

Residential Red Zone



Interim Treatment Area Categories Revision C
Prepared for Canterbury Earthquake Recovery Authority

5 June 2013



Boffa Miskell

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CONTENTS

1.0	Introduction	1
2.0	Report Area Location	3
	Site Location	3
3.0	Assumptions and Limitations	4
4.0	Methodology	5
	Methodology Summary	5
	Visibility/Profile	5
	Surrounding Landscape, Ecology and Physical Context	7
	Other Site Features	7
5.0	Analysis and Treatment Areas	8
	Alterations to Original Mapped Treatment Areas	8
	Treatment Areas to Remain Unchanged	8
	Grassland Treatment Area Categories	9
6.0	Recommendations	15
7.0	Confirmations	15
8.0	References	17

Appendices

Appendix 1: CERA RESIDENTIAL RED ZONE Block Clearances – Treatment Area Category Buffers
Appendix 2: CERA RESIDENTIAL RED ZONE Block Clearances – Treatment Area Category Plans

Figures

Figure 1: Residential Red Zone Extent	3
Figure 2: Dallington – View across block from Moyna Avenue to Ferner Street.....	6
Figure 3: Beach community context of Pines Beach	11
Figure 4: Rural and Dune Context of Pines Beach.....	12

Figure 5: Site with gravel, foundation and building debris left behind, being colonised by taller weeds.	13
Figure 6: Site at Pines Beach where likely piled house removed and colonised quickly with grass.	14
Figure 7: Trial Clearance Area – New Brighton Road / Goodman Street - Burwood	15
Figure 8: Trial Clearance Area – New Brighton Road / Locksley Avenue – Dallington.....	16
Figure 9: Trial Clearance Area – Gayhurst Road / Locksley Avenue / Rupert Place – Dallington	16

1.0 Introduction

- 1.1 This report and supporting maps have been commissioned by CERA (Canterbury Earthquake Recovery Authority) to provide further analysis of 'Grassland' Treatment Areas as mapped and described in the *Interim Land Clearance Treatment Methodology – Version 1.0*, issued on 27 November 2012 to determine the level of treatment required and to be specified.
- 1.2 It is envisaged that the 'Grassland' treatment areas will be divided into 'level of treatment' categories that are based primarily on visibility/profile (ranging from highly visible to isolated), surrounding landscape, ecology and physical context, as well as other known site features.
- 1.3 The analysis and updated maps included in this report will inform the development and preparation of landscape and ecology template specifications that will be used as tender and contract documents for block clearance work.
- 1.4 A Geographic Information System (GIS) and site visits to the residential red zone have been used to assist in determining the different 'Grassland' categories and related areas. An updated set of maps, based on the original set issued with the Interim Land Clearance Treatment Report, displaying the various categories of 'Grassland' treatment is included with this report.
- 1.5 The other land treatment area options identified in the *Interim Land Clearance Treatment Methodology* have also been reviewed as part of the work carried out for this report to determine if further refinement can be achieved or is required.
- 1.6 Key outcomes for this report are to:
 - Describe the method used to determine categories of 'Grassland' treatment
 - Provide brief descriptions of the categories of 'Grassland' treatment
 - Map the proposed categories of 'Grassland' treatment and any other proposed changes
- 1.7 This report includes:
 - Confirmation of the extent of area to which this report applies
 - Assumptions and limitations
 - Methodology
 - Analysis
 - Treatment Area Categories
 - Recommendations
- 1.8 As previously stated in the *Interim Land Clearance Treatment Methodology*, CERA's objectives for interim land clearance treatment are practicable clearance, retention of amenity and ecological values where practical and the implementation of secure, safe, cost effective and easily maintained areas.
- 1.9 The interim land clearance treatment options should not hinder or impinge upon any future use or remediation of the Crown owned residential red zone land. Future or interim land uses are yet to be assessed or advised by the Crown and are yet to be defined.

- 1.10 The scope of this report does not include determination and advice for interim or future residential red zone land uses or end states.
- 1.11 This report should be read in conjunction with the Residential Red Zone Vegetation Retention and Interim Land Clearance Treatment Methodologies prepared by Boffa Miskell.

2.0 Report Area Location

Site Location

- 2.1 The area covered by this report includes all residential red zone areas as at 31 October 2012. The report does not apply to red zone properties on the Port Hills.
- 2.2 Refer to Figure 1 below for residential red zone extent.



Figure 1: Residential Red Zone Extent

3.0 Assumptions and Limitations

- 3.1 The assumptions noted in *Interim Land Clearance Treatment Methodology – Version 1.0*, issued on 27 November 2012 also apply to this report.

4.0 Methodology

Methodology Summary

4.1 The review and analysis of 'Grassland' and other treatment areas defined in the *Interim Land Clearance Treatment Methodology* were based primarily on the factors of:

- Visibility/profile (ranging from highly visible to isolated) from surrounding features such as:
 - Boundaries between residential red zone and green zone areas
 - Main arterial roads and access routes into remaining residential areas
 - High profile waterway/recreational routes (Ōtakaro /Avon River, Kaiapoi River)
- Surrounding landscape, ecology and physical context
- Other known site features.

Visibility/Profile

4.2 The visibility of the cleared Crown owned residential red zone blocks from surrounding features including neighbouring green zone areas, main arterial roads and recreational routes (where people pass through the residential red zone) are important factors that we have considered for the categorisation of 'Grassland' areas.

4.3 We consider the surrounding features noted above to have an order of priority in regard to residential red zone visibility.

- Residential Red Zone/Green Zone boundaries are most important – people living next to the residential red zone have the most visual exposure to the red zone and the most potential inconvenience from ongoing works.
- Main arterial roads and access routes into remaining residential areas have less priority than the red zone / green zone boundary areas, but are still important to identify and consider. Many main arterial and feeder roads through the residential red zone will continue to be used by motorists, public transport and cyclists and the margins of these areas will be highly visible. In a few specific cases, residents will be required to drive through the residential red zone to reach their green zone homes and have no other access options. Special consideration needs to be given to the treatment of these routes.
- High profile waterways/recreational routes such as the Avon River are and will continue to be utilised by residents for recreation purposes (rowing, kayaking, cycling, walking, running, etc). The residential red zone margins of these areas will be also be highly visible.

