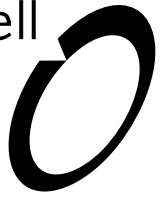


Boffa Miskell



Sutton Block Expansion

Landscape Effects Assessment
Prepared for Stevenson Aggregates Limited

24 March 2025





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Executive Summary

Introduction and Project Background

Stevenson Aggregates Limited ('the applicant') is proposing a quarry expansion (the 'Project') to extend the life of its Drury Quarry Operation which has been operating for approximately 80 years. A range of mitigation measures are proposed as part of the Project. Of particular relevance to this assessment is the provision of mitigation planting within the landholding. This report assesses the potential Natural Character, Landscape and Visual effects as a result of the Project.

Existing Environment

The Project occurs within the applicant's landholding (the 'landholding'), to the northeast of the existing quarry. The area of the proposed quarry expansion is known as the Sutton Block ('the site'). The site is characterised by an operating farm which occupies a series of connected and enclosing ridges. The landcover of the site is primarily pasture. A series of gullies also contain pockets of indigenous and exotic vegetation, wetlands and streams which drain toward Hingaia Stream. Features of note in the context of the site (beyond the footprint of the Project) are the existing quarry to the south west, Kaarearea paa (a distinctive vegetated volcanic feature of cultural significance) to the south, and an Outstanding Natural Landscape ('ONL')¹, to the north. The majority of the Project falls within the Special Purpose – Quarry Zone of the Auckland Unitary Plan ('AUP'). Limited areas of the Project do however extend outside of this zone into the adjoining Rural – Mixed Rural Zone.

Assessment of Effects

The effects covered in this assessment include those that can occur in relation to changes to landscape attributes and values, character and visual amenity (i.e. viewing audiences and their outlook), in addition to natural character effects in relation to the waterbodies that occur within the Site. The effects described in this assessment are considered with the proposed mitigation measures implemented.

Effects on Natural Character

In relation to natural character, any streams or wetlands within the footprint of the quarry pit will be removed although much of these features are located within the Special Purpose – Quarry Zone and as such there is a level of anticipation that these features could be impacted through quarry activities. A stream diversion will occur with the outcome of the diversion resulting in a highly modified section of the watercourse. Offsetting is principally proposed to manage the adverse effects of stream and wetland loss. The greatest effects will be on Stream 1, 2b and the upper and middle portions of Stream 2. Without mitigation effects would be **Moderate-High**, however in considering the offsetting and compensation together with the underlying zoning effects would range from **Low to Moderate**. The effects on the remaining streams will range from **Low-Moderate** to **Low** adverse

¹ Ponga Road (ONL Area 60)

prior to mitigation however in considering offsetting and compensation together with the underlying zoning effects, would reduce to **Very Low**.

Natural character effects will also occur on wetlands, with the greatest effects on Wetland 2a which also holds the highest degree of natural character. These adverse natural character effects are anticipated to be **Moderate** in level before mitigation, and **Very Low** in considering offsetting and compensation together with the underlying zoning. The remaining wetlands are either outside of the footprint of the Project (Wetland 3 and 8), or subject to **Low-Moderate** adverse natural character effects, reducing to **Very Low** when taking into account mitigation and zoning.

Effects on Landscape Characteristics, Attributes and Values

The landscape characteristics of the site will be impacted as the site will change from grazed pastoral farming with indigenous bush areas to a quarry land use. Consideration is however given to its underlying zoning which generally anticipates quarrying activities. While activities will also occur in the context of an existing quarry (Drury Quarry) which forms a distinctive characteristic of the site it is recognised that the expansion, particularly beyond the northern and eastern ridges, outside of the Special Purpose – Quarry zone will mean the activity will impact a different landscape catchment more associated with attributes of greater value (e.g. SEA and ONL). With the above in mind, it is considered that the Project will result in **Moderate** adverse landscape character effects.

The Project will involve a substantial change to the topographical characteristics of the site, and in time, lower the northern and eastern ridge within the site. The Project will however avoid the ONL to the north (for which topographical characteristics in addition to vegetation form part of its values). The applicant has also been cognisant of the Project's proximity to Kaarearea paa. The Project will avoid the identified Historic Heritage Extent of Place Overlay in the AUP for the paa and includes an additional setback from this feature.

The Project will require the removal of approximately 16.78ha of indigenous vegetation. Approximately 62ha of revegetation and 108ha of enhancement planting (both on and off site) is proposed to mitigate this removal. Once these areas of revegetation have established it is considered effects will be **Low-Moderate**.

In relation to addressing wetland and stream loss, due to the nature of the Project and limited options within the landholding, an offset and compensation approach to wetland and stream loss has been undertaken whereby restoration and enhancement will occur.

Overall, it is considered landscape effects on the wetlands and streams of greater value will be **Low-Moderate**. Effects on streams and wetlands which are more degraded will be **Low**.

Visual Effects

Visual effects will vary dependant on the nature of the viewing audience, distance to the site and extent of views. Mitigation planting forming part of the Project will be established in the early stages (i.e. upon granting of consent) to assist in minimising views of the Project. It is accepted that not all views can be entirely screened and the Project largely occurs in a zone where quarry activities are anticipated. In summary it is considered the effects will be as follows for the identified groups of viewing audiences:

- Group 1 are defined as those viewing audiences relating to Macwhinney Drive and publicly owned Macwhinney Reserve. These viewing audiences will experience effects considered **Low** adverse though Stage 1 and 2. **Very Low** visual effects are considered to ensue for Stage 3, 4 and 5 due to their views being screened by indigenous vegetation.
- Group 2 includes those viewing audiences along Fitzgerald Road, Fielding Road and Cossey Road. These viewing audiences will experience **Very Low** adverse effects as a result of the Project in part due to the existing composition of the views and works in Stages 2, 3, 4 and 5 broadly occurring beyond an elevated landform.
- Group 3 broadly includes viewing audiences in the Business zone land (including industrial) to the west as well as more distant residential land to the west and south west of the landholding. Adverse visual effects on these viewing audiences as a result of the project are anticipated to be **Very Low**. This is in part due to the Project not considered to be resulting in substantial change from these locations. Additionally, the context of the existing quarry and has already impacted values attached to these views for industrial, residential and transient road users.
- Group 4 includes those viewing audiences along low elevation north facing slopes of Ararimu Road, south west of the landholding. Adverse effects are considered to range from **Very Low**, **Low** and **Moderate** with the greater effects as a result of the cumulative impact of quarrying activities in the context of Kaarearea paa, its further reduction in visual integrity and associative and perceptual values.
- Group 5 viewing audiences include those along Peach Hill Road although this is restricted to a small section where views of the site are attained. It is anticipated that elevated viewing audiences along the southern portion and Northern portion of Peach Hill Road will experience **Low** adverse effects due to a limited extent of the Project being visible.
- Group 6 includes Residents along elevated north facing slopes of Pratts Road, Otto Road, Ararimu Road, Hiwinui Road, Fausett Road and the elevated portions of Maxted Road. These areas will obtain broadly elevated views towards the site. Adverse visual effects on these viewing audiences are anticipated to range between **Low** and **Moderate**. With the more elevated visual effects occurring in the later stages of the Project due to a greater extent of the project being visible in addition to views of the eastern ridge in particular, being modified during Stage 5.
- Group 7 viewing audiences include road users of State Highway 1 (SH1) in addition to those to the west including residents and road users in predominantly lowland agricultural areas such as Great South Road. These viewing audiences would obtain east facing views of the site which capture the established attributes of the quarry landscape characteristics. It is considered adverse visual effects will range between **Low** and **Moderate** for these viewing audiences. The most elevated effects will tend to occur during Stage 3,4 and 5 and will be as a result of the combined impact of quarrying activities in the context of Kaarearea paa, reduction in visual integrity and the associative and perceptual values.

- Group 8 are those viewing audiences along Sonja Drive, Laurie Drive and Ponga Road to the north of the site. These viewing audiences are anticipated to obtain the most elevated adverse visual effects ranging from **Low-Moderate to Moderate-High**. This is in part due to their proximity to the works and that the areas which are most proximate and visible will be the elevated benching near the Pit rim where it occurs outside of the Special Purpose – Quarry Zone. Large portions of the Project would however remain screened by exotic tree planting along the toe of the northern bund along the north eastern periphery of the pit rim.

The assessment concludes that apart from a small number of viewing audiences to the north of the site who may experience **Moderate-High** effects, the adverse effects on the site's natural character, landscape, and visual amenity—as well as the surrounding landscape—are largely in line with expectations based on the site's zoning. Furthermore, adverse effects are addressed through a combination of avoiding key landscape features, as well as implementing compensation, offsetting, and mitigation measures.

