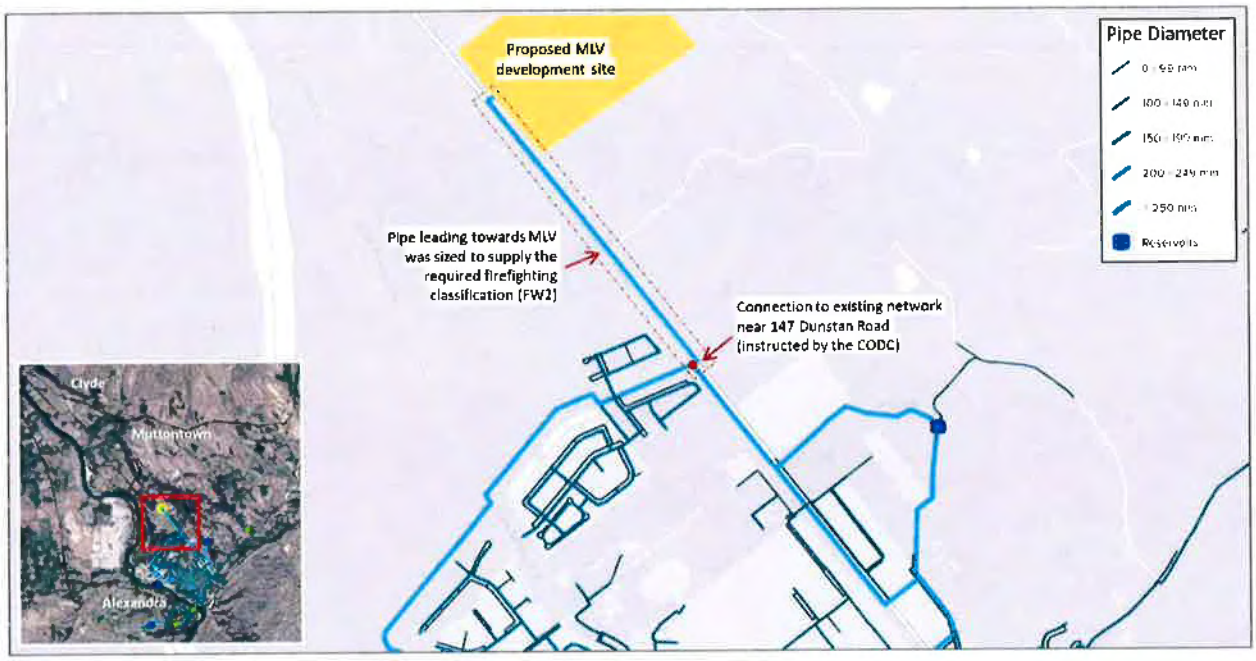
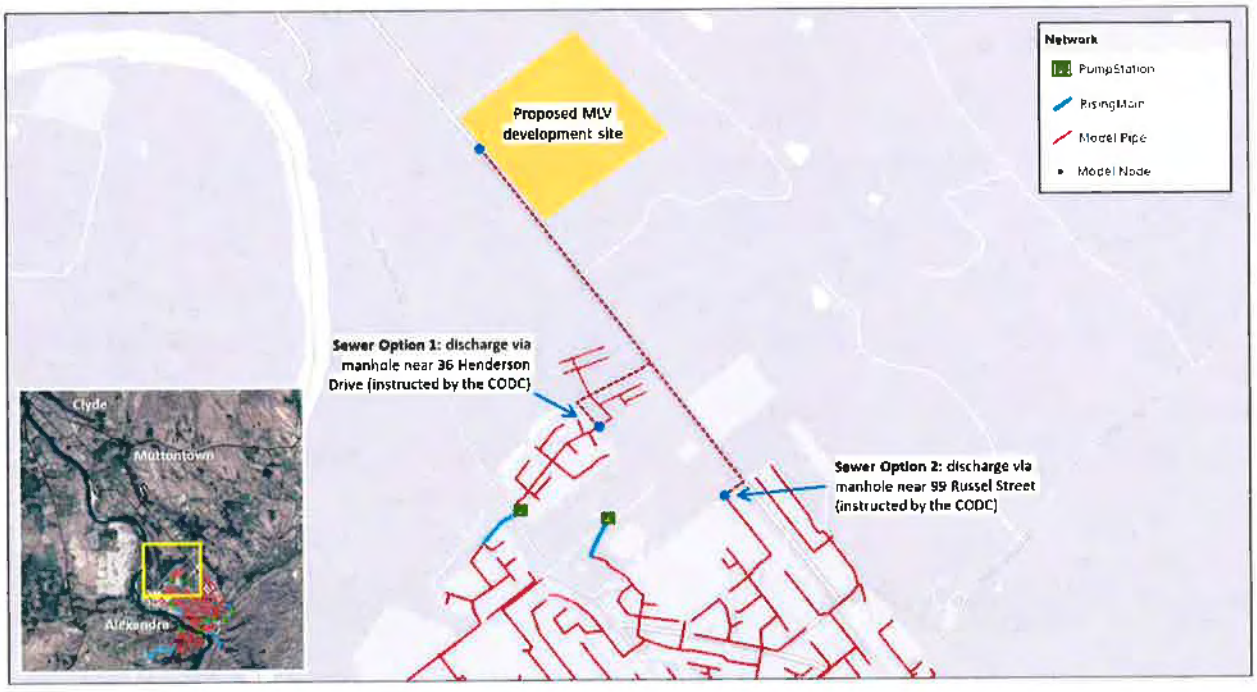


Figure 1-2: Proposed development and the Alexandra WW network



As part of the WS and WW infrastructure assessment, a system performance analysis (SPA) has been undertaken within the two Alexandra networks. The analysis consists in reviewing the network capacities both prior and post-development, determining whether the levels of services (LOS) can be maintained (WS LOS detailed in Section 2.2), and assess the overall impact upon the two networks. However, as they were not finalised, the internal networks within the proposed MLV development were not assessed for both the WS and WW reticulations.

The WS network analysis also involves the firefighting (FF) capability testing. Additionally, the minimum pipe size required along Dunstan Road (Figure 1-1) has also been determined as part of this assessment, in order to adequately supply the proposed development and provide the required FF (25 l/s – FW2).

2 Modelling assumption

2.1 Demand and discharge calculations

As informed by the New Zealand Standards (4404:2010) and the CODC addendum, the WS demand was calculated using the criteria listed below and the results are tabulated in Table 2.1.

- Persons per lot: 3
- Daily consumption: 500 litres/person/day
- Total number of lots: 60
- Residential peak hour factor: 5

Table 2.1: WS demand at the proposed MVL development

	Daily flow (m^3/d)	Instantaneous peak demand (l/s)
Total demand	90	5.21

The WW discharges for the proposed development were calculated in accordance with New Zealand Standard for Land Development and Subdivision Infrastructure (NZS 4404:2010) and the CODC Addendum to NZS 4404:2010 (dated July 2008). The calculated wastewater loads for the development are summarised below in Table 2.2. These demands are based on the following assumptions:

- Persons per lot: 3
- Total number of lots: 60
- Residential peaking factor: 2.5
- Wastewater daily demand: 250 litres/person/day
- Infiltration and inflow peaking factor: 2

Table 2.2: WW discharge at the proposed MVL development

Catchment	Number of lots	Assumed population	Peak Dry Weather Flow (PDWF) (l/s)	Peak Wet Weather Flow (PWWF) (l/s)
Molyneux Lifestyle Village	60	180	1.30	2.60

2.2 LOS and FF requirements

As informed by the New Zealand Standards (4404:2004) and the CODC addendum, the following standards and levels of service have been used for WS network:

- The required operating pressure must fall between 30-80 metres
- The head losses through pipes must be no greater than:
  - 5 m/km in pipes smaller than DN 150 mm
  - 3 m/km in pipes greater than DN 200 mm

- The firefighting water standard for this study is FW2 (no sprinkler system) and all lots must be located within a 90 metres-radius from a hydrant (compliant with SNZ PAS 4509).
  - Importantly, the location of hydrants surrounding the proposed development remains unknown.

2.3 Scenario investigated and confirmed developments

The following two scenarios (including the demand associated with developments on Ngapara Street and Henderson Drive) were considered in the modelling of the WS and WW networks and determined the base scenario for this assessment:

- **WS**: Calibration scenario (including Ngapara Street and Henderson Drive).
- **WW**: Uncalibrated base scenario (including Ngapara Street and Henderson Drive).