4.4 We have used GIS mapping to develop buffers around the features noted above. Arbitrary distances were selected and reviewed in the field as part of our site visit work.

The following buffers were applied to the residential red zone areas:

- Residential Red Zone/Green Zone boundaries – 70 metres

- Main arterial roads and access routes into remaining residential areas – 50 metres
- High profile waterways/recreational routes – 50 metres

The setbacks selected are not intended as a definitive line where one category of treatment ends and another starts, but as a guide to how the land might be divided and grouped. Rationalisation of blocks of land depending on the location of roads and streams is also a contributing factor.

- 4.5 The buffer distances noted above were checked on site. Distances of 50 to 70 metres appeared to be adequate in terms of distance that may be required to provide a more intensive level of 'Grassland' treatment.



Figure 2: Dallington – View across block from Moyna Avenue to Ferner Street

In the photo above the planting at the end of the property is approximately 50 metres from the point the photo was taken from, the Hilux truck in the distance is approximately 100 metres away.

The size of particular categories of treatment may be greater than the buffer distances reviewed when 'Grassland' treatment areas are rationalised and factors such as existing roads and block sizes are considered.

- 4.6 An iPad and ARCGIS online was used during our site visit to approximate locations and distances.

Surrounding Landscape, Ecology and Physical Context

- 4.7 As part of the site visit work, the landscape, ecology and physical context of areas neighbouring the residential red zone was recorded. The appearance of surrounding areas is another factor that we have considered in the categorisation of 'Grassland' areas.
- 4.8 The residential red zone covers a large area with varying context – from urban areas in the Avon corridor and Kaiapoi, to a rural setting in Brooklands, and a beachside 'bach' character in Pines Beach and Kairaki.
- 4.9 The differing appearance of the various areas surrounding the red zone influences the categorisation of the 'Grassland' areas and the level of treatment required.
- 4.10 Ecological values within or in the vicinity of the Residential Red Zone were mapped in the *Interim Land Clearance Treatment Methodology* Report. These were considered alongside the Vegetation Retention Methodology to consider the ecological character of the 'Grassland areas' and whether any additional treatment was required.

Other Site Features

- 4.11 Other notable site features such as vegetation cover, prevalence of protected trees, neighbouring facilities such as the holiday park at Kairaki, reserves and parks have also been considered in the development of categories for 'Grassland' areas.
- 4.12 Archaeological values and specific sites have been mapped previously as part of the *Interim Land Clearance Treatment Methodology*. These locations will need to be identified as part of the specifications and documents for block clearances and treated in accordance with the Cultural Heritage Accidental Discovery and Archaeological Sites Protocols developed as part of the *Interim Land Clearance Treatment Methodology*.

5.0 Analysis and Treatment Areas

- 5.1 Our site visits and GIS work allowed us to analyse the Treatment Areas as originally proposed in the *Interim Land Clearance Treatment Methodology*. The following observations and alterations were made.

Alterations to Original Mapped Treatment Areas

- 5.2 The site visit ground checking and further GIS work revealed some aspects of the proposed treatment area options mapped in the *Interim Land Clearance Treatment Methodology* that require minor amendment including:
- All but one of the drains / waterways noted in the Avonside Loop area, adjacent to the Trinity Church at Avonside Drive, in Dallington near Ferner Street, adjacent to Brooklands Reserve in Brooklands, and in Featherston Avenue in Kairaki do not require Riparian Buffer Protection (Treatment Option 2 in the *Interim Land Clearance Treatment Methodology*).
 - A localised area in the Avonside Loop in the vicinity of Keller and Bracken Street is very wet, with considerable areas of standing water. Wet Area treatment will likely need to be implemented in these areas.
 - An area in Bexley bound by Wairoa Street and the Avon River originally mapped as Wet Area due to significance land subsidence is not as wet as anticipated. Dryland weed species are colonising this area, and while the flood bank protection remains in place this is unlikely to change. This area should be changed to Grassland.
 - The Riparian Buffer Area on the east side in Brooklands should be reduced in width to 5 metres adjacent to the estuary land.

Treatment Areas to Remain Unchanged

- 5.3 Treatment Areas described in the *Interim Land Clearance Treatment Methodology* that shall remain unchanged in terms of location and boundary (aside from the changes noted above) include:
- Treatment Area 2 – Riparian Buffer Areas
 - Treatment Area 3 – Dune
 - Treatment Area 4 – Estuarine Edge
 - Treatment Area 5 – Wet Areas
 - Treatment Area 6 – No Clearance Treatment

As anticipated, a single template specification only needs to be developed for each treatment area. Varying categories within these treatment areas are not required.

Grassland Treatment Area Categories

- 5.4 The grassland treatment area defined in the *Interim Land Treatment Clearance Methodology*, as Treatment Area 1, covered the majority of the residential red zone. Various levels of treatment within the grassland area can be achieved. As discussed in the methodology we have reviewed the grassland treatment areas in relation to visibility from surrounding features, the surrounding landscape, ecology and physical context and other site features.
- 5.5 Grassland treatment areas have been classified into four categories A, B, C, D covering approximately 10 ha, 229 ha, 89 and 126 ha respectively. These are described below including the locations, as shown in *Appendix 2 – CERA RESIDENTIAL RED ZONE Block Clearances –Interim Treatment Area Category Plans*, and the general extent of works.

Grassland Category A: High Profile Treatment

INTRODUCTION

- 5.6 These areas are limited and related to specific locations, such as areas where residents in green zone areas must pass through an adjacent red zone area to reach their homes and there are no other access routes.