1.0 Introduction

Boffa Miskell Ltd ('BML') has been engaged by Stevenson Aggregates Limited ('the applicant') to assess the potential landscape and visual amenity effects of a proposed quarry expansion (the 'Project') to extend the life of its Drury Quarry Operation. The new pit would be excavated in the north eastern portion of the Applicant's property ('the Landholding') and existing pit. This north eastern area is known as the Sutton Block (referred to as 'the site' in this document) (**refer to Figure 1 and Figure 2 of Appendix 3**). This assessment has been considered in the context of the existing environment and the relevant statutory planning framework.

The first part of this report sets out the Project in its broader landscape and statutory context. The second part of this report sets out an assessment of the project within its landscape context and identifies the level and nature of landscape, natural character and visual effects. This assessment has involved a combination of on and off-site survey and fieldwork, project shaping and advice, visibility analysis, photography from representative publicly accessible viewpoints and conceptual landscape design to determine and, where required, mitigate landscape, natural character and / or visual effects.

In undertaking this assessment, the author and peer reviewer have visited the location of the Project to understand its existing landscape attributes, values and character as well as the physical and visual relationship the Site and Project has with the surrounding built and natural environment. Additionally, the visual catchment and viewing audiences of the wider area have been identified and considered.

2.0 Assessment Approach

This assessment has been undertaken and peer reviewed by NZILA registered landscape architects with reference to the Te Tangi A Te Manu, Aotearoa New Zealand Landscape Assessment Guidelines (2022) and Quality Planning Landscape Guidance Note² and its signposts to examples of best practice. This assessment has been undertaken from a Te Ao Pakeha world view using the terminology of Te Tangi a te Manu and therefore does not purport to fully understand the connection and values held by Iwi who are associated with the whenua or awa of the site and its relationship to the wider area.

The full methodology and outline of the effects ratings used in this assessment is provided in **Appendix 1**. In summary, this assessment provides ratings based upon a combination of quantitative information where available, and qualitative professional judgements by the author. The ratings are based upon a seven-point scale which includes: very low; low; low-moderate; moderate; moderate-high; high and very high ratings. These are used within this assessment to describe the level (and significance) of the potential landscape and visual amenity effects that would result from the Project.

In combination with assessing the significance of effects, this assessment also explains the likely nature of the effects, being a positive (beneficial) or negative (adverse) effect in the context within which it occurs. Benign (neutral) effects are also identified where it is considered that there is no identifiable landscape or visual change in the context of where it occurs.

2.1 Familiarisation of the Project and Receiving Environment

2.1.1 Desktop Analysis of the Project and Receiving Environment

Prior to conducting the assessment, a desktop study was completed which included a review of the relevant information relating to the landscape and visual aspects of the Project. This information included:

- The statutory setting of the Project and surrounding context;
- Base map data (such as contours and aerial photography);
- Quarry pit design and drawings (Terra Mining Consultants);
- Ecological Effects Assessment (Biosearches).

2.1.2 Review of Statutory Context

The statutory context of the Landholding and its environs was undertaken in preparation for this assessment. This included a review of the Auckland Unitary Plan (AUP).

² <https://www.qualityplanning.org.nz/node/802>

2.1.3 Review of material in consideration of Cultural Landscape Values

Mana whenua have associations to the area and we understand those that have a particular interest in the Project include Ngāti Tamaoho, Ngaati Te Ata Waiohua, Te Ākitai Waiohua, Ngāi Tai ki Tāmaki, Ngāti and Ngaati Whanaunga. Whilst no Iwi Management Plans have been identified, a number of documents were reviewed and Hui were attended to establish recognition of the cultural landscape values of the site and its context. These have included:

Deed of Settlements

- The Ngāti Tamaoho Deed of Settlement and associated schedule³
- Te Ākitai Waiohua Deed of Settlement and associated schedule⁴
- The Ngāi Tai ki Tāmaki Deed(s) of Settlement and associated schedule⁵
- Ngaati Whanaunga Deed of Settlement and associated schedule⁶

Cultural Values Assessments

- Ngāti Tamaoho Cultural Values Assessment, 2024
- Ngāti Te Ata Cultural Values Assessment Report, February 2025
- Te Ākitai Waiohua, Cultural Values Assessment (Addendum 1 and Addendum 2), April 2024 and 2025.
- Ngāi Tai ki Tāmaki Cultural Values Assessment, 7 March 2023 (Draft version)
- Ngāi Tai ki Tāmaki Letter of Response, Sutton Block Stage 5 (20 March 2025)
- Ngaati Whanaunga Cultural Impact 29 August 2024

Regarding the above documents, it is noted that reports from Ngāti Tamaoho and Ngaati Whanaunga relating to Stage 5 of the Project were unavailable and have therefore not been reviewed.

Tanagata Whenua Engagement

- Overview of Tangata Whenua Engagement Document, Stevenson, 20 March 2025
- Assessment Author, Hui attendance, 14 February 2023 and 28 November 2023

These are further outlined in **Section 4.1**.

³ <https://www.govt.nz/assets/Documents/OTS/Ngati-Tamaoho/Ngati-Tamaoho-Deed-of-Settlement-30-April-2017.pdf> and <https://www.govt.nz/assets/Documents/OTS/Ngati-Tamaoho/Ngati-Tamaoho-Deed-of-Settlement-Schedule-Attachments-30-April-2017.pdf>

⁴ <https://www.govt.nz/assets/Documents/OTS/Te-Akitai-Waiohua/Te-Akitai-Waiohua-deed-of-settlement-documents-12-Nov-2021.pdf>

⁵ <https://www.govt.nz/assets/Documents/OTS/Ngai-Tai-ki-Tamaki/Ngai-Tai-ki-Tamaki-Deed-of-Settlement-7-Nov-2015.pdf>, <https://www.govt.nz/assets/Documents/OTS/Ngai-Tai-ki-Tamaki/Ngai-Tai-ki-Tamaki-Deed-to-Amend-the-Deed-of-Settlement-27-June-2016.pdf>, <https://www.govt.nz/assets/Documents/OTS/Ngai-Tai-ki-Tamaki/Ngai-Tai-ki-Tamaki-Second-Deed-to-Amend-the-Deed-of-Settlement-28-July-2017.pdf>, <https://www.govt.nz/assets/Documents/OTS/Ngai-Tai-ki-Tamaki/Ngai-Tai-ki-Tamaki-Third-Deed-to-Amend-the-Deed-of-Settlement-28-June-2018.pdf> and <https://www.govt.nz/assets/Documents/OTS/Ngai-Tai-ki-Tamaki/Ngai-Tai-ki-Tamaki-Attachments-Nov-2015.pdf>

⁶ <https://www.govt.nz/assets/Documents/OTS/Ngaati-Whanaunga/Ngaati-Whanaunga-Deed-of-Settlement.pdf> and <https://www.govt.nz/assets/Documents/OTS/Ngaati-Whanaunga/Ngaati-Whanaunga-Attachments-Schedule.pdf>

2.1.4 Review of Project drawings

Project drawings have been reviewed as part of the assessment process. Notable drawing sets that are most relevant to the landscape and visual aspects of the Project are located in the AEE and should be referred to and reviewed alongside this assessment, in particular these include the staging plans Drawing(s) SSQ_24_401, SSQ_24_402, SSQ_24_403, SSQ_24_404, and SSQ_24_405.

2.1.5 Preparation of a Zone of Theoretical Visibility Analysis

To determine the potential visual catchment and viewing audiences of the Project, a Zone of Theoretical Visibility Analysis (ZTV) was undertaken (**refer Figures 8 to 14, Appendix 3**). The ZTV analysis was generated by using a 3D landform model of the Project, at three Project Stages (Stage 2, Stage 4 and Stage 5) to provide an understanding of the evolution of the quarry landform.

Once this base data was prepared, points were set across the quarry pit rim and upper pit benches with the analysis undertaken using computer software.

The resulting zone of visibility is shown across a colour band, with a green colour illustrating a small number of points being visible, and orange and red colour illustrating a larger number of points being visible. These areas of visibility are shown together with distance bands which have been offset from the Project. The analysis has been undertaken both using landform only (contours), in addition to taking into account above ground features which will influence the extent of visibility (e.g. vegetation).

2.1.6 On-Site Analysis of the Receiving Environment

Six site visits were undertaken in order to understand the site, the Project and the surrounding context including the likely extent of visibility of the Project. The first two site visits took place on 10th February 2022 and 4th April 2022 and focused on gaining an understanding of the components and scale of the Project, its physical impact on the landscape within the Site, and effects on the wider landscape character and visual amenity for potential viewing audiences. The third site visit to areas surrounding the site was undertaken on 24th May 2022 to take photographs from representative viewpoint locations for the proposed visual simulations. The fourth site visit took place on 11th September 2023 and involved further ground-truthing the desktop visibility analysis including visiting locations along the proposed extent of the pit and obtaining photography from these locations in the direction of identified proximate viewing audiences. A fifth (18th July 2024) and sixth (23rd August 2024) site visit were undertaken from on-site and off-site locations in relation further considering the potential landscape and visual effects arising from the final stage (Stage 5) of the Project.