Continually, to assess the impact of the proposed MLV development upon the existing Alexandra WW network, the following scenarios were modelled using Mike Urban 2020:

- **Base model (pre-development scenario):**
  - Dry Weather Flow (DWF) scenario
  - 10-Year Average Recurrence Interval (ARI) Wet Weather Flow (WWF) scenario
- **Post-development Option 1 model:**
  - DWF scenario
  - 10-Year ARI WWF scenario
- **Post-development Option 2 model:**
  - DWF scenario
  - 10-Year ARI WWF scenario

2.4 Network setup and connection points

As instructed by the CODC, the following configurations were used for WS and WW:

WS network and connection point

- A watermain will be built along Dustan Road, in order to supply the proposed development;
- The proposed connection point will be situated at 269 Dunstan Road;
- Connection to the network is not possible via the future trunk main between Clyde and Alexandra;
- See Figure 1-1.

WW network and connection point(s)

- Two rising main options have been provided by the council. Both options consist of a new pump station and rising main to enable discharge from the development into the existing Alexandra network.
- The proposed discharge point will be situated at 269 Dunstan Road and will be connected to the network via one of the following two options:
  - **Sewer Option 1**: 36 Henderson Drive
  - **Sewer Option 2**: 99 Russel Street
- Connection to the network is not possible via the future trunk main between Clyde and Alexandra;
- See Figure 1-2.

2.5 Site elevation

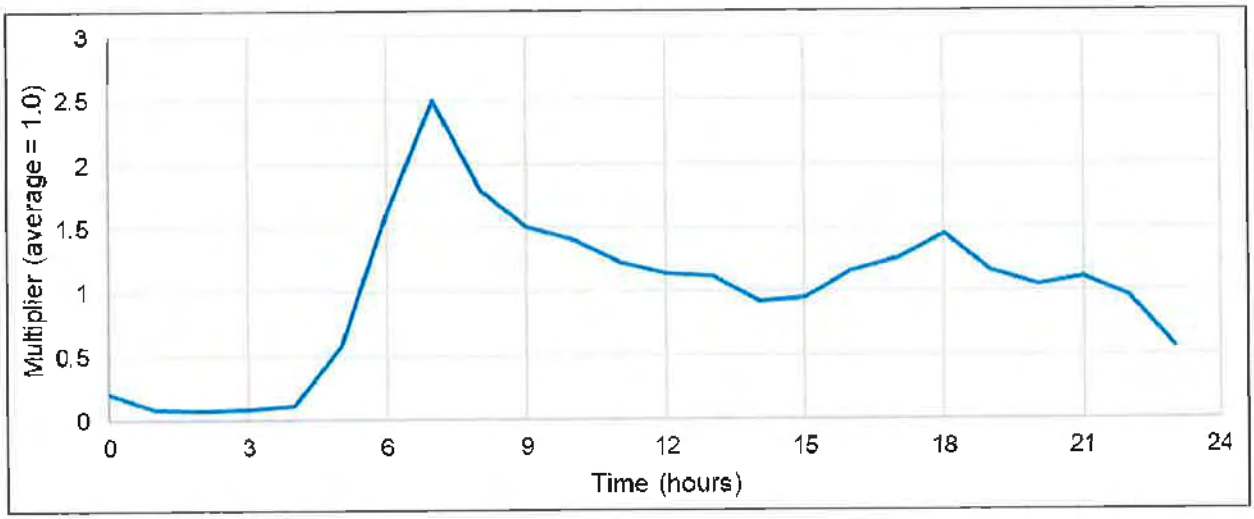
As informed by the 'A4814_PLAN_1A_Modelling' drawing, provided by the CODC; the recorded elevation at the point of connection and discharge is 155.75 mRL and the highest elevation within the development is 156.15 mRL (northern boundary of the proposed MLV development site).

2.6 WW model build assumptions

For the MLV wastewater model, the following assumptions have been made:

- The MLV pump station is assumed to have a fixed pump rate of 5 l/s and have no storage in the wet well.
- A standard residential 24-hour diurnal profile, with a peak factor of 2.5, has been assumed for the proposed MLV wastewater flows. The diurnal profile used for the proposed development is shown in Figure 2-1 below.

Figure 2-1: Residential diurnal profile in Alexandra WW network



3 Modelling results

3.1 WS network modelling

The internal WS network within the MLV development was not assessed as part of this study, as such, the modelled pressure and headloss was assessed at the development's connection point to the WS network. The results have been analysed, to verify whether the required LOS and FF classification can be maintained.

3.1.1 Minimum pipe size required along Dunstan Road

Currently, the network extends as far as 147 Dunstan Road, which is approximately 1.2 km south from the proposed MLV development site. Therefore, a new watermain pipe is required along Dunstan Road (delimited in Figure 1-1), to enable the integration of the development into the Alexandra WS network.

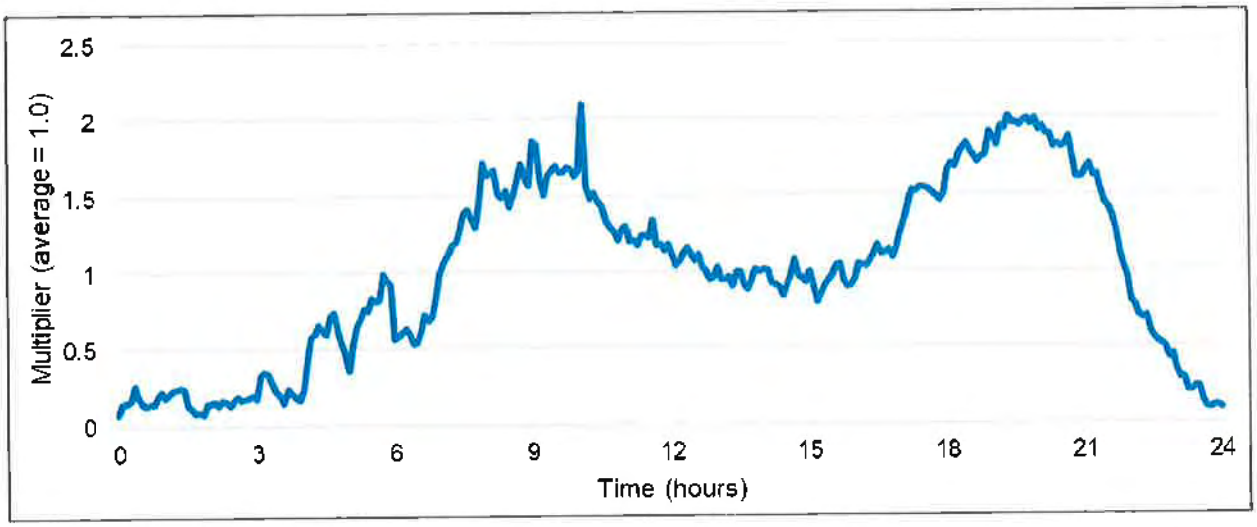
The minimum pipe size required along Dunstan Road, to adequately service the proposed development and provide the required FF classification (25 l/s – FW2), has also been determined using EPAnet (version 2.2). In order to comply with the LOS (stated in Section 2.2), the residual pressure at the node (considered a hydrant in this exercise) cannot drop below 10 metres. A reiterative approach was undertaken in order to determine the minimum pipe size required and the final two iterations (resulting in 10 metres or higher) are shown in Table 3.1, alongside the pipe material, nominal and internal diameters.

3.1.2 Table 3.1: Minimum pipe size required along Dunstan Road

Pipe material	Nominal Diameter (mm)	Internal Diameter (mm)	Minimum pressure when simulating FW2 at 'MolyLV_Node_2' (m)
HDPE (PE100)	280	237.9	11.8
PN 12.5	315	267.6	33.9

Importantly, the reiterative process took into consideration the demand associated with the proposed MLV development, The FF flow was simulated during the diurnal time where the average usage is equal to 60% of the peak demand observed within the Alexandra residential pattern (see Figure 3-1).

Figure 3-1: Residential diurnal profile in Alexandra WS network



Modelling indicated the pipe size DN 280 mm would enable the LOS and FF flow required; however, the modelled residual pressure was only 1.8 metres above the recommended LOS. Network variability and margin of error must be taken into consideration, therefore, the next pipe size available (DN 315 mm) was recommended and is used in the system performance analysis.