CATEGORY A LOCATIONS

- 5.7 Parts of Courtenay Drive, East Kaiapoi, Sutton Place and Landy Street Block covering a total of 10 ha.

CATEGORY A WORKS

- 5.8 The standard of finish in these areas should be equal to or better than the Courtenay Drive trial block. If considered appropriate by CERA some planting could be included in these areas.
- 5.9 Consideration should be given to retaining groups of established vegetation where appropriate (and in accordance with the *Vegetation Retention Methodology*).
- 5.10 Stone burying, soil importation, shaping, seeding, weed control, and a high level of maintenance will be required in these areas.
- 5.11 Bollard and chain or wire fencing maybe considered for use rather than post and five wire fencing around Grassland Category A areas. Locations need to be determined on a site by site basis by CERA.
- 5.12 Single, or isolated groups of few properties, such as at the corner of Linwood Avenue and Woodham Road, could also be included in this category, and have bollard fencing and alternative seeding species such as wild flowers planted.

Grassland Category B: Intensive Treatment

INTRODUCTION

- 5.13 These areas are predominantly located adjacent to prominent features such as red zone/green zone boundaries, main arterial roads, etc and have high visibility.

CATEGORY B LOCATIONS

- 5.14 The surrounding context of Category B areas is predominantly urban / suburban, with well kept neighbouring residential properties.

- 5.15 This includes 229 ha across parts of Avon Loop, Avondale, Avonside Loop, Bexley North, Brooklands, Burwood, Courtenay Drive, Dallington, Dallington Loop, East Kaiapoi, Hilton Block, Holy Trinity Block, Horseshoe Lake, Kate Sheppard Block, Lake Terrace Block, New Brighton 2, New Brighton Block, Porritt Blocks, River Road Block, Southshore and Wainoni Block.

CATEGORY B WORKS

- 5.16 The finish of Category B areas should be at least equal to the surface finish of the Courtenay Drive trial block, but with a greater coverage of vegetation retained.
- 5.17 We anticipate that there will be more vegetation retained in many of the proposed Category B areas when compared to the completed trial block at Courtenay Drive.
- 5.18 The Courtenay Drive Exit Report should be used as a basis and to inform specifications for Category B areas. Seed type will be included in the template specifications.
- 5.19 Works are likely to include stone burying, contouring, soil importation, seeding, shaping, weed control and higher levels of maintenance.
- 5.20 Red zone/Green zone boundary treatments, as suggested in the *Interim Land Clearance Treatment Methodology* will need to be incorporated into Category B treatment areas and specifications. Category B areas include the majority of these boundary areas.
- 5.21 Treatment in Category B areas could be described as being more intensive.
- 5.22 Bollard and chain or wire fencing maybe considered for use rather than post and five wire fencing around Grassland Category B areas. Locations need to be determined on a site by site basis by CERA.

Grassland Category C: Intermediate Treatment

INTRODUCTION

- 5.23 These areas are predominantly located where visibility from surrounding features such as roads and green zone properties is less than Category A and B.

CATEGORY C LOCATIONS

- 5.24 Some Category C areas are also located where the context could be described as semi rural.
- 5.25 Category C areas are classified in parts of Avonside Loop Internal, Burwood, Dallington, East Kaiapoi, Kairaki, Kate Sheppard Block, Pines Beach and Wainoni Block and covers approximately 89 ha of land.

CATEGORY C WORKS

- 5.26 The finish to these areas is less maintained than the trial area in Courtenay Drive.
- 5.27 Again, we anticipate that a greater amount of vegetation will be retained than the completed trial area.
- 5.28 The modification to ground in Category C areas is anticipated as being less than Category B areas. A lesser amount of grading/contouring will be required – with only large hollows from demolition filled and sharp land edges smoothed off.
- 5.29 Again the Courtenay Drive Exit Report should be used to inform specifications for the Category C areas. Works may include stone burying, light contouring, seeding, soil

importation, weed control and a lower level of maintenance. Seed type will be included in the template specifications.

- 5.30 In Category C areas a concerted effort should be made to taking a 'lighter approach' to interim land clearance treatment, once demolitions are complete. Existing turf/grassed areas should be retained with the objective of 'filling in the gaps' where structures have been removed.
- 5.31 There may be minor specification differences between Category C areas in the Avon Corridor urban / suburban areas compared to those at Pines Beach / Kairaki due to contextual and soil condition differences. These will be established during the specification works.
- 5.32 The intensity of treatment in Category C areas could be described as 'intermediate'.



Figure 3: Beach community context of Pines Beach



Figure 4: Rural and Dune Context of Pines Beach

Grassland Category D: Low Treatment

INTRODUCTION

- 5.33 Category D treatment areas are predominantly in low visibility areas, located away from existing green zone residential areas, major routes etc.

CATEGORY D LOCATIONS

- 5.34 The context of these areas could also be described as semi rural/rural or isolated and include Horseshoe Lake, Brooklands and parts of Bexley and covers approximately 126 ha of land.

CATEGORY D WORKS

- 5.35 The finish of these areas is not manicured and can have a rural context/aesthetic (longer grass, greater undulation etc).
- 5.36 Vegetation in these areas will provide considerable areas of retained coverage, especially in the Horseshoe Lake and Brooklands areas.
- 5.37 Modification or contouring/shaping of the land in Category D areas is not a priority – smoothing off of edges where structures have been demolished will be required – but large amounts of soil filling/spreading is not recommended.
- 5.38 Again a ‘light’ approach to interim land clearance should be implemented – with existing turf / grassed areas retained and the ‘gaps’ seeded.

- 5.39 Some stone burying, very light contouring/shaping, minimal filling/soil spreading, weed control and seeding will be specified. Seed type will be included in the template specifications.
- 5.40 A low level of maintenance in Category D areas shall be required – with infrequent mowing or light stock grazing used as a management technique.
- 5.41 The intensity or treatment in Category D areas could be described as being low.