2.2 Input into the Project

To inform this Project and assist with managing the potential adverse landscape, natural character and visual effects, BML has actively collaborated with the Project team through an iterative design process which has included on site discussions, and input into the overall mitigation planting strategy.

Following these inputs, BML has reviewed the application documentation, and prepared a comprehensive natural character, landscape and visual effects assessment.

2.2.1 Visual Simulations

A series of visual simulations has been prepared to provide a greater understanding of the Project and its extent of visibility within the visual catchment (**Appendix 4**). A collection of viewpoint photographs was selected as they provide representative views from a variety of viewing audiences which are located at a range of viewing distances and locations. The visual simulations have been prepared in accordance with the NZILA Best Practice Guideline for Visual Simulations⁷. To provide an accurate understanding of the Project, the visual simulations depict the quarry at a range of moments in time. These are:

- Existing view (as the Site is currently observed)
- Proposed Indicative Stage 2 (15 Years from the start of the Project)
- Proposed Indicative Stage 4 (40 Years from the start of the Project)
- Proposed Indicative Stage 5 (Life of Quarry, anticipated to be approximately 50 years)

The visual simulations also illustrate the likely growth rates of the proposed exotic and indigenous vegetation in line with the pit stages. The vegetation illustrated in the visual simulations forms part of the ecological and landscape and visual mitigation response. The landscape and visual mitigation response is outlined in **Section 6.0**, together with a brief overview of the Ecological mitigation.⁸

3.0 Statutory Context

The relevant statutory provisions are set out in the accompanying Assessment of Environmental Effects report prepared by Tonkin and Taylor ('the AEE'). A summary of the key matters of consideration relevant to this assessment are provided.

In relation to the Landscape Effects Assessment, the Resource Management Act 1991 (RMA), specifically includes matters pertaining to the preservation of natural character⁹, the protection of outstanding natural features and landscapes¹⁰ maintenance and enhancement of amenity values¹¹ and the quality of the environment¹².

3.1 The Auckland Unitary Plan

Refer Figure 3, Appendix 3

The applicant's landholding falls under the jurisdiction of Auckland Council. The site is located within two zones under the AUP, with the majority of the site being the Special Purpose – Quarry Zone and the remainder in the Rural – Mixed Rural Zone. The relevant Objectives and Policies which relate to the Application are outlined in the AEE. In summary the purpose of the Special Purpose – Quarry Zone provides for significant mineral extraction activities to ensure

⁷ http://www.nzila.co.nz/media/53263/vissim_bpg102_lowfinal.pdf

⁸ Refer to Assessment of Ecological Effects, Bioresearches for full description of ecological mitigation / offsetting

⁹ Section 6(a)

¹⁰ Section 6(b)

¹¹ Section 7(c)

¹² Section 7(f)

that it can continue in a manner that minimise adverse effects. Of particular relevance to this assessment are the assessment criteria which deal with visual amenity (H28.7.2), and require consideration of whether the activity in close proximity to dwellings mitigates significant adverse visual amenity effects through screening and landscaping.¹³ For rural zones the maintenance (or enhancement) of character, amenity values and biodiversity values are considered, while accommodating the localised character and the dynamic nature of the zone.¹⁴ Whilst the zone anticipates a predominantly working rural environment¹⁵, the AUP recognises that mineral extraction are typical features within these (rural) zones¹⁶ and within Special Purpose – Quarry Zones¹⁷, and will generally not give rise to issues of reverse sensitivity.

Another matter to consider is there are four identified SEAs located within the Landholding. These are identified as SEA_T_5346 (at the southern edge of the existing pit); SEA_T_5349 (near the southern edge of the proposed pit); SEA_T_5323 (surrounds and is within portions of the northern and eastern edges of the Site); and SEA_T_1117 (within the north-east corner of the Site).

A portion of an Outstanding Natural Landscape (ONL) is also located in the northern portion site which is the Ponga Road (ONL Area 60). The majority of the ONL is located along a series of ridges and gullies to the north, beyond the Site, with (refer **Figure 4 and 6, Appendix 3**), the AUP categorises the ONL as *“Hill country, Cultured nature / wild nature (hill country). Extensive sequence of mature and regenerating native forest, combined with strongly articulated stream corridors that reinforce the natural qualities of this rolling to dissected hill country landscape”*¹⁸. The elements, patterns and processes of the ONL are the “interplay of indigenous forest remnants and pasture, reinforcing topography.”

The natural science factors of the ONL are considered High and include a strong elevated relief as part of a wider hill sequence. Extensive areas of native forest, native shrubland and stream corridors are also evident.

The ONL also contains aesthetic values in relation to memorability and naturalness. There are very high memorability values associated with the very marked naturalness values and strong interplay of underlying topography with areas of bush and more peripheral pockets of pasture. In relation to the high level of naturalness, the ONL holds a strong sense of naturalness evident in the forest and shrubland areas, together with the terrain.

In terms of expressiveness, there are very high values and the ONL is considered to have a very apparent greywacke hill landform overlain with shrubland / forest / stream corridor sequences.

¹³ H28.7.2(b)(i)

¹⁴ H19.2.3(1)

¹⁵ (H19.2.4(1)(a)

¹⁶ (H19.2.4)(2)(b)

¹⁷ (H19.2.4)(2)(c)

¹⁸ AUP, Schedule 7

4.0 The Existing Environment

4.1 Consideration of Cultural Landscape Values

It is acknowledged that tāngata whenua perspectives in relation to landscape should be considered. It is also recognised that Māori cultural values interests and associations with the site, and the potential impacts of the Project will be identified through iwi led Cultural Impact Assessments. It is understood that the applicant has been establishing a relationship with Ngāti Tamaoho, Ngaati Te Ata Waiohua, Te Ākitai Waiohua, Ngāi Tai ki Tāmaki, and Ngaati Whanaunga through a series of site visits, hui and invitations to meet and discuss the Project. The author of this assessment attended two hui to discuss the Project.¹⁹

A review of available documentation has been undertaken. This has included a review of the Overview of Tāngata Whenua Engagement report²⁰ and associated iwi engagement minutes and actions; a review of the Ngāti Tamaoho Deed of Settlement and associated schedule²¹; the Ngāi Tai ki Tāmaki Deed(s) of Settlement and associated schedule²²; Ngaati Whanaunga Deed of Settlement and associated schedule²³; and Te Ākitai Waiohua Deed of Settlement and associated schedule. A Deed of Settlement does not exist for Ngaati Te Ata as the Claim is not yet settled.

Within these documents, there is recognition of the association between Ngāti Tamaoho and Te Ākitai Waiohua to particular areas including some which are in the immediate context of the site. For Ngāti Tamaoho these include Hingaia Stream and its tributaries, Otuwairoa Stream and its tributaries, Te Maketu Historic Reserve (south of the site) and Kaarearea paa. For Te Ākitai Waiohua this includes Te Maketu Historic Reserve.

It is acknowledged that there are multiple mana whenua customary interests in the site and wider context and each iwi have their own unique tikanga. In this respect, while some commonalities have been observed in the reviewed material, the tikanga of one iwi on a particular matter are not the same for all. It is acknowledged that places of importance are not considered in isolation and whilst they may be important in their own right, they are part of an interconnected and interrelated landscape.