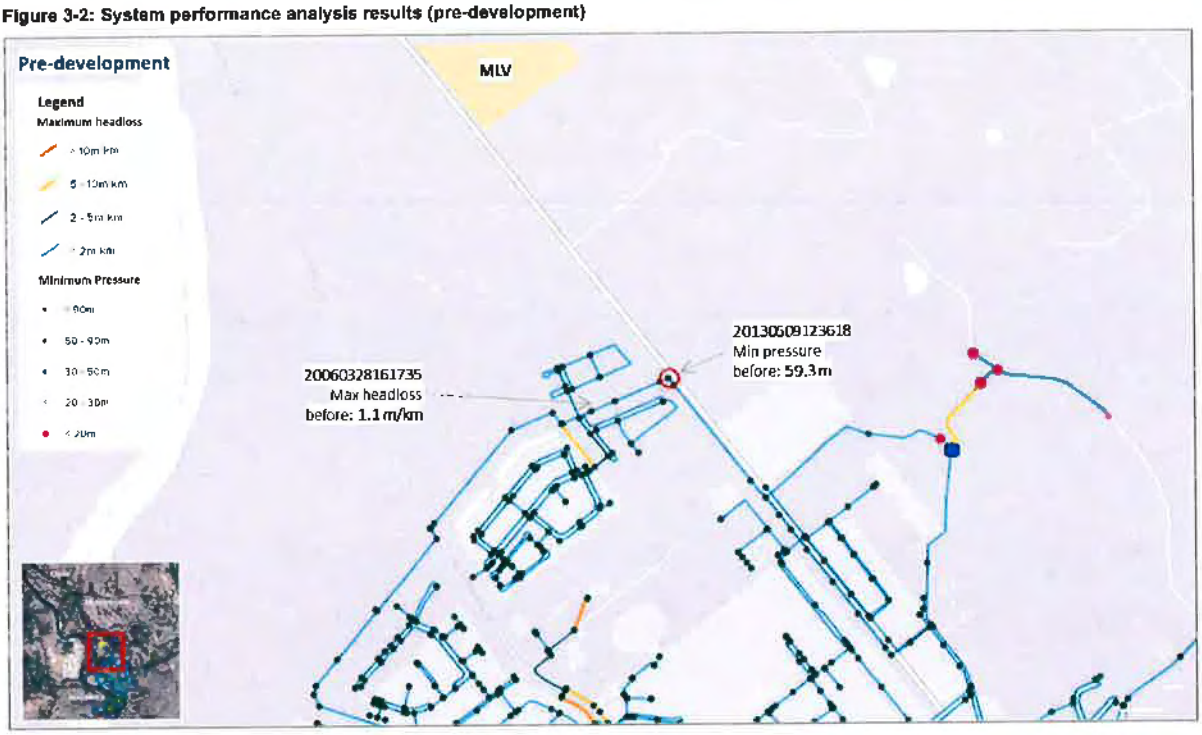
Notably, if a care facility is to be integrated within the MLV development, FW3 (50 l/s) would be required. Thusly, the minimum pipe size that would be required along Dunstan Road would be DN 355 mm (ID 301.6 mm), if constructed as HDPE pipe (PE100 & PN12.5). This sizing was not considered during the SPA, as the CODC specified the FF capability required is FW2. Therefore, it is assumed there will be no care facility.

3.1.3 WS system performance analysis results

The section describes the results of the SPA undertaken for the calibration scenario, before and after the proposed MLV development (including the associated demand) was added to the WS network model. Results have been analysed to verify whether the LOS can be met at the point of connection and at the highest elevation within the development (excluding the internal WS network – remains unknown). The LOS have been assessed assuming the pipe size recommended in Section 3.1.1 (or similar) will be constructed.

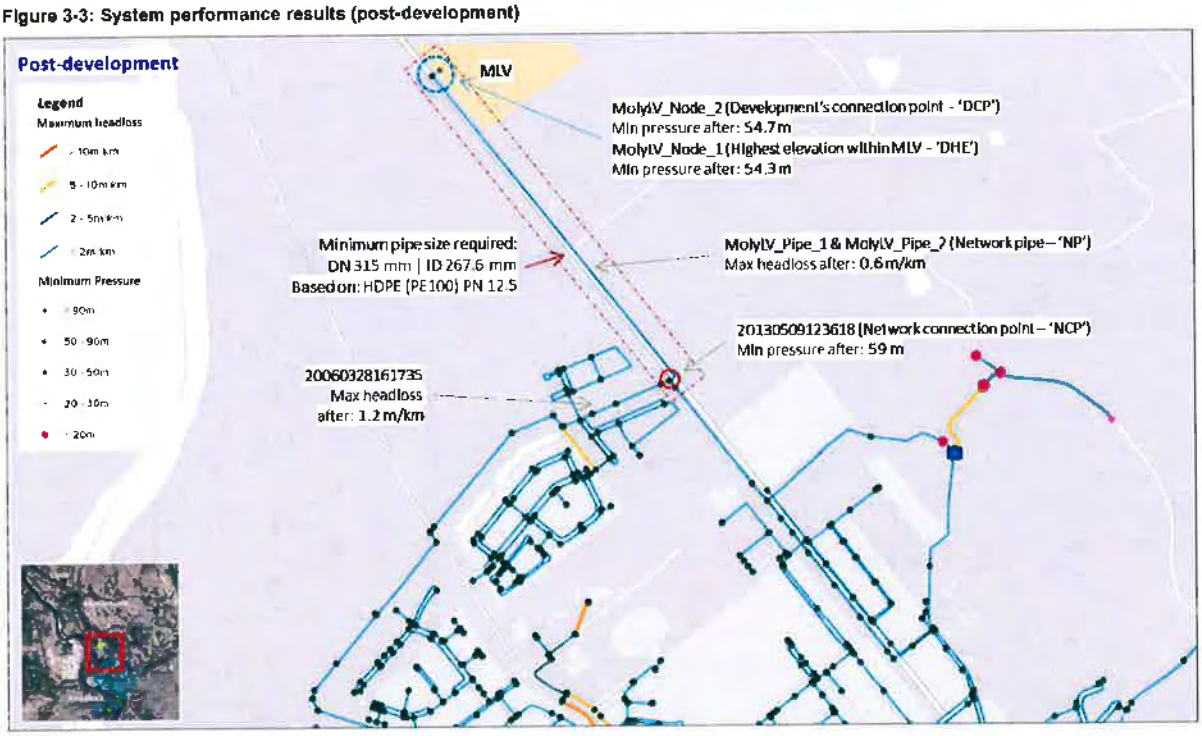
Figure 2-1 and Figure 3-1 illustrate the SPA results before and after the development was added to the WS network, the same information is tabulated in Table 3.2 and Table 3.3.

Figure 3-2: System performance analysis results (pre-development)



Source: Mott MacDonald, 2020

Figure 3-3: System performance results (post-development)



Source: Mott MacDonald, 2020

Table 3.2: Minimum pressure comparison (pre and post development)

Nodes	Minimum pressure at selected nodes (m)		Variance (+/-)
	Pre-development	Post-development	
20130509123618	59.3	59.0	-0.3
MolyLV_Node_1	-	54.3	n/a
MolyLV_Node_2	-	54.7	n/a

Table 3.3: Maximum head losses comparison (pre and post development)

Pipes	Maximum head losses at proximal pipes (m/km)		Variance (+/-)
	Pre-development	Post-development	
20060328161735	1.1	1.2	+0.1
MolyLV_Pipe_1 (NP)	-	0.6	n/a
MolyLV_Pipe_2 (NP)	-	0.6	n/a

Within the area surrounding the connection point, there is a negligible drop in pressure (-0.3 m) and a minor increase in head losses (+0.1 m/km). The maximum head loss is predicted to be 0.6 m/km in the proposed DN 315 mm). At the development connection point and highest elevation location, the pressures are predicted to be 54.7 m and 54.3 m, respectively.

Regarding the LOS stated in Section 2.2, both the operating pressure and maximum permitted head losses comply with the required LOS.

3.1.4 FF capability and hydrant locations

As instructed by the CODC, the required FF capacity for the proposed development is 25 l/s, which is equivalent to FW2 (no sprinkler system).

Assuming a proposed DN 315 mm watermain servicing the development, the predicted pressure drop is 21 m and the residual pressure is predicted at 33.9 m (above the lowest recommended LOS at 10 m). Additionally, the pressure does not drop below null within the remainder of the Alexandra WS network.

Furthermore, the proximity of each proposed lot in relation to the selected (DCP) has been assessed and visualised in Figure 3-4. Evidently, multiple hydrants will need to be integrated within the development's internal WS network, in order to comply with the LOS and FF water standards stated in Section 2.2. This should be taken into consideration by the developer and the CODC during the detailed design stages.

Figure 3-4: DCP proximity from the MLV development

Regarding the LOS stated in Section 2.2, both the predicted FF flow and capability is compliant with the required LOS and FF water standards at the development connection point. However, this should be reassessed once the internal WS network is finalised and the location of hydrants is known.

3.2 WW network modelling

3.2.1 WW system performance analysis criteria

An assessment of the model results was carried out for the Base Model and Post-Development Models to investigate the existing Alexandra wastewater network performance considering:

- Pipe capacity
- Overflow volume

Pipe capacities were evaluated in two ways. Firstly, by comparing the modelled peak flow with the theoretical pipe full capacity (Q_{max}/Q_f) and secondly, by comparing the modelled peak depth with the pipe diameter (H_{max}/Diameter).