All Categories

- 5.42 In all grassland treatment category areas, the ground condition after demolition of houses remains an issue. Predominantly piled houses have a 'soil' ground condition after removal, but newer slab foundation houses do still appear to leave a gravel/pit run surface when removed. The result of this is twofold. 'Soil' ground conditions can be mowed more easily; these areas are generally being occupied by low growing exotic grass and herb/weed species. These can be more easily maintained and controlled.
- 5.43 'Gravel/pit run' surfaces are also being colonised by exotic weeds, but larger, taller growing dryland species predominate. The gravel is harder to mechanically mow or clear. Through all grassland treatment category areas 'gravel' ground conditions will need to be included in the template specifications in all treatment areas.



Figure 5: Site with gravel, foundation and building debris left behind, being colonised by taller weeds.



Figure 6: Site at Pines Beach where likely piled house removed and colonised quickly with grass.

Fencing

- 5.44 For all but Grassland Treatment Category A and B areas, timber post and seven wire fencing is still considered the most appropriate and cost effective fencing option.
- 5.45 This style of fencing has a lower visual impact than other fencing types such as timber or wire mesh.
- 5.46 In some Grassland Treatment Category A and B areas, bollard and chain/wire barriers may be considered. Locations and extents need to be determined on a site by site basis by CERA.

Treatment Around Expired Offer Properties & Residents Who Choose To Stay In Red Zone Areas

- 5.47 In the interests of being a 'good neighbour', CERA should undertake a higher level of maintenance to cleared and treated land around residents remaining in the red zone.
- 5.48 A higher level of maintenance should extend to the properties immediately around the properties of those who are staying.
- 5.49 The proposed treatment type / category should not be altered around remaining properties.

6.0 Recommendations

- 6.1 Review and confirm proposed category areas.
- 6.2 Advance to preparation of template specification for treatment areas and categories.

7.0 Confirmations

- 7.1 The confirmed locations for next trial blocks are shown below.
- 7.2 Trail block locations are confirmed at Gayhurst Road / Locksley Avenue in Dallington and New Brighton Road / Locksley Avenue / Goodman Street in Burwood.



Figure 7: Trial Clearance Area – New Brighton Road / Goodman Street - Burwood



Figure 8: Trial Clearance Area - New Brighton Road / Locksley Avenue - Dallington