A review of the received Cultural Values Assessments has also been undertaken.²⁴ Whilst the assessors are not cultural experts and do not intend to fully understand or assess these, the

¹⁹ 14th February 2023 and 28th November 2023

²⁰ Prepared by Stevenson, 15th November 2023

²¹ <https://www.govt.nz/assets/Documents/OTS/Ngati-Tamaoho/Ngati-Tamaoho-Deed-of-Settlement-30-April-2017.pdf> and <https://www.govt.nz/assets/Documents/OTS/Ngati-Tamaoho/Ngati-Tamaoho-Deed-of-Settlement-Schedule-Attachments-30-April-2017.pdf>

²² <https://www.govt.nz/assets/Documents/OTS/Ngai-Tai-ki-Tamaki/Ngai-Tai-ki-Tamaki-Deed-of-Settlement-7-Nov-2015.pdf>, <https://www.govt.nz/assets/Documents/OTS/Ngai-Tai-ki-Tamaki/Ngai-Tai-ki-Tamaki-Deed-to-Amend-the-Deed-of-Settlement-27-June-2016.pdf>, <https://www.govt.nz/assets/Documents/OTS/Ngai-Tai-ki-Tamaki/Ngai-Tai-ki-Tamaki-Second-Deed-to-Amend-the-Deed-of-Settlement-28-July-2017.pdf>, <https://www.govt.nz/assets/Documents/OTS/Ngai-Tai-ki-Tamaki/Ngai-Tai-ki-Tamaki-Third-Deed-to-Amend-the-Deed-of-Settlement-28-June-2018.pdf> and <https://www.govt.nz/assets/Documents/OTS/Ngai-Tai-ki-Tamaki/Ngai-Tai-ki-Tamaki-Attachments-Nov-2015.pdf>

²³ <https://www.govt.nz/assets/Documents/OTS/Ngaati-Whanaunga/Ngaati-Whanaunga-Deed-of-Settlement.pdf> and <https://www.govt.nz/assets/Documents/OTS/Ngaati-Whanaunga/Ngaati-Whanaunga-Attachments-Schedule.pdf>

²⁴

Ngāti Te Ata Cultural Values Assessment Report, February 2025 (Final version), Te Ākitai Waiohua, Cultural Values Assessment (Addendum 1 and Addendum 2), April 2024 and 2025 (Final version). Ngāi Tai ki Tāmaki Cultural Values Assessment, 7 March 2023 (Draft version), Ngaati Whanaunga Cultural Values Assessment & Preliminary Cultural

below provides an overview (and is therefore not exhaustive) of some of the key identified cultural landscape values and natural and physical resources (Mana and Mauri).

- Te Whenua including Viewshafts, hilltops, tuff rings, ridgelines.
- Ta Wai Maori – particularly the Hingaia Stream catchment and respective waterways (including streams, tributaries, freshwater springs).
- Ngā Kukuwai – exotic and native wetlands.
- Indigenous vegetation (forests and bush).
- Tupuna maunga, specifically (Kaarearea paa (i.e. in the immediate context of the quarry footprint), Te Maketu Pā, to the south of the wider site),
- Wāhi tapu and wāhi taonga in the area which together illustrate the networked pā occupation that existed.
- Te Mānukanuka o Hoturoa.
- Ara hīkoi (traditional walking tracks).
- Ara tapu (walking tracks of the spirits: the path that leads to Rerenga Wairua through the West Coast, or the walking tracks that leads to an urupā).

4.2 Landholding Context and Character

The Landholding is located in the South Auckland area of Drury (**refer Figure 1, Appendix 3**). The Landholding is positioned in the lower foothills of a wider series of hills which extend from the eastern extent of Papakura to the north (Redhills), down towards Hingaia Stream, near the Bombay area to the south. To the east of these hills are the predominantly agricultural lowland areas of Drury, Karaka, Pukekohe and Ramarama.

The landcover of the Landholding is a mixture of pasture, indigenous vegetation and quarry activities (i.e. existing Drury pit and associated quarry operation areas, referred to in the AEE report as Front of House (FOH) operations). **Figure 2, Appendix 3** illustrates the broad landcover types of the Landholding and wider area. Indigenous vegetation becomes more predominant in elevated areas in the north eastern portion of the Landholding. Farmland characterises most areas to the east of the Landholding. Lifestyle blocks have however been established in the area which are often accessed off roads which navigate along the hillside ridges (e.g. Pratts Road and Peach Hill Road). To the west, between the Landholding and State Highway 1, is an area of in a period of transition from a rural land use to one supporting industry (light and heavy industry), in addition to residential developments (**refer Figure 3, Appendix 3**).

To the north west of the Landholding, Future Urban Zone (FUZ) land exists indicating future development radiating out from Papakura town centre. In addition to the Landholding's Special Purpose zoning, another quarry exists to the north (Winstones Symonds Hill and Hunua Quarries), in which its surrounding context is also characterised by large lifestyle blocks and areas of pasture and vegetation.

In relation to the broad landscape features of the area, the sequence of hills supports a number of vegetated ridges and gullies which flow to the Hingaia Stream and discharge into the

Impact Assessment, 3 February 2023 (Draft version), Te Ākitai Waiohū, Cultural Values Assessment (Addendum 1 and Addendum 2), April 2024 and 2025 (Final version).

Pahurehure inlet of the Manukau Harbour. Areas of indigenous vegetation exist within the broad context in addition to areas to the immediate south and north east of the existing Drury Quarry pit which are listed as SEA in the AUP. An ONL²⁵ also exists to the north of the area. In the vicinity of the quarry pit (and partially overlapping with an SEA boundary, a historic heritage and special character extent of place called Kaarearea paa also features²⁶ (**Refer Figure 4, Appendix 3**).

4.3 The Landholding

The Landholding has a total area of approximately 562 ha and is broadly defined by Macwhinney Road and Sonja Drive to the north, Peach Hill Road to the south and Fitzgerald Road to the west (**refer to Figure 5, Appendix 3**). The Landholding extends towards to a high point of approximately 329mRL in the north-eastern portion to a low point of approximately 30mRL along Quarry Road, to the west (**refer to Figure 6, Appendix 3**).

The Landholding consists of a combination of modified, managed and unmodified areas. The north eastern portion of the Landholding primarily contains elevated hillside country and supports a large area of indigenous vegetation forming a large part of an SEA²⁷ which enters the Landholding. An approximately 1.9ha pine forestry block is also located in this area and straddles the interface where indigenous vegetation meets adjacent pasture.

To the west of the aforementioned vegetated hillsides is a large elevated broad valley landform primarily occupied by exotic pasture. This area loosely defines the Site where the proposed quarry expansion extent is located. The landform is broadly defined by a series of connected ridges reaching elevations between 200mRL to 230mRL the west ('Western Ridge'), 350mRL to 270mRL to the north ('Northern Ridge') and 280mRL to 255mRL to the east ('Eastern Ridge'). The elevation of the site reduces to approximately 160mRL in the central area between the surrounding ridges.

Whilst pasture forms the primary vegetation type in the Site, the gullies contain disconnected pockets of indigenous vegetation (including an SEA), in addition to an area of vegetation in the south eastern portion of this broad valley that connects (and is part of) the indigenous vegetation to the east. The low points contain a series of linear wetlands and local streams (**refer Figure 7, Appendix 3**) also exist in the Site which drain toward Hingaia Stream. A remnant stand of Pine exists to the west of the largely pasture covered broad valley landform. This Pine is intermixed with indigenous vegetation stands and forms a backdrop to the residential properties along Macwhinney Drive. Further discrete areas of pine occur in pockets in the northern portion of the site, either meeting the interface with the pasture or grouped within the wider context of indigenous vegetation beyond the extent of the adjacent SEA.²⁸

Another area of Pine exists adjacent to a distinctive vegetated volcanic feature, Kaarearea paa which reaches approximately 215mRL. This landform also features one of the Landholding SEA's²⁹, and it is also noted that this feature is protected as a Historic Heritage Extent of Place Feature in the AUP³⁰.

²⁵ Area 60, Ponga Road

²⁶ Extent of Place 693 Ballards Cone pa site R12_278

²⁷ SEA_T_5323, AUP Significant Ecological Areas Overlay

²⁸ SEA_T_5323, AUP Significant Ecological Areas Overlay

²⁹ SEA_T_5349, AUP Significant Ecological Areas Overlay

³⁰ Historic Heritage Overlay Extent of Place 693, Ballards Cone pa Site R12_278

The south western portion of the Landholding is used for quarry activities (including the existing Drury quarry pit, Front of House operations and overburden disposal). The south eastern portion features west facing slopes containing minor vegetated gullies and rounded shoulders. The southern portion also features pasture covered slopes with a broadly north western aspect. It is acknowledged that in the southern portion of the site, a modestly sized solar farm is proposed in the vicinity of Peach Hill Road by the applicant of this Sutton Block Project. Whilst the solar farm proposal does not have consent, it represents a potential activity in this portion of the site. It is not considered that the scale of the solar farm proposal will affect the overall assessment of effects of the Project.

4.4 Natural Character Condition

As outlined earlier, the primary aspects of Natural Character are considered in relation to waterbodies to be the biophysical (abiotic and biotic) attributes reflecting the extent to which natural elements, patterns and processes occur and the extent to which human modification has occurred. Secondary experiential aspects associated with the context of such waterbodies and their margins has also been considered. Relevant to this application, and as outlined in **Section 3.2**, the natural character study, and analysis has been undertaken in relation to the “wetlands, and lakes and rivers and their margins” that occur within the Site, being the affected area relating to the proposed quarry expansion.

Streams, wetlands and a constructed pond have been identified and surveyed by the Project's ecologists (Bioresearches) and are illustrated below. Additionally, **Figure 7, Appendix 3**, illustrates these streams and wetlands along with other identified site features.