Peak flows above the theoretical pipe capacity indicate that the pipe is undersized and cannot convey the peak flows that are required through the network. Pipes where the capacity is exceeded show that $Q_{max}/Q_f > 1$. In cases where pipes have capacity but are surcharged (due to downstream constraints), the model results will show that $Q_{max}/Q_f < 1$ and H_{max}/Diameter > 1.

The system performance was carried out for the model scenario for both the Dry Weather Flow (DWF) and the 10-year Average Recurrence Interval (ARI) Wet Weather Flow (WWF) events. The results of the wastewater system performance analysis are summarised in the sections below.

3.2.2 Dry Weather Flow system performance

The pipe capacity results for the DWF scenarios are summarised in Table 3.4 below. Table 3.4 indicates that

- for Option 1, the additional wastewater flows from the MLV development are not predicted to increase the number of pipes that are under capacity in the existing network during the DWF event.
- for the Option 2, the number of pipes that are under capacity in the existing network are predicted to increase by one for the DWF event, when compared to the pre-development scenario.

The model results indicate that the increase in wastewater discharge from the development is predicted to cause existing pipe 20031203001638 to be under capacity, during the DWF event, when the proposed rising main is connected to the existing wastewater network at 99 Russel Street (Option 2). This 150 mm diameter pipe is located downstream of the proposed Option 2 connection point, as shown on Figure 3-5 below.

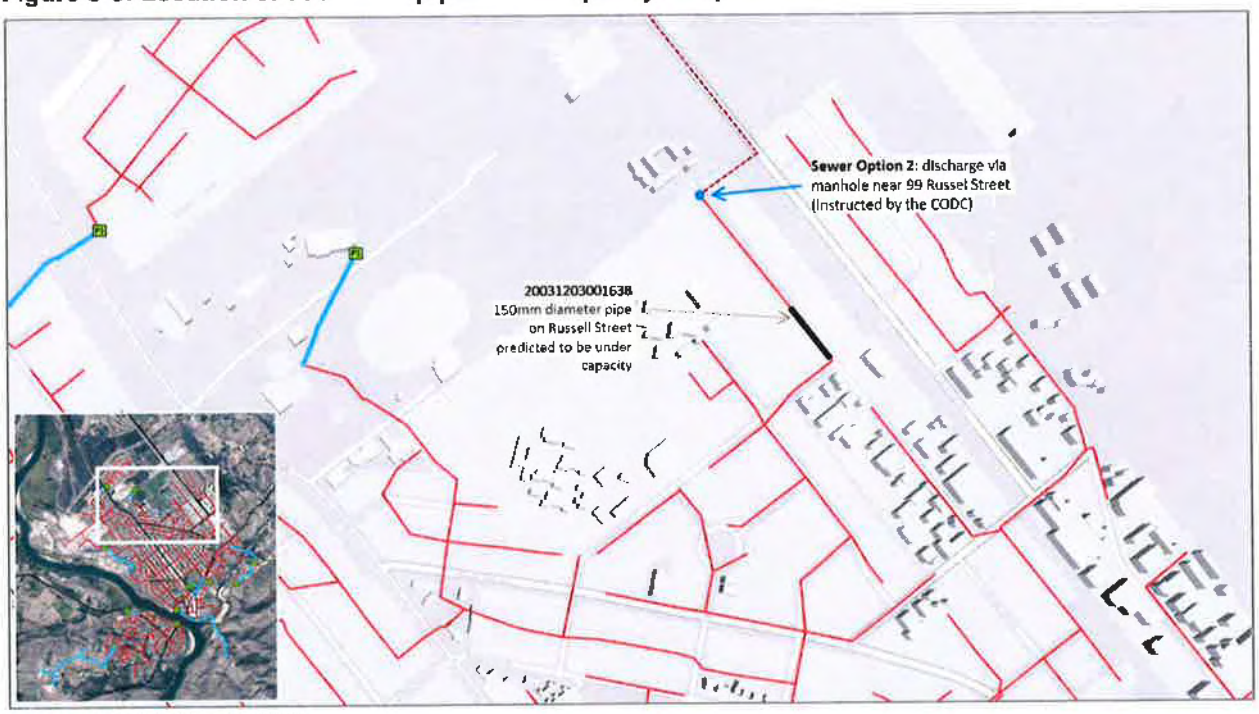
The results do not predict overflows to occur during the DWF event for the base model and the Options 1 and 2 models.

Table 3.4: DWF System Performance – Pipe Capacity Summary

Scenario	Number of Pipes with Capacity Exceeded	Total Length of Pipe with Capacity Exceeded (m)	% of Total	Number of Pipes Surcharged due to Downstream Conditions*	Total Length of Pipe Surcharged due to Downstream Conditions (m)	% of Total
Base Model	8	468	0.9%	60	2,017	7%
Post-Development Option 1 Model	8	653	1%	60	2,017	7%
Post-Development Option 2 Model	9	743	1%	60	2,017	7%

Source: Mott MacDonald
*Number of pipes which have capacity but are surcharged (due to downstream conditions)

Figure 3-5: Location of additional pipe under capacity in Option 2 DWF scenario



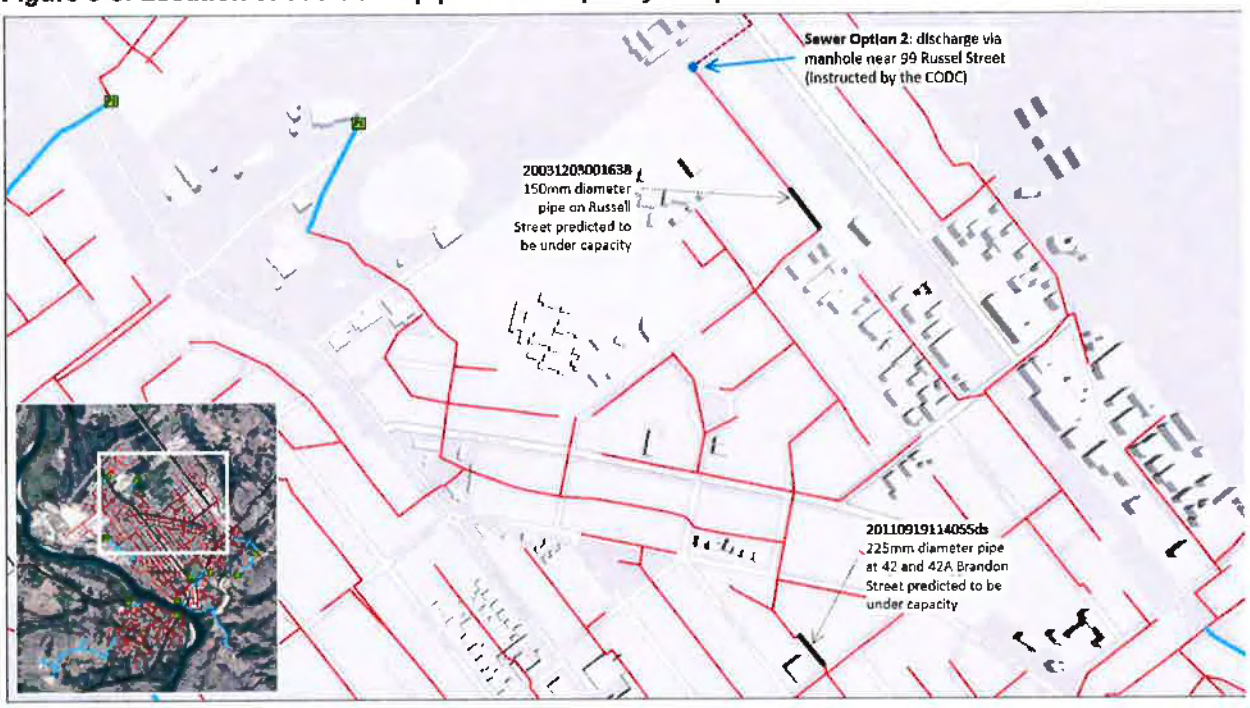
Source: Mott MacDonald, 2020

3.2.3 Wet Weather Flow system performance

The pipe capacity and overflow results for the WWF scenarios are summarised in Table 3.5 and Table 3.6 below. For the WWF event, the additional wastewater flows from the MLV development are not predicted to increase the number of pipes under capacity when the proposed rising main is connected to the existing network outside of 36 Henderson Drive (Option 1).

The model results indicate that the additional flows from the MLV development for the Option 2 WWF scenario are predicted to increase the number of pipes under capacity by two, when compared to the pre-development scenario. The location of these additional pipes that are predicted to be under capacity are shown on Figure 3-6 below. For the WWF event, the model does not predict that the additional flows from MLV development (Option 1 and 2 scenarios) will cause additional overflows to occur.