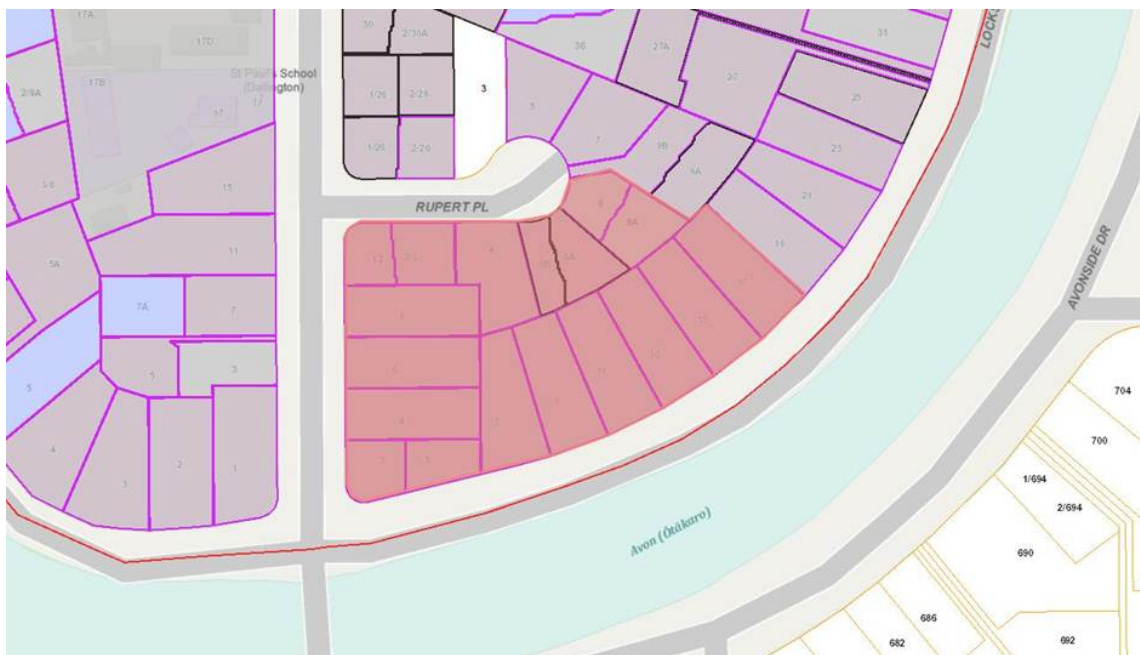


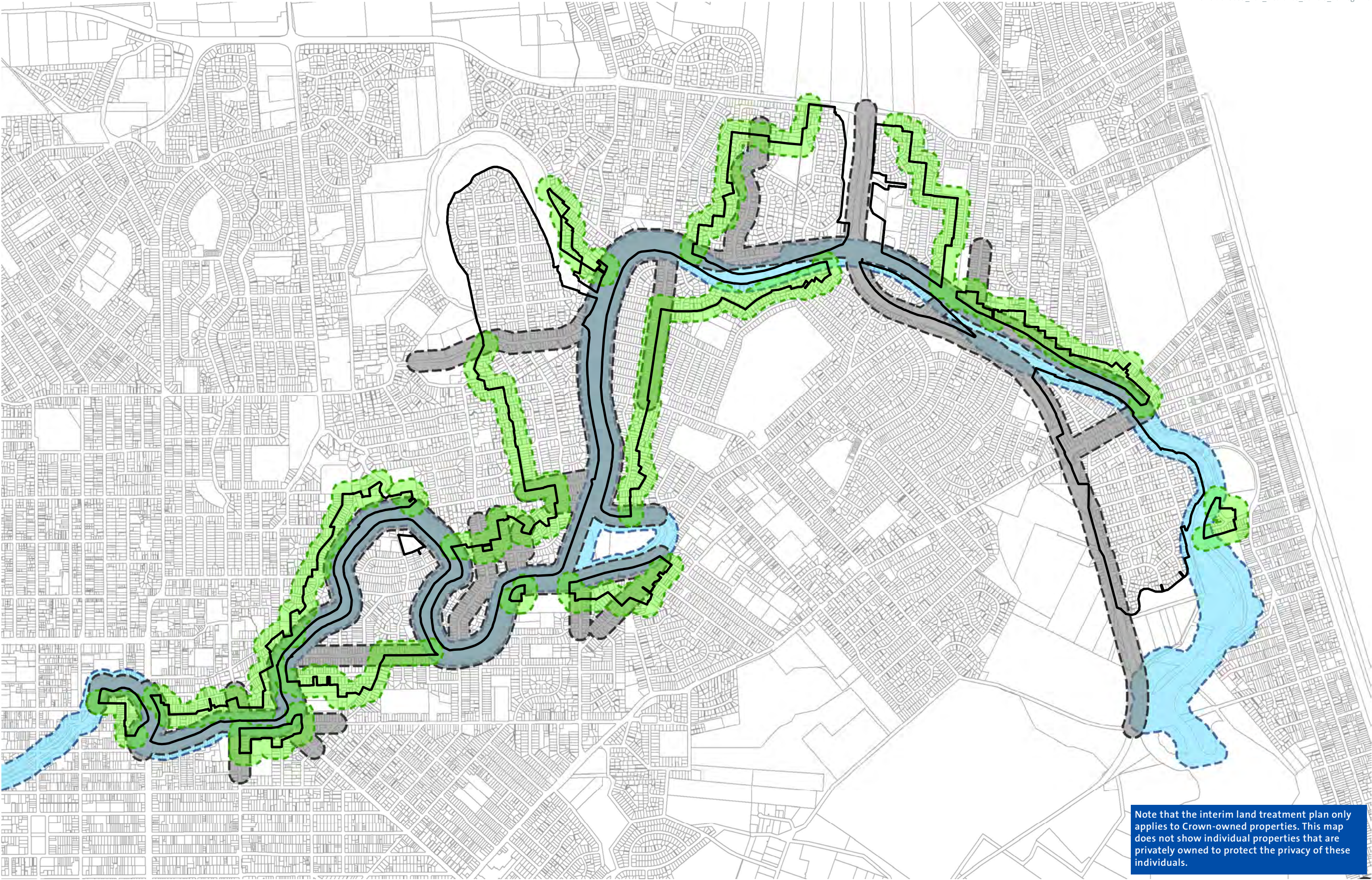
Figure 9: Trial Clearance Area - Gayhurst Road / Locksley Avenue / Rupert Place - Dallington

8.0 References

BML (2012). *Residential Red Zone: Interim Land Clearance Treatment Methodology – Version 1.0*. Report Prepared by Boffa Miskell Ltd for Canterbury Earthquake Recovery Authority and Land Information