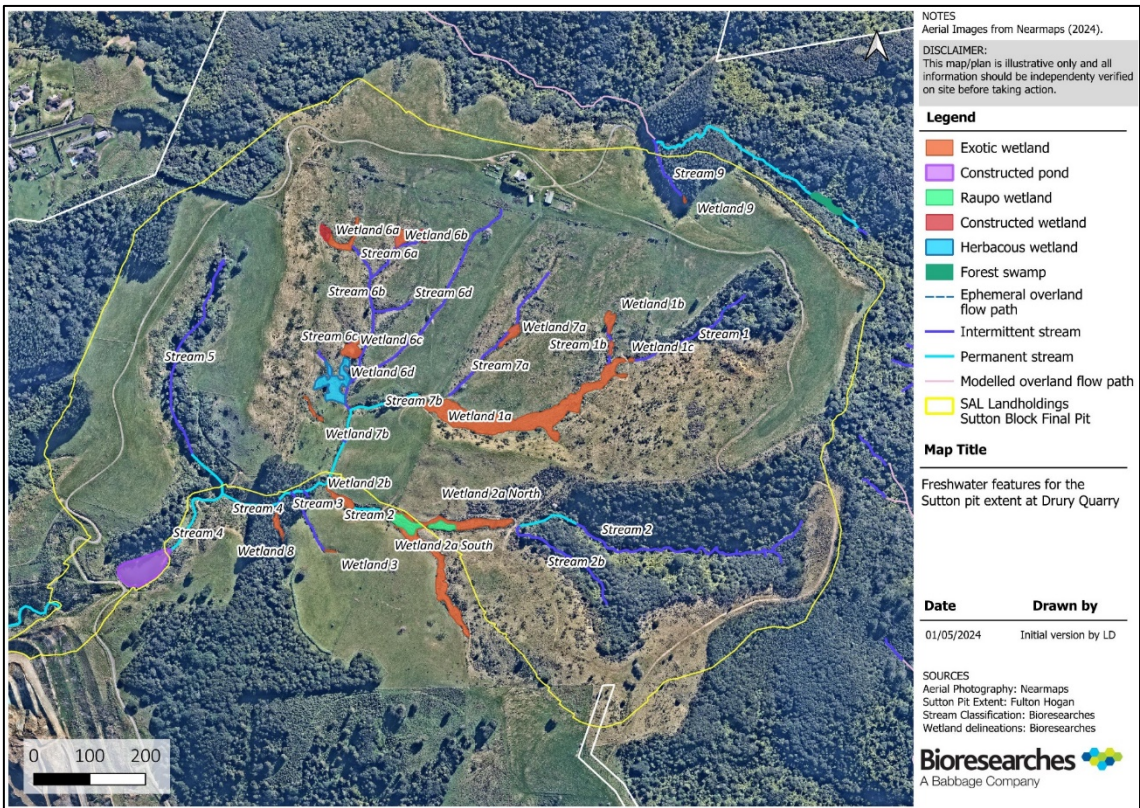


Plate 1: Surveyed freshwater ecological features (source Assessment of Ecological Effects, Bioresearches)

An evaluation of the natural character condition relating to the active bed, margins and context of waterbodies within the Site is provided in **Appendix 2**, with consideration given to the freshwater and terrestrial Assessment of Ecological Effects which will form part of the application. A summary of these findings is provided below.

Table 1: Streams

Stream Number	Degree of Natural Character		
	Biophysical Active Bed	Biophysical Margins	Experiential
Stream 1	Moderate-High	Moderate	Moderate
Stream 1b	Low	Low	Low
Stream 2	Moderate-High	Moderate-High	Moderate-High
Stream 2b	Moderate-High	Moderate-High	Moderate-High
Stream 3	Low	Low	Low
Stream 4	Moderate	Low	Moderate
Stream 5	Moderate	Low	Moderate
Stream 6	Moderate	Low	Moderate-Low
Stream 7	Low	Low	Low
Stream 9	Low	Low	Low

Table 2: Wetlands

Wetland Number	Degree of Natural Character	
	Biophysical Active Bed + Biophysical Margins	Experiential
Wetland 1a	Moderate-Low	Low
Wetland 1b	Moderate-Low	Low
Wetland 1c	Moderate-Low	Low
Wetland 2a	Moderate	Moderate-Low
Wetland 2b	Moderate-Low	Low
Wetland 3	Moderate-Low	Low
Wetland 6a and b	Moderate-Low	Low
Wetland 6c	Moderate-Low	Low
Wetland 6d	Moderate-Low	Low
Wetland 7a	Moderate-Low	Low
Wetland 7b	Moderate-Low	Low
Wetland 8	Moderate-Low	Low

Wetland 9	Moderate-Low	Low
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In summary, the streams with the highest degrees of natural character are considered to be Stream 1, Stream 2 and 2b, in the north eastern and eastern portion of the Site. The remaining streams, while providing up to a moderate natural character degree, have varying conditions, often influenced by reduced hydrological diversity, habitats and margin conditions. The impact of farming practices through stock damage, introduction of exotic species and human modification to stream corridors (e.g. culverting) reduces the associated degree of natural character.

The wetlands, while performing hydrological functions, are predominantly exotic in their biotic attributes and affected by human influences through farming practices such as stock access. Wetland 2a is considered to have the highest degrees of natural character ('Moderate' biophysical and 'Moderate-Low' experiential attributes), in part due to the presence of indigenous species. The remaining wetlands have reduced degrees of natural character. This is due to their abiotic condition (such as water quality or induced condition through farm animals), biotic condition (such as prevalence of exotic species and limited indigenous species or habitat), and experiential condition (due to the limited sense of wilderness or remoteness as a result of human influence and managed land use context).

4.5 Key Landscape Characteristics, Attributes, and Values

Refer Figure 7, Appendix 3

The key characteristics, attributes and values of the Site are broadly captured within the natural and physical environment, perceptual and associative dimensions. The special connection that iwi have with the land and the waterways is acknowledged and this relationship is important to their spiritual and cultural wellbeing.

The characteristics, attributes and values in relation to the location of the proposed quarry expansion are the broad valley nature of the landform which is defined by a sequence of connected ridges and the sloping landform approximately in the centre of this area. Outside of the proposed quarry expansion are Kaarearea paa and elevated hill sides to the north east. Kaarearea paa, while not identified as an ONL or ONF or more elevated than the ridges in the immediate backdrop, is a locally distinctive volcanic landform (and pā site), that rises above the existing quarry activities to a height of approximately 215mRL. The feature is broadly defined by the extent of indigenous vegetation which sits atop. The nearby ONL, beyond the proposed quarry expansion is also considered an important attribute to consider due to its sequence of rolling ridges, stream corridors and native forest. The vegetated areas of the Site are also considered to hold particular value, most notably the identified SEA areas within the Site.

Streams and wetlands exist within the Site and demonstrate varying conditions and qualities. For example, many of the streams and wetlands are dominated by exotic vegetation species. However, as natural waterways, all are considered to hold value due to their interplay of physical, associative and perceptual attributes.

While it is acknowledged that portions of the Landholding are indeed part of a significant, working aggregate quarry, and further the underlying zoning indicates that the characteristics of the area will change, the perceptual values are also considered to be influenced by the existing pastoral landscape in the Site which is associated with farming and animal production. Areas of indigenous vegetation within the Site which feature regenerating forest and stream corridors contribute to a heightened sense of natural qualities. In relation to the farmed / grazed areas, perceptual values are influenced by cyclical change through the seasonal colour of vegetation

(including pasture during the drier months), in addition to the presence of young animals such as calves and lambs. This perception of a productive landscape is also experienced through the presence of rural farming machinery and associated activities.

The associative values are the intangible things that influence how places are perceived. Notably, this is considered to include (but not limited to) the cultural history of the Site and its wider context including Kaarearea paa, considered to have high cultural landscape values. Associative values also include the values that the local community will likely hold for this landscape, that of a working rural landscape on the fringes of developed lifestyle areas and a working quarry.

5.0 The Project

The description of the Project is covered in more detail in the Assessment of Environmental Effects (AEE) report. In summary, the Project involves a new quarry pit and associated facilities to extend the life of the existing Drury quarry operation.

The applicant's Drury Quarry is located in Drury, within the Auckland Region, and has been in operation for over 80 years. Drury Quarry is a greywacke hard rock quarry supplying concrete, asphalt and roading aggregate to the Auckland market. The Drury Quarry pit is located within the wider Property owned by SAL which encompasses an area of approximately 562ha. This Property includes quarry activities, a clean fill, farmland and large swathes of native vegetation.