Figure 3-6: Location of additional pipe under capacity in Option 2 WWF scenario



Source: Mott MacDonald, 2020

Table 3.5: WWF System Performance – Pipe Capacity Summary

Scenario	Number of Pipes with Capacity Exceeded	Total Length of Pipe with Capacity Exceeded (m)	% of Total	Number of Pipes Surcharged due to Downstream Conditions*	Total Length of Pipe Surcharged due to Downstream Conditions (m)	% of Total
Base Model	19	955	2%	129	6,360	15%
Post-Development Option 1 Model	19	955	2%	129	6,276	15%
Post-Development Option 2 Model	21	1,108	2%	130	6,403	15%

Source: Mott MacDonald
*Number of pipes which have capacity but are surcharged (due to downstream conditions)

Table 3.6: WWF System Performance – Overflow Summary

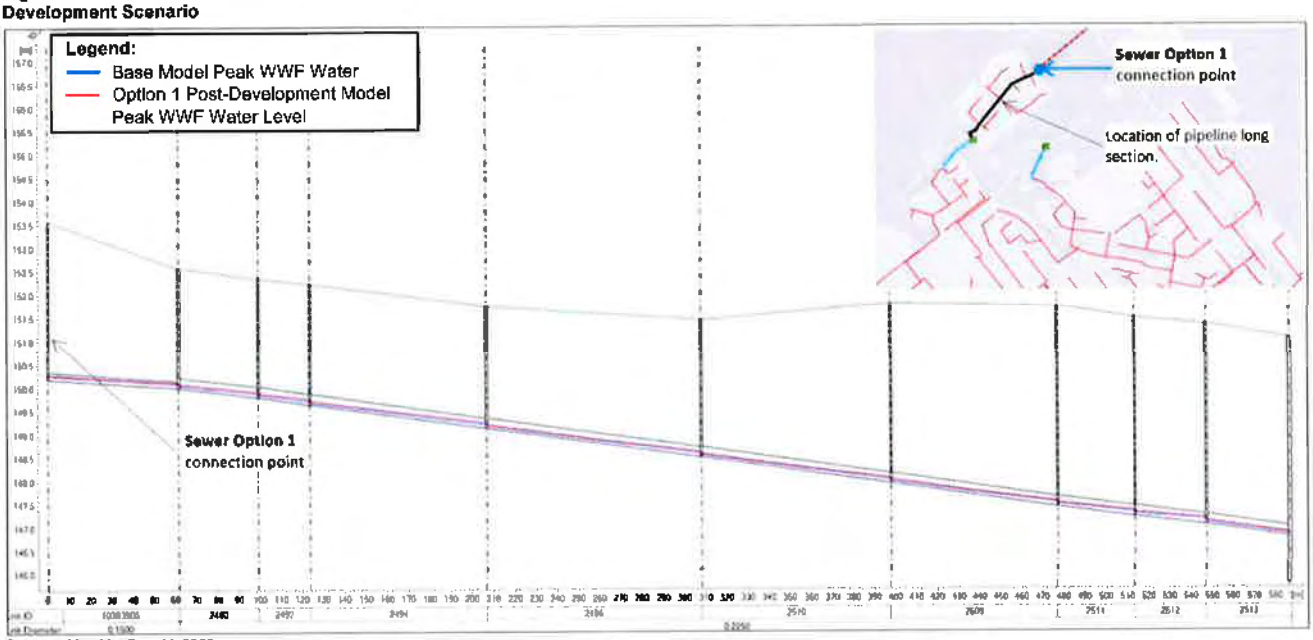
Scenario	Total Number of Overflows	Total Overflow Volume (m^3)*
Base Model	2	23.0
Post-Development Option 1 Model	2	22.9
Post-Development Option 2 Model	2	22.9

Source: Mott MacDonald
*Minor differences in overflow volumes for the model scenarios are negligible and within the modelling tolerance.

The WWF peak water level long section results for the pipeline located downstream of the proposed Option 1 rising main connection point (pipeline 20060329140821 to Molyneux East Pump Station) is shown on Figure 3-7 below. The long section results indicate the proposed development flows are predicted to slightly increase the water levels in this downstream existing pipeline during the WWF event. However, for the post-development scenario, the additional flows from the development are not predicted to cause pipeline to surcharge during the WWF event.

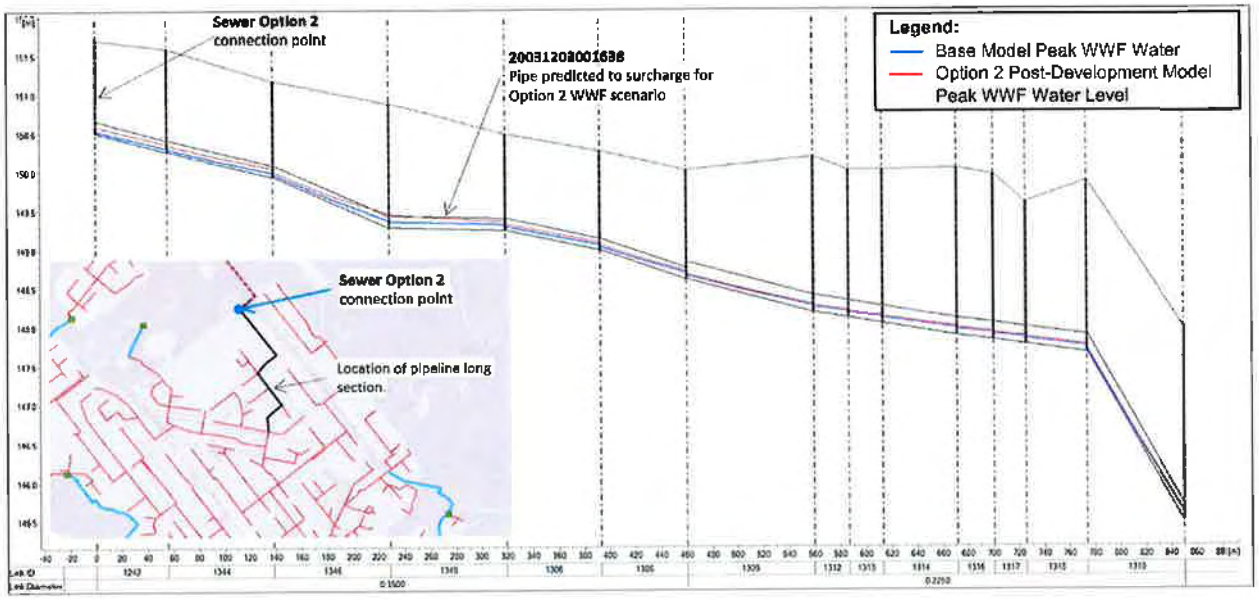
Figure 3-8 below illustrates the WWF peak water level long section results for the pipeline located downstream of the proposed Option 2 rising main connection point (pipeline 20031201222707 to 20031202230318). The results indicate the proposed flows from the MLV development are predicted to increase the water levels in the downstream pipeline 20031201222707 to 20031202230318. The results also predict that the proposed development will cause the upstream end of pipe 20031203001638 to surcharge during the WWF event.

Figure 3-7: WWF Peak Water Level Long Section Result for Pipeline 20060329140821 to Molyneux East Pump Station - Base Model and Option 1 Post Development Scenario



Source: Mott MacDonald, 2020

Figure 3-8: WWF Peak Water Level Long Section Result for Pipeline 20031201222707 to 20031202230318 - Base Model and Option 2 Post Development Scenario