New Zealand. Report No: C11109_011c_Land_Clearance_Treatment_Report_20121127.docx

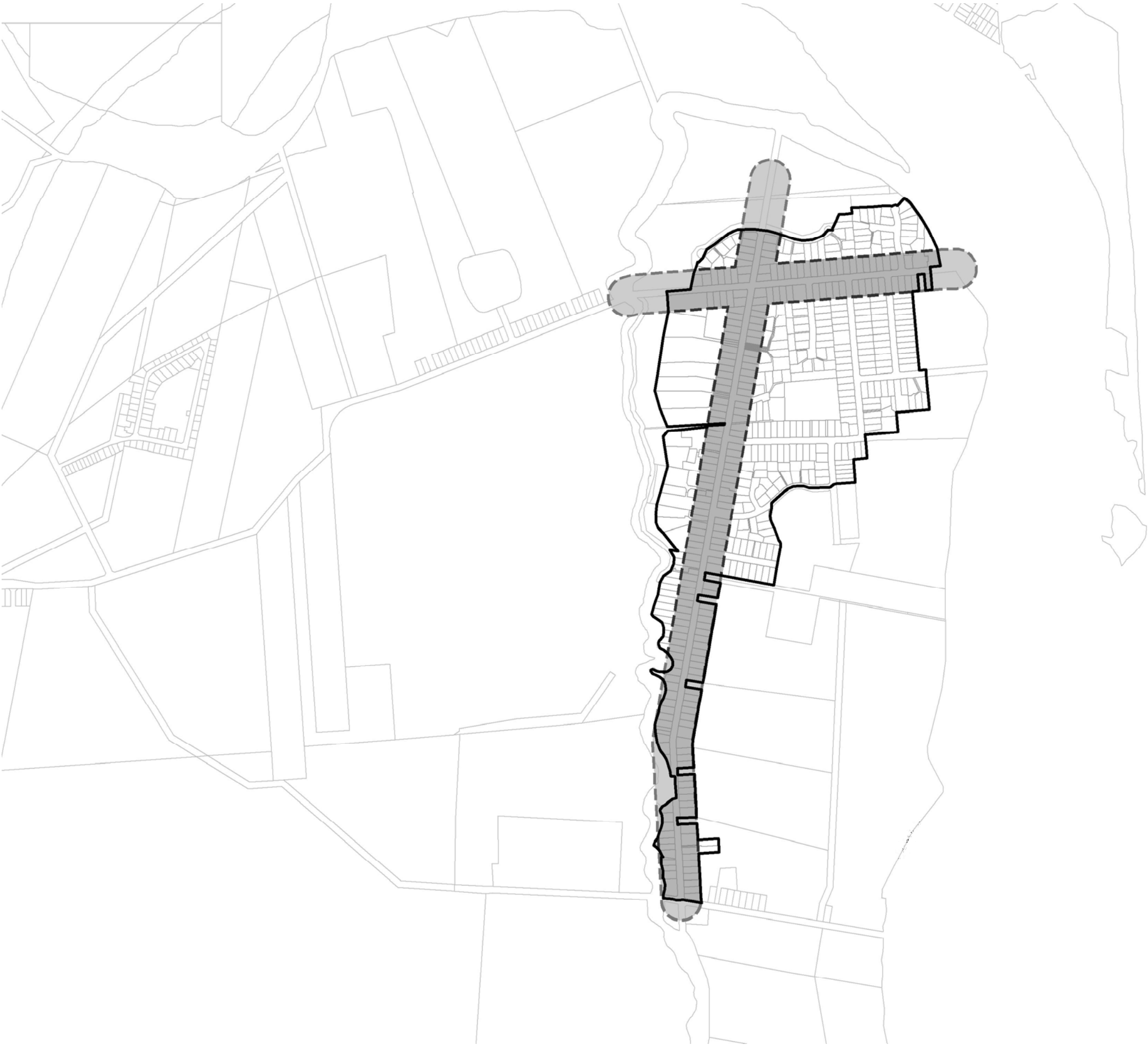
BML (2012). *Residential Red Zone: Vegetation Retention Methodology – Version 2.0*. Report Prepared by Boffa Miskell Ltd for Canterbury Earthquake Recovery Authority and Land Information New Zealand. Report No. C11109_005e_Vegetation_Retention_Methodology_20121114.docx