Based on current demand estimates, the existing pit will provide approximately 20 more years of aggregate supply to Auckland. To continue to provide a local supply of aggregate resource SAL proposes to develop a new pit within the existing site, called the "Sutton Block". The Sutton Block pit has been designed to provide approximately 240 million tonnes of additional aggregate to supply the market.

The Sutton Block is located to the northeast of the existing pit. The development of the Sutton Block will involve the staged development of an area of approximately 108 ha to a maximum pit depth of approximately RL -60 m. The overall site layout, including staging plans, is shown in Appendix C attached to the AEE report (a sample of which are in Plate 2 to 6 below). The Sutton Block is designed to be a separate quarry pit although it will be serviced by the existing Drury Quarry ancillary site infrastructure and facilities. These include the FOH activities such as the weigh bridge, processing plant(s), storage bins and stockpile area, the lamella, staff facilities etc.

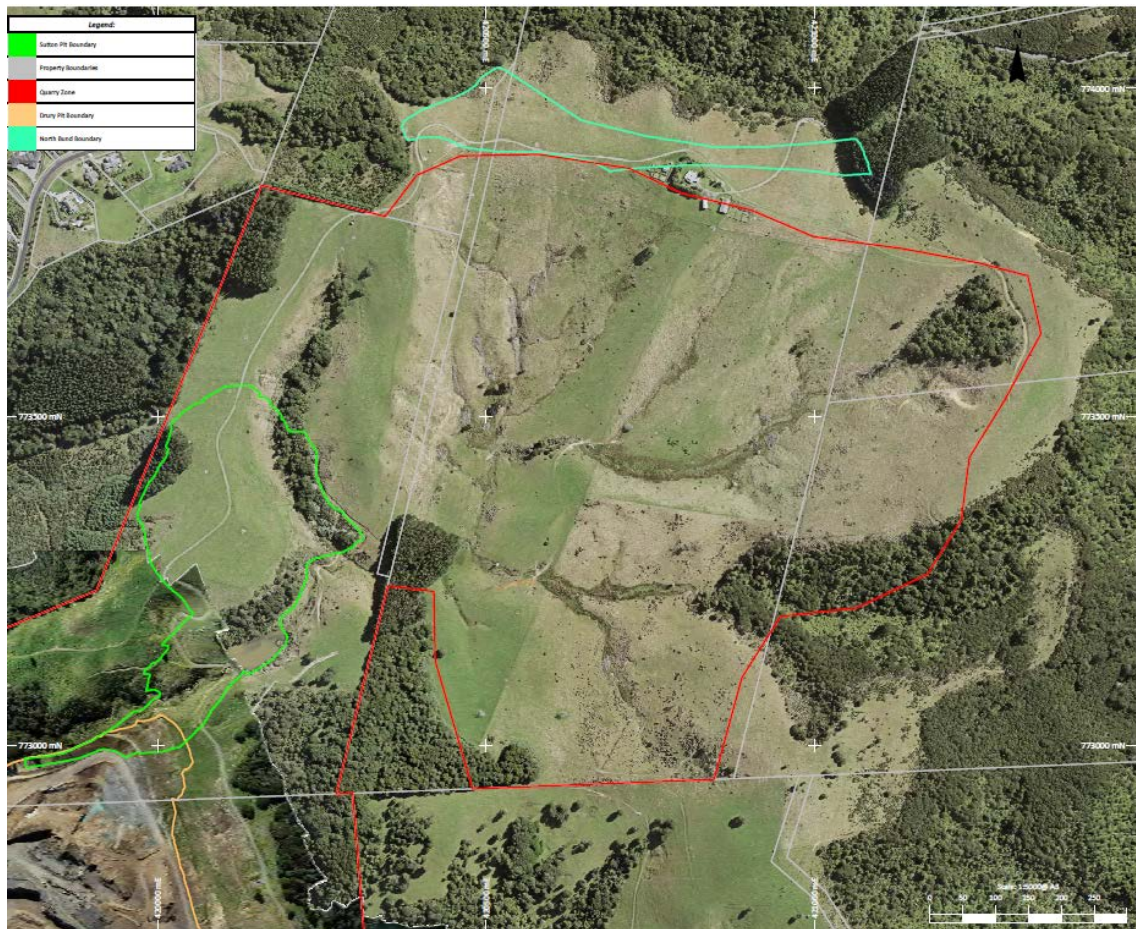
It is anticipated that as the existing Drury Quarry pit nears the end of its life and reduces aggregate extraction, the Sutton Block pit will increase its aggregate extraction. This will ensure a continuous aggregate supply to the market.

To enable the development of the Sutton Block, and support the extraction of aggregate, the project will also include the construction of road infrastructure to establish haul road access, overburden removal, stockpiles including bunding; stormwater ponds and supporting infrastructure, and construction of a conveyor belt connecting the Sutton Block pit to the existing Drury Quarry Front of House ('FOH') area. The works will also require stream diversions, stream reclamation, wetland reclamation, vegetation removal and mitigation offset. The Sutton Block will generally be developed in the following five stages. While the timing of these stages is

indicative and may vary over the life of the quarry, the stages provide a useful tool for assessment purposes.

Stage 1 – Infrastructure establishment (three-year plan)

The initial stage of work (Years 1 -3) involves the construction of the roading infrastructure required to access the site, draining of the existing farm dam to establish a sediment retention pond, associated stream diversion, initial offset planting, commencement of overburden removal, stockpiles (including bunding), and establishment of the conveyor system. Plate 2 below shows the extent of Stage 1.



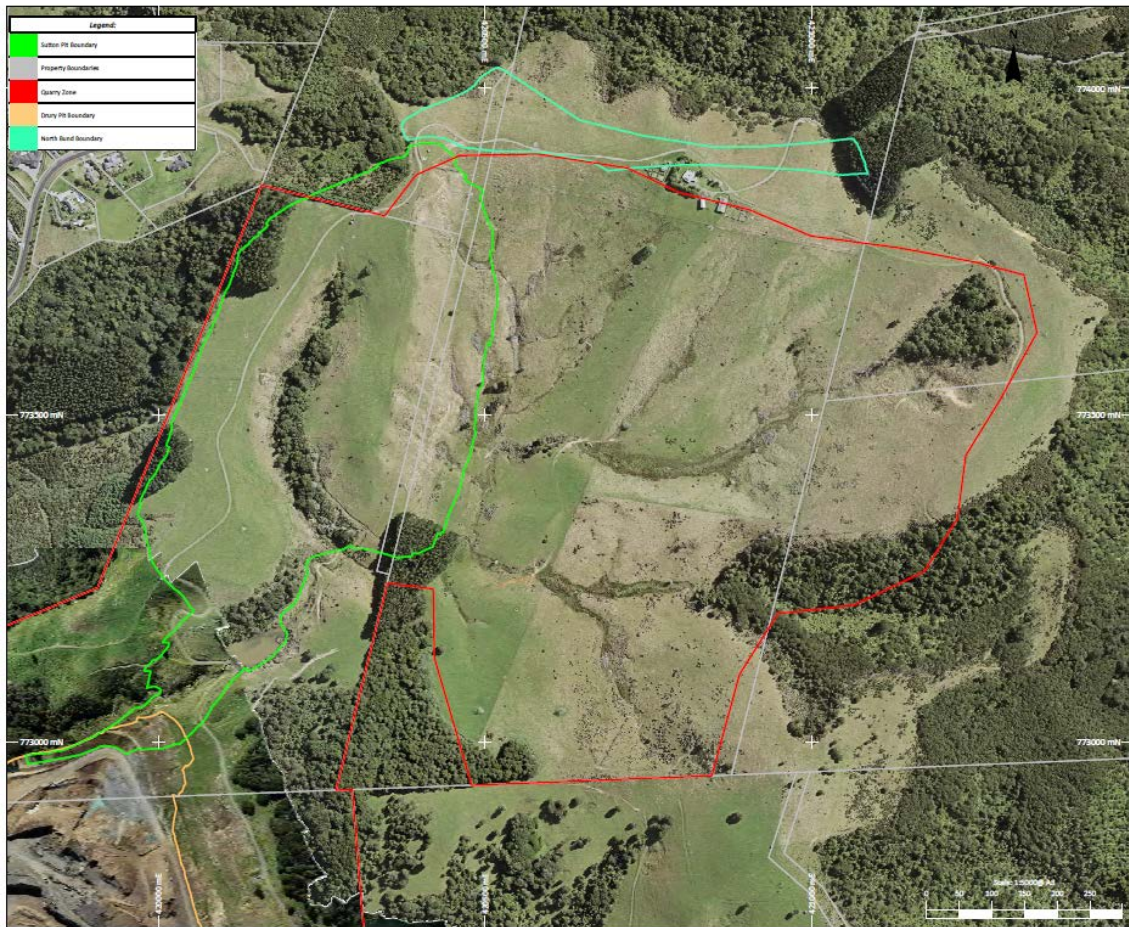


Plate 3: Stage 2, Year 15 Plan. Source: Terra Mining Consultants Drawing SSQ_24_402

Stage 3 – Operating Quarry (30 year plan)

The third stage of works is further expansion of the interim pit boundary (refer to Plate 4 below). Like Stage 2, the direction of the expansion will depend on market demand. However, in indicative staging plan shows the expansion of the pit to the east. During this stage of the works, the expansion of the pit will be incremental, widening and deepening as resource is extracted. Internal pit roads will be constructed as the pit expands.