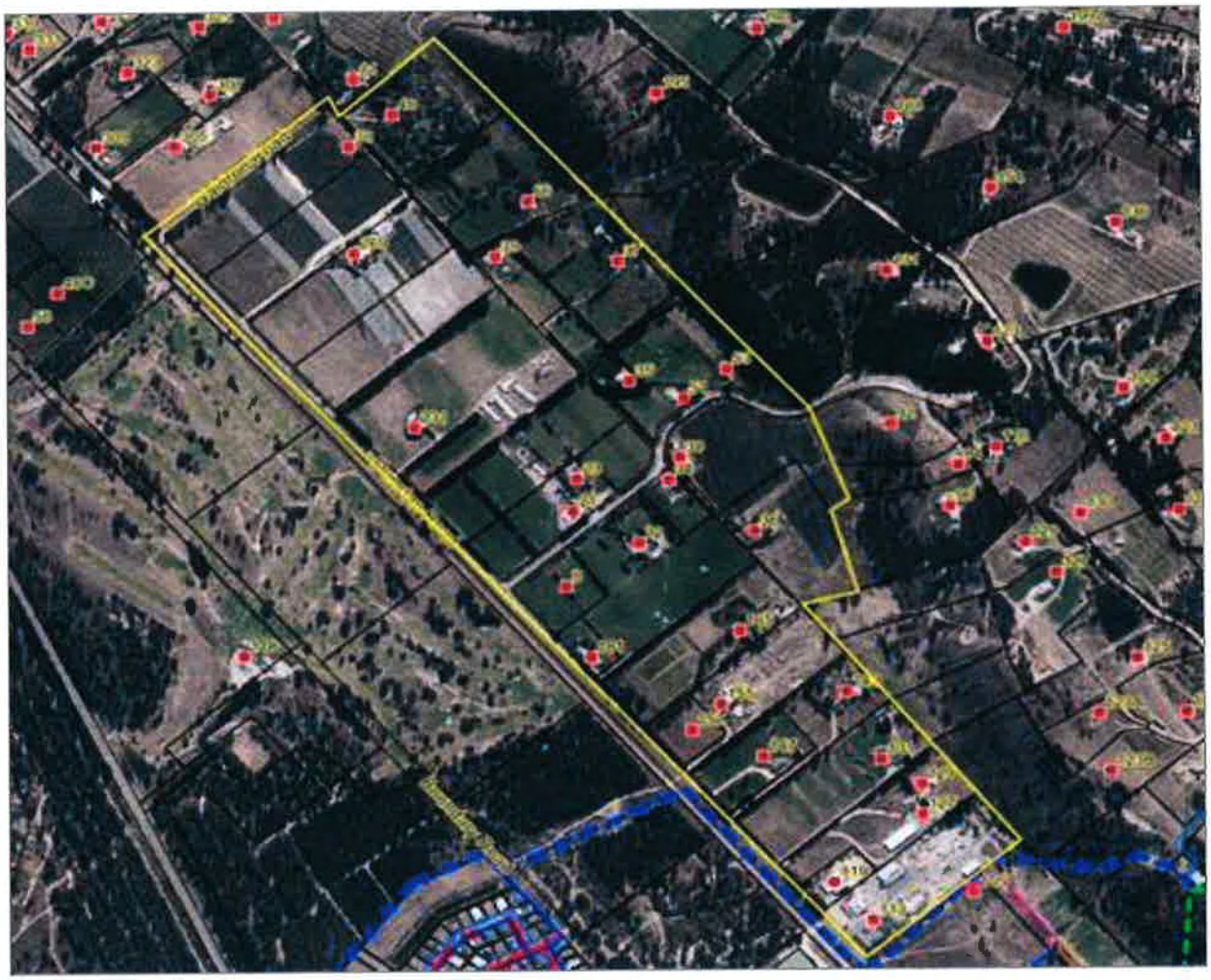


Source: Mott MacDonald, 2020

4 Impact on the network from a plan change

The impact on the WS and WW networks from a plan change between the proposed development and Alexandra town was also assessed. Figure 4-1 below shows the extent of the potential future development considered. As agreed with CODC, the total number of lots assumed in this area was 300, which also includes the 60 lots considered in the above sections of this study.

Figure 4-1: Potential future development extent



4.1 Water Supply

The additional 300 lots (total) have a negligible impact on the pipe network, with a head loss difference of 0.1m/km compared to the pre-development scenario. Minimum pressure at the connection point is predicted to drop from 59.3 m to 57.7 m. This is due to the Northern Reservoir draining to 0.5m during the evening peak demand period (instead of 1.8 m in the pre-development scenario). This is likely related to the model operational set up (bores pumping times may vary depending on the level in the Northern Reservoir). However, it should be noted that the peak day demand corresponds to 450 m^3/day, which corresponds to 23% of the existing Norther Reservoir.

4.2 Wastewater

The impact of the proposed plan change area was assessed using the two options that were proposed for the MLV development (a new pump station and rising main to connect to the downstream existing network at either 36 Henderson Drive or 99 Russel Street). For this assessment, the pump station was assumed to have a fixed pump rate of 15 l/s and have no storage in the wet well.

The wastewater flows from the proposed plan change area were calculated based on an assumed total number of lots of 300 and the assumptions listed in Section 2.1 of this technical memo. The model results for the post-development plan change scenarios are summarised in Table 4.1, Table 4.2 and Table 4.3 below.

The results indicate that for the Option 1, the additional flows from the plan change area are not predicted to increase the number of pipes under capacity for the DWF event. For Option 2, the results predict that the additional flows from the proposed plan change area will cause an additional two pipes to be under capacity when compared to the MLV Development Option 2 model for the DWF event. These additional pipes are located on Russel Street (downstream of the proposed Option 2 connection point to the existing network).

The results do not predict overflows to occur during the DWF event for the base model, the MLV Development Options 1 and 2 models and the Plan Change Options 1 and 2 models.

Table 4.1: Plan Change Impact Assessment - DWF Pipe Capacity Summary

Scenario	Total Number of Proposed Lots	Number of Pipes with Capacity Exceeded	% of Total	Number of Pipes Surcharged due to Downstream Conditions*	% of Total
Base Model	N/A	8	0.9%	60	7%
Post-Development Option 1 Model	60 (MLV Development Only)	8	1%	60	7%
	300 (Plan Change)	8	1%	62	7%
Post-Development Option 2 Model	60 (MLV Development Only)	9	1%	60	7%
	300 (Plan Change)	11	1%	67	8%

Source: Mott MacDonald
*Number of pipes which have capacity but are surcharged (due to downstream conditions)

For the WWF event, the model results indicate that the additional flows from the plan change area are predicted to increase the number of pipes under capacity by one, when compared to the MLV Option 1 model. This additional pipe (asset ID 20031215141651) is a 300mm diameter trunk main which is located downstream of the site at 1 Dunorling Street. The Option 1 results predict that the additional flows from the plan change area will not increase the number of overflows during the WWF event.

The Option 2 plan change WWF results indicate that the additional flows from the site are predicted to increase the number of pipes under capacity by eight, when compared to the MLV Option 2 WWF model. The Option 2 results also predict that the additional flows from the plan change area will cause one additional overflow to occur during the WWF event. The model predicts a WWF overflow volume of 2.1m^3 from this additional overflow location. The pipe capacity issues and overflows that are predicted to occur due to the additional wastewater flows from the plan change area are located downstream of the proposed Option 2 connection point, as shown on Figure 4.2 below.

Table 4.2: Plan Change Impact Assessment - WWF Pipe Capacity Summary

Scenario	Total Number of Proposed Lots	Number of Pipes with Capacity Exceeded	% of Total	Number of Pipes Surcharged due to Downstream Conditions*	% of Total
Base Model	N/A	19	2%	129	15%

Scenario	Total Number of Proposed Lots	Number of Pipes with Capacity Exceeded	% of Total	Number of Pipes Surcharged due to Downstream Conditions*	% of Total
Post-Development Option 1 Model	60 (MLV Development Only)	19	2%	129	15%
	300 (Plan Change)	20	2%	180	21%
Post-Development Option 2 Model	60 (MLV Development Only)	21	2%	130	15%
	300 (Plan Change)	29	3%	140	16%

Source: Mott MacDonald
*Number of pipes which have capacity but are surcharged (due to downstream conditions)

Table 4.3: Plan Change Impact Assessment - WWF Overflow Summary

Scenario	Total Number of Proposed Lots	Total Number of Overflows	Total Overflow Volume (m^3)
Base Model	N/A	2	23.0*
Post-Development Option 1 Model	60 (MLV Development Only)	2	22.9*
	300 (Plan Change)	2	23.1*
Post-Development Option 2 Model	60 (MLV Development Only)	2	22.9*
	300 (Plan Change)	3	25.2

Source: Mott MacDonald
*Minor differences in overflow volumes for the model scenarios are negligible and within the modelling tolerance.

Figure 4.2: Location of additional pipes under capacity and overflows in Option 2 Plan Change WWF scenario

Source: Mott MacDonald, 2020

5 Conclusion and recommendations

5.1 Water supply

The demand from the proposed MLV development (60 lots) has been added to the network under the calibration scenario conditions. The proposed MLV development's internal network was not modelled as part of this study; however, the total demand was modelled proximal to the development connection point at the highest elevation, to determine whether suitable LOS and FF water standards could be maintained.

Additionally, the minimum pipe size required along Dustan Road to service the development and provide FW2 fire flow was determined to be DN 315 mm (Section 3.1.1). Further modelling should be considered once the development's WS detailed design is confirmed, to assess the suitability of hydrants location.

The SPA predicted pressure drops and head losses to be negligible within the remainder of the network, therefore, compliant with the LOS stated in Section 2.2. Based on the results from the WS modelling, the following recommendations can be made:

- The minimum pipe size required to service the development along Dunstan Road is DN 315 mm;
- Multiple hydrants are required within the development's internal WS network to be compliant.