Appendix 1: CERA RESIDENTIAL RED ZONE Block Clearances – Interim Treatment Area Category Buffers

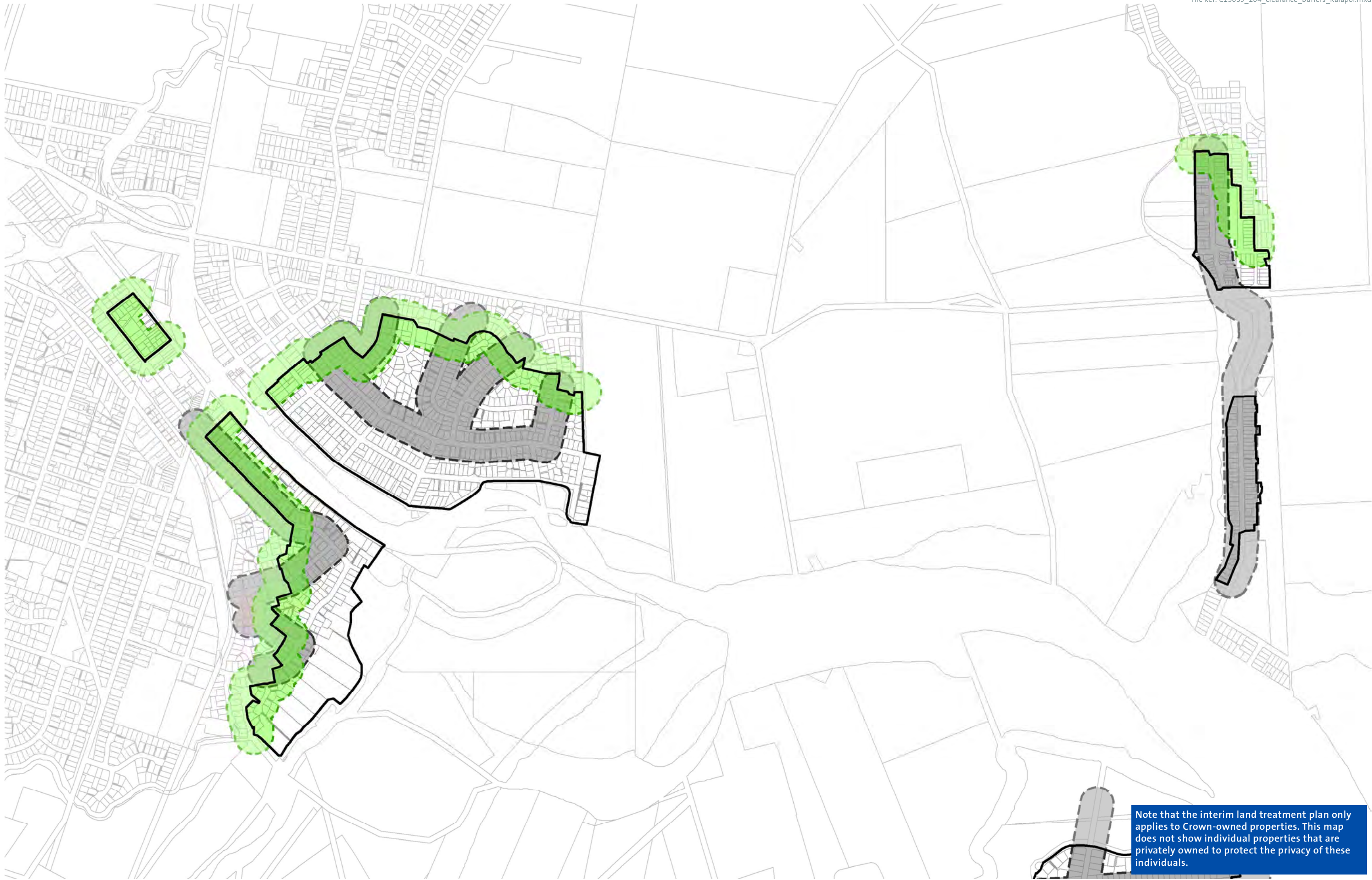




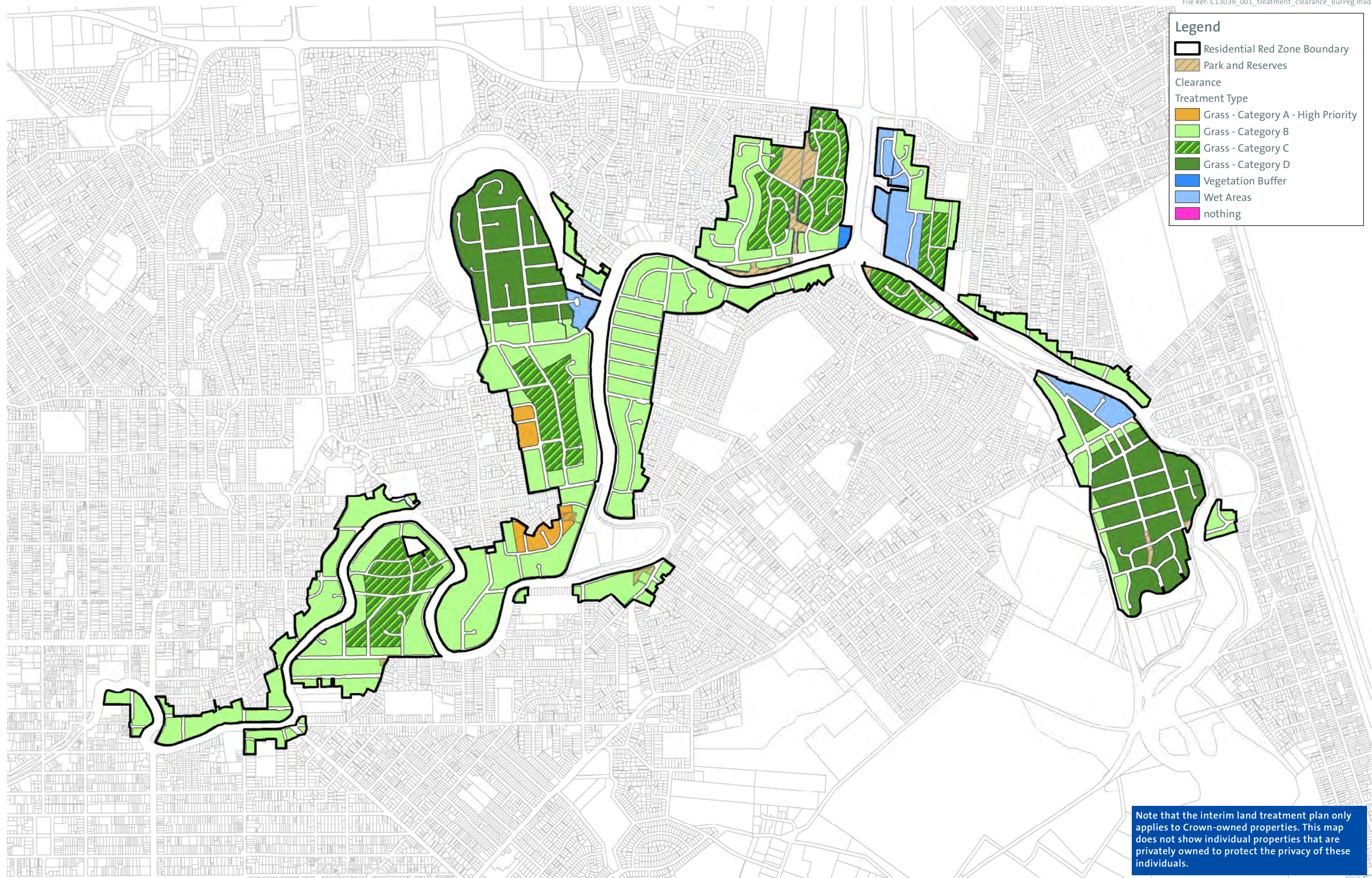
Note that the interim land treatment plan only applies to Crown-owned properties. This map does not show individual properties that are privately owned to protect the privacy of these individuals.



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Appendix 2: CERA RESIDENTIAL RED ZONE Block Clearances – Interim Treatment Area Category Plans