The works involved in Stage 3 will generally include the same activities as Stage 2.

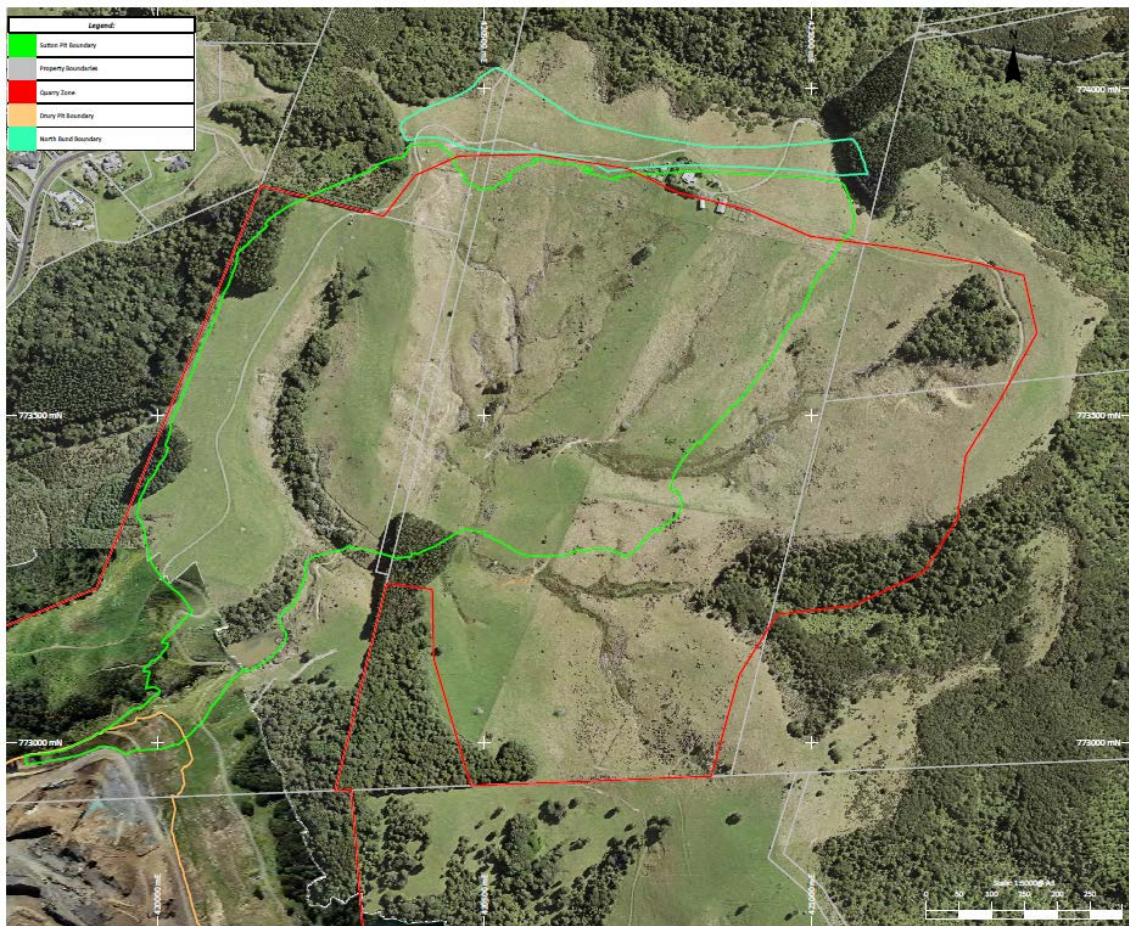


Plate 4: Stage 3, Year 30 Plan. Source: Terra Mining Consultants Drawing SSQ_24_403

Stage 4 – Operating Quarry (40 year plan)

The fourth stage of works is a further expansion of the interim pit boundary (refer to Plate 5 below). Like Stage 3, the direction of the expansion will depend on market demand. However, an indicative staging plan shows the expansion of the pit to the east. During this stage of the works, the expansion of the pit will be incremental, widening and deepening as resource is extracted. Internal pit roads will be constructed as the pit expands.

The works involved in Stage 4 will generally include the same activities as Stage 3.

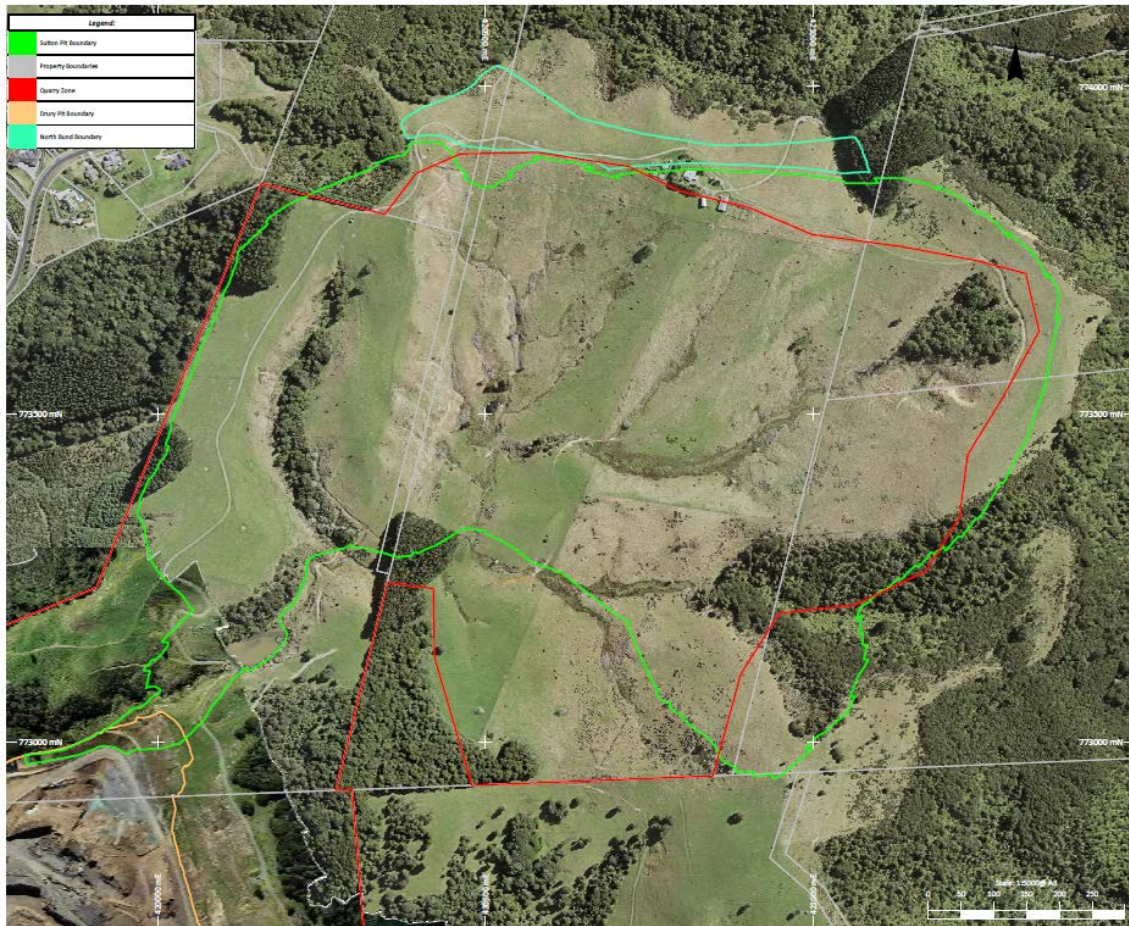


Plate 5: Stage 4, Year 50. Source: Terra Mining Consultants Drawing SSQ_24_404

Stage 5 – Life of Quarry Plan (50 year plan)

The fifth stage reflects the full extent of the quarry pit over an approximate 50-year period (refer to Plate 6 below). As with Stage 4, expansion of the pit will be incremental, deepening and widening as resource is extracted. The indicative staging plans show the pit expanding to the north and east. During this stage, the temporary northern bund will be removed. Internal pit roads will be constructed as the pit expands.