5.2 Wastewater

The Alexandra wastewater network model was updated to incorporate the proposed Molyneux Lifestyle Village development. The modelling carried out for this assessment consisted of three scenarios:

- Base model (pre-development scenario).
- Option 1: connection of the proposed MLV rising main to the existing network outside 36 Henderson Dr.
- Option 2: connection of the proposed MLV rising main to the existing network outside of 99 Russel St.

The model results indicate that for the DWF event, Option 1 is not predicted to increase the number of pipes under capacity and Option 2 is predicted to increase the number of pipes under capacity by one. The results do not predict overflows to occur for the base model and the Options 1 and 2 models during the DWF event.

For the WWF events, the proposed development is not predicted to increase the number of pipes under capacity in the existing Alexandra wastewater network for Option 1. The results predict that two additional pipes will be under capacity for Option 2 during the WWF event. The results did not predict that the proposed development for Options 1 and 2 will cause additional overflows to occur from the existing network during the WWF event.

5.3 Plan Change Impact

The impact on the WS and WW networks from a plan change (total of 300 lots) between the proposed development and Alexandra town was also assessed.

- **WS network**:
  - The predicted impact is negligible, however, it should be noted that the 300 lots' demand (peak day) would represent 23% of the existing Northern Reservoir volume.
- **WW network**:
  - Option 1: the number of pipes under capacity is predicted to increase the by one under WWF, when compared to the proposed 60 lots development
  - Option 2: the number of pipes under capacity is predicted to increase the by two under DWF and eight under WWF. One additional overflow is predicted to occur (2.1m^3).

APPENDIX D

Confirmation of Telecom Supply

Chorus Property Development Team
PO Box 9405
Waikato Mail Centre
Hamilton 3200
Telephone: 0800 782 386
Email: develop@chorus.co.nz

23 December 2020

Chorus Ref #: AL61926
Your Ref #:

Molyneux Lifestyle Village Ltd

Attention: **Peter Dymock**
Dear Sir / Madam

Property Development – AL: 269 Dunstan Road, Alexandra - 62 Lots - Simple Estimate

Thank you for your enquiry regarding the above subdivision.

Chorus is pleased to advise that, as at the date of this letter, we would be able to provide ABF telephone reticulation for this property development. In order to complete this reticulation, we require a contribution from you to Chorus' total costs of reticulating the development. Chorus' costs include the cost of network design, supply of telecommunications specific materials and supervising installation. At the date of this letter, our estimate of the contribution we would require from you is $265,718.70 (including GST).

We note that (i) the contribution required from you towards reticulation of the development, and (ii) our ability to connect the subdivision to the Chorus network, may (in each case) change over time depending on the availability of Chorus network in the relevant area and other matters.

If you decide that you wish to undertake reticulation of this property development, you will need to contact Chorus (see the contact details for Chorus Property Development Team above). We would recommend that you contact us at least 3 months prior to the commencement of construction at the subdivision. At that stage, we will provide you with the following:

- confirmation of the amount of the contribution required from you, which may change from the estimate as set out above;

- a copy of the Contract for the Supply and Installation of Telecommunications Infrastructure, which will govern our relationship with you in relation to reticulation of this property development; and

- a number of other documents which have important information regarding reticulation of the property development, including - for example - Chorus' standard subdivision lay specification.

Yours faithfully

C Maher.

Catherine Maher
Network Services Coordinator

APPENDIX E

Confirmation of Power Supply

AURORA ENERGY LIMITED
PO Box 5140, Dunedin 9058
PH 0800 22 00 05
WEB www.auroraenergy.co.nz

Aurora ENERGY

18 December 2020

Peter Dymock
Paterson Pitts Group

Sent via email only: peter.dymock@ppgroup.co.nz

Dear Peter,

ELECTRICITY SUPPLY AVAILABILITY FOR A PROPOSED SIXTY-THREE LOT SUBDIVISION.
269 DUNSTAN ROAD, ALEXANDRA. PT'S LOT'S 12 & 13 DP 3194.

Thank you for your inquiry outlining the above proposed development.

Subject to technical, legal and commercial requirements, Aurora Energy can make a Point of Supply[1] (PoS) available for this development.

Disclaimer

This letter confirms that a PoS **can** be made available. This letter **does not** imply that a PoS is available now, or that Aurora Energy will make a PoS available at its cost.

Next Steps

To arrange an electricity connection to the Aurora Energy network, a connection application will be required. General and technical requirements for electricity connections are contained in Aurora Energy's Network Connection Standard. Connection application forms and the Network Connection Standard are available from www.auroraenergy.co.nz.

Yours sincerely

NA Frear

Niel Frear
CUSTOMER INITIATED WORKS MANAGER

[1] Point of Supply is defined in section 2(3) of the Electricity Act 1993.

APPENDIX F

CBR TESTS

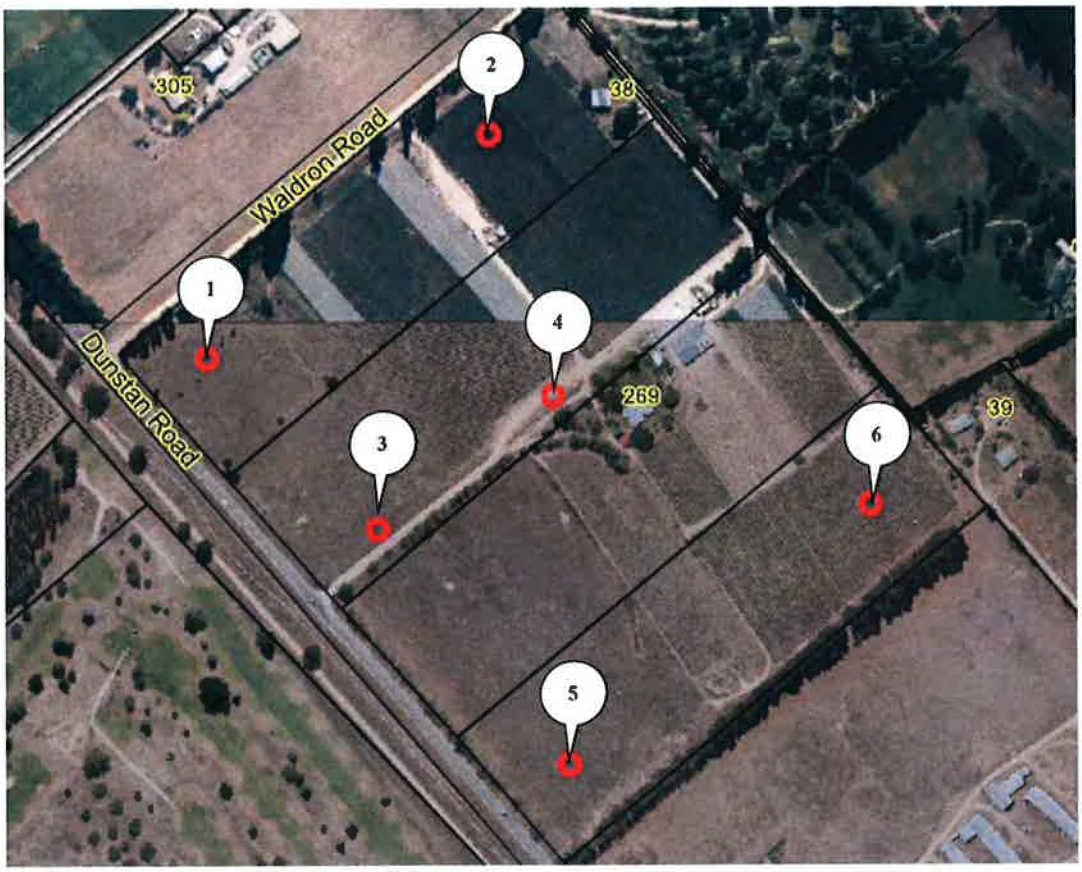
Central Testing Services
18 Ngapara St, P.O. Box 397, Alexandra 9340, Central Otago, New Zealand
P: 03 4487644, W: www.centraltesting.co.nz, E: info@centraltesting.co.nz

Reference No: 21/327

Date: 12 February 2021

TEST REPORT - LABORATORY SOAKED CBR'S

Client Details:	**Molyneux Lifestyle Village Ltd, c/-Russell Ibbotson, P.O. Box 120, Alexandra**	**Attention:**	**c/o M. Garmonsway**
Job Description:	**William Hill Investigations**		
Sample Description:	**Subgrade**	**Client Order No:**	**N/A**
Sample Source:	**Insitu – See Below**	**Sample Label No:**	**01281**
Date & Time Sampled:	**4-Feb-21 @ 1.38 to 2.11pm**	**Sampled By:**	**N.P. Danischewski**
Sample Method:	**NZS 4407:2015, Test 2.4.2**	**Date Received:**	**4-Feb-21**
Test Method:	**NZS 4407:2015, Test 3.15**		