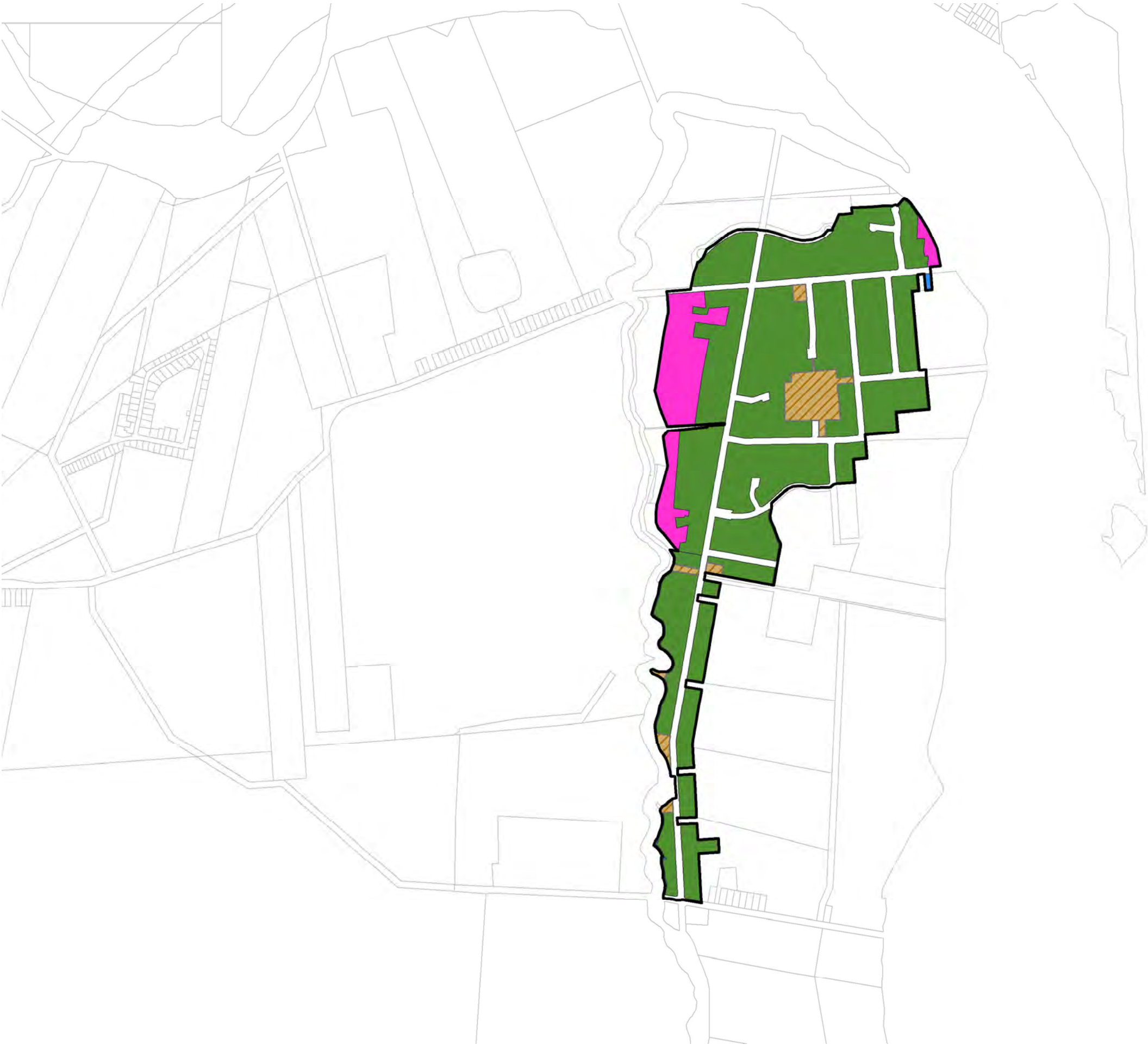




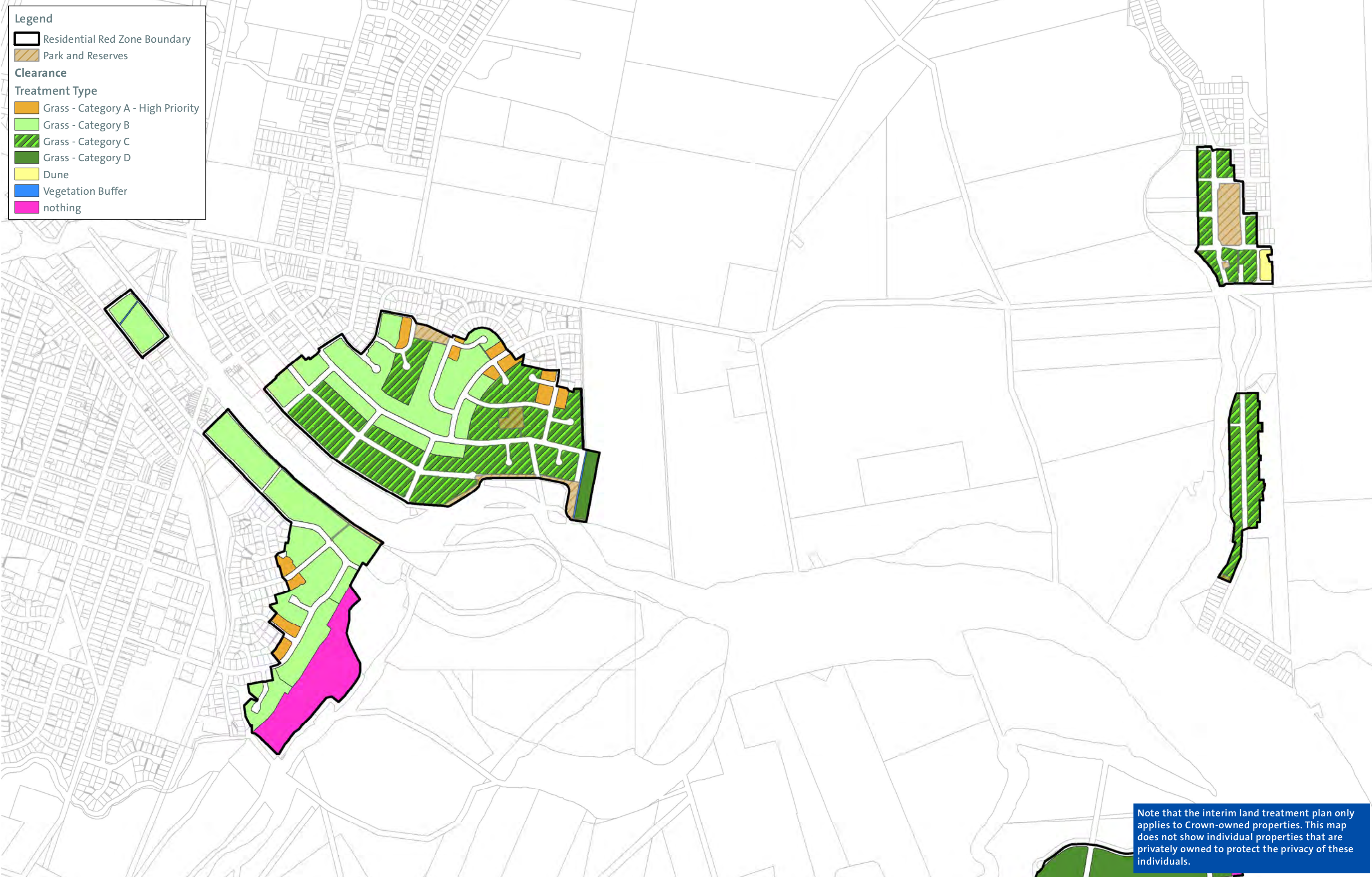
Legend

- Residential Red Zone Boundary
- Park and Reserves
- Clearance
- Treatment Type
 - Grass - Category B
 - Dune
 - Estuarine Edge

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Legend

Residential Red Zone Boundary

Park and Reserves

Clearance

Treatment Type

Grass - Category A - High Priority

Grass - Category B

Grass - Category C

Grass - Category D

Dune

Vegetation Buffer

nothing

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