Notes:

- *This report may not be reproduced except in full.*

Tested By: C. Fisher **Date:** 5 to 10-Feb-21

Checked By:

Approved Signatory

A.P. Julius
Laboratory Manager

ACCREDITED IANZ TESTING LABORATORY №434

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

Central Testing Services
18 Ngapara St, P.O. Box 397, Alexandra 9340, Central Otago, New Zealand
P: 03 4487644, W: www.centraltesting.co.nz, E: Info@centraltesting.co.nz

Reference No: 21/327

Date: 12 February 2021

TEST REPORT - LABORATORY SOAKED CBR'S

Client Details:	Molyneux Lifestyle Village Ltd, c/-Russell Ibbotson, P.O. Box 120, Alexandra	**Attention:**	c/o M. Garmonsway
Job Description:	William Hill Investigations		
Sample Description:	Subgrade – See Below	**Client Order No:**	N/A
Sample Source:	Insitu – See Page 3	**Sample Label No:**	01281
Date & Time Sampled:	4-Feb-21 @ 1.38 to 2.11pm	**Sampled By:**	N.P. Danischewski
Sample Method:	NZS 4407:2015, Test 2.4.2	**Date Received:**	4-Feb-21
Test Method:	NZS 4407:2015, Test 3.15		

LABORATORY SOAKED CBR RESULTS			
Sample Source:	#4	#5	#6
Sample Depth BGL: (mm)	300 - 600	300 - 600	300 - 600
Sample Description:	SAND with minor / some silt	Sandy GRAVEL with trace of silt	Silty SAND with trace of gravel
Condition of Sample:	Soaked	Soaked	Soaked
Surcharge Mass: (kg)	4.0	4.0	4.0
Time Soaked:	4 days	4 days	4 days
Swell: (%)	0.0	0.0	0.2
Water Content as Compacted: (%)	3.5	4.1	2.8
Water Content From Under Plunger: (%)	19.2	9.7	11.8
Dry Density As Compacted: (t/m^3)	1.61	1.95	1.89
CBR Value @ 2.5 mm Penetration:	7	16	5
CBR Value @ 5.0 mm Penetration:	8	18	6
Reported CBR Value:	8	18	6
Contract Specification Requirement	Minimum 7		

Notes:

- *The material was received in a natural state.*
- *The material tested was the fraction passing the 19.0mm test sieve.*
- *The sample was compacted to NZ Standard Compaction at the water content as received.*
- *The rate of penetration was 1.00 mm / min.*
- *Information contained in this report which is Not IANZ Accredited relates to the sample descriptions based on NZ Geotechnical Society Guidelines 2005.*
- *This report may not be reproduced except in full.*

Tested By: C. Fisher **Date:** 5 to 10-Feb-21

Checked By:

ACCREDITED IANZ TESTING LABORATORY № 434

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

Central Testing Services
18 Ngapara St, P.O. Box 397, Alexandra 9340, Central Otago, New Zealand
P: 03 4487644, W: www.centraltesting.co.nz, E: info@centraltesting.co.nz

Reference No: 21/327

Date: 12 February 2021

TEST REPORT - LABORATORY SOAKED CBR'S

Client Details:	Molyneux Lifestyle Village Ltd, c/-Russell Ibbotson, P.O. Box 120, Alexandra	Attention:	c/o M. Garmonsway
Job Description:	William Hill Investigations		
Sample Description:	Subgrade – See Below	Client Order No:	N/A
Sample Source:	Insitu – See Page 3	Sample Label No:	01281
Date & Time Sampled:	4-Feb-21 @ 1.38 to 2.11pm	Sampled By:	N.P. Danischewski
Sample Method:	NZS 4407:2015, Test 2.4.2	Date Received:	4-Feb-21
Test Method:	NZS 4407:2015, Test 3.15		

LABORATORY SOAKED CBR RESULTS			
Sample Source:	#1	#2	#3
Sample Depth BGL: (mm)	300 - 600	300 - 600	300 - 600
Sample Description:	Gravelly SAND with a trace of silt	SAND with some silt and trace of gravel	SAND with minor gravel and trace of silt
Condition of Sample:	Soaked	Soaked	Soaked
Surcharge Mass: (kg)	4.0	4.0	4.0
Time Soaked:	4 days	4 days	4 days
Swell: (%)	0.0	0.0	0.0
Water Content as Compacted: (%)	3.9	2.0	3.4
Water Content From Under Plunger: (%)	12.2	18.6	18.1
Dry Density As Compacted: (t/m^3)	1.85	1.62	1.66
CBR Value @ 2.5 mm Penetration:	15	4.5	8
CBR Value @ 5.0 mm Penetration:	15	6	9
Reported CBR Value:	15	6	9
Contract Specification Requirement	Minimum 7		

Notes:

- *The material was received in a natural state.*
- *The material tested was the fraction passing the 19.0mm test sieve.*
- *The sample was compacted to NZ Standard Compaction at the water content as received.*
- *The rate of penetration was 1.00 mm / min.*
- *Information contained in this report which is Not IANZ Accredited relates to the sample descriptions based on NZ Geotechnical Society Guidelines 2005.*
- *This report may not be reproduced except in full.*

Tested By: C. Fisher **Date:** 5 to 10-Feb-21

Checked By:

ACCREDITED IANZ TESTING LABORATORY №434

Test results indicated as not accredited are outside the scope of the laboratory's accreditation

APPENDIX G

RM 2001.148

COUNTERPART

Otago Regional Council

Our Reference: A416450

Consent No: 2001.148

WATER PERMIT

Pursuant to Section 105 of the Resource Management Act 1991, the Otago Regional Council grants consent to:

Name: ~~[William Hill Grant]~~ [$^{287}/_{367}$ ~~share~~] Transferred 10 September 2013
Address: [redacted]

Name: ~~[Divine International Limited]~~ [$^{287}/_{367}$ ~~share~~] Transferred 27 April 2017
Address: [redacted]

Name: ~~[William Hill Holdings Limited]~~ [$^{80}/_{367}$ ~~share~~] Transferred 21 January 2014
Address: ~~Offices of Findlay & Co, 9 Cliff Wilson Street, Wanaka~~

Name: ~~[Dunstan Road Water Company Limited $^{80}/_{367}$ share]~~ Transferred 9 June 2017
Address: ~~[Southland Building Society, 51 Don Street, Invercargill]~~

Name: Molyneux Lifestyle Village Limited $^{80}/_{367}$ share
Address: Russell Ibbotson, Chartered Accountant & Business Consultant, 50 Tarbert Street, Alexandra, Alexandra

Name: ~~[Gillian Blanche Grant $^{287}/_{367}$ share]~~ *Transferred 20 Febuary 2019*
Address: [redacted]

Name: *David James Grant $^{287}/_{367}$ share*
Address: [redacted]

to take up to 367 cubic metres per day of groundwater at a rate of up to 4.25 litres per second

for the purpose of irrigation, communal water supply, winery and sale.

For a term expiring 30 June 2036

Location of activity: Alexandra, approximately 260 metres south east of the intersection of Dunstan Road and Waldron Road

Legal description of land adjacent to point of taking: Pt Lot 13 DP 3194

Map reference: NZMS 260: G42: 255-472

Conditions:

1. That the rate of taking water shall not exceed 367 cubic metres per day or 4.25 litres per second.

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Otago Regional Council

2. The bore head casing and reticulation shall be suitably constructed and sealed to avoid ingress of floodwater and other foreign matter.

Issued at Dunedin this 27th day of June 2001
Reissued at Dunedin this 28th day of February 2012 to reflect the transfer of $^{80}/_{367th}$ share from William Hill Grant to William Hill Holdings Limited, to update the Legal description of land adjacent to point of taking and to updated the location of activity.
Reissued this 24th day of September 2013 to reflect the transfer of $^{287}/_{367}$ share from William Hill Grant to Divine International Limited
Reissued at Dunedin this 24th day of January 2014 to reflect the transfer $^{80}/_{367}$ share of holder from William Hill Holdings Limited to Dunstan Road Water Company Limited
Reissued at Dunedin this 11th day of May 2017 to reflect the transfer $^{287}/_{367}$ share from Divine International Limited to Gillian Blanche Grant
Reissued at Dunedin this 14th day of June 2017 to reflect the transfer of holder from Dunstan Road Water Company Limited to Molyneux Lifestyle Village Limited
Reissued at Dunedin this 20th day of February 2019 to reflect the transfer of $^{287}/_{367}$ share from Gillian Blanche Grant to David James Grant.

Kylie M. Galbraith
Acting Manager Consents

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