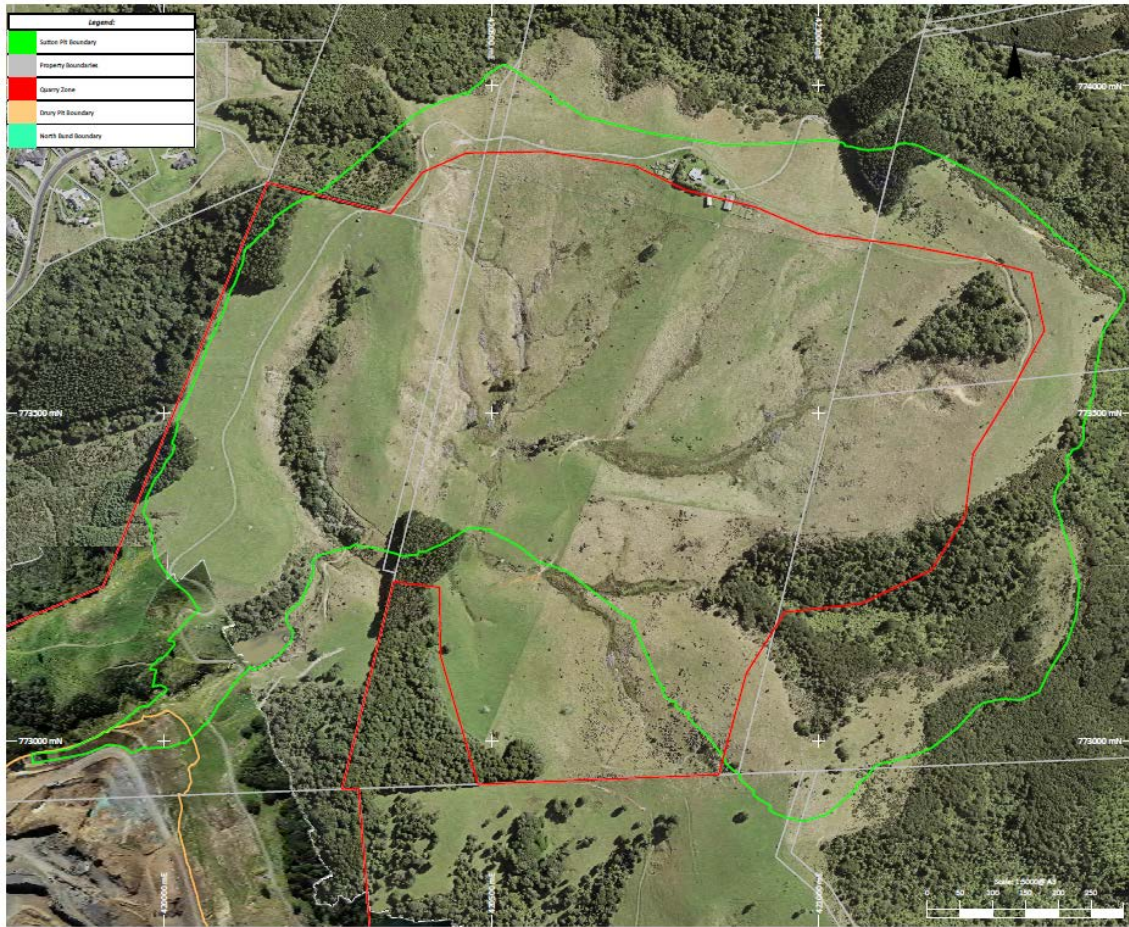


Plate 6: Stage 5, Year 50. Source: Terra Mining Consultants Drawing SSQ_24_405

A number of mitigation measures, particularly planting will take place which will be established as part of the Project. This includes utilising a combination of indigenous and exotic plant species. Exotic species are proposed due to their fast growth rates and therefore their ability to screen views in shorter timeframes. Where exotic species are proposed, these will be limited to one or two rows only and supplemented with eco-sourced native trees. It is envisaged that exotic trees could be removed in time once the native trees provide sufficient screening. These areas of planting are illustrated on **Figure 17, Appendix 3**, and will be further developed and detailed through a Landscape and Visual Mitigation and Management Plan (LV MMP) forming part of the conditions of consent. These mitigation measures have therefore been considered in evaluating the level of effects associated with the Project.

Screening of Quarry from the Local Vicinity

- To reduce the visibility of the Project from locations along Macwhinney Drive, it is proposed that the existing remnant pine trees that occur along the western extent of the final quarry pit are removed as the pine trees are considered over mature, do not provide sufficient screening and are at risk of falling down during the life of the quarry, thereby increasing views toward the Project. Upon granting of consent, it is proposed that these pines are removed prior to the implementation of the project to allow for the establishment of a 15m wide planting buffer. To enable prompt visual screening, it is proposed that a suitable exotic tree species mix is used such as Eucalyptus spp and Evergreen Alder (*Alnus jorullensis*) and Mexican cypress (*Cupressus lusitanica*). Mexican cypress already exists in the vicinity

of the pit rim (north western and south western portions). Native species are also proposed within the western portion of the 15m wide planting buffer as part of the ecological mitigation.

- To reduce visibility of the quarry from locations along Sonja Drive and to assist with overburden disposal, a bund is proposed in the northern portion of the Site. This bund would be progressively formed during Stage 1 (3 years) before being removed during the later portions of Stage 5 (between 40 and 50 years).
- To reduce views towards the portions of the quarry revealed following the bund removal, it is proposed that a suitable exotic tree species mix is used such as *Eucalyptus* spp. and *Alnus jorullensis* (Evergreen Alder). This is to be established between the northern toe of the bund and the neighbouring ONL. Puriri trees established within the portion of the ONL in the early stages of the Project would supplement this exotic vegetation planting.
- Acknowledging that the eastern ridge will be lowered during Stage 5, and noting that views of the quarry could be slightly increased for those viewing audiences to the north, south and west, it is recommended that a range of indigenous trees of some scale are interplanted near the crest of the newly formed ridge (proximate to the pit edge). It is suggested that Rewarewa, Rimu and Totara are selected for this purpose.

Indigenous Vegetation

- The Project will require the removal of approximately 16.78ha of native vegetation. This consists of 7.33 ha of Broadleaved podocarp forest, 8.8 ha of kānuka scrub/forest and 0.65 ha of rock forest.
- A number of revegetation opportunities are present within the Site and include areas to the south east and west of the proposed quarry expansion footprint. In total, approximately 62ha of replacement indigenous planting is proposed to mitigate the removal of vegetation as part of the Project to assist in mitigating natural character and landscape effects.

Lighting

- Lighting throughout the Project will be minimised as far as practicable so it meets the permitted standards of the zone(s). Placement and direction of lights should avoid high points which are visible outside of the Site. Light shields should be used where necessary, and all lightings shall be down facing to minimise effects on the night sky.

6.0 Visual Catchment and Viewing Audiences

6.1 Viewing Audiences

Refer to Figures 8 to 16 Appendix 3

To determine the visual catchment and viewing audience of the Project, a study of aerial photography including land use, landform (contours) and vegetation patterns in addition to a series of Zone of Theoretical Visibility (ZTV) analyses were undertaken. Site visits then followed to ground truth and identify potential viewing audiences and to obtain representative photo viewpoints to assist in determining the likely level and nature of change. Representative views have been obtained from the nearest available public locations where views could be captured.

In considering the visual catchment of the Site, due to the topographical characteristics of the Landholding and area, the visual catchment to the east will be influenced by the rising bush clad topography in the context of the Site, notably a broad ridge which is positioned at a midpoint between Peach Hill Road and the proposed Quarry extent. Therefore, the predominant areas that the Project will be visible from are largely to the north, south and west. The viewing audiences of the Project in a number of cases will be existing viewing audiences of the current Drury quarry activities. Other viewing audiences, particularly to the west (e.g. Macwhinney Drive) and some viewing audiences to the north along Sonja Drive would observe a quarry activity which does not currently form part of their views.

With the above considered, the viewing audiences of the Site have been identified and categorised into the following geographical groups.

Viewing Audience Group 1:

- Residents and road users along Macwhinney Drive, west of the Site. In particular this includes those in the upper (northern) portion of the road³¹.

Viewing Audience Group 2:

- Current and future light industrial works and road users along the southern end of Fitzgerald Road and residents and road users along the northern end in addition to Fieldling Road and Cossey Road, south west of the Site.

Viewing Audience Group 3:

- Road users and future industrial workers along Quarry Road, Jack Stevenson Road, Bill Stevenson Drive and Maketu Road.
- Viewing audiences between SH1 and Maketu Road as well as John Main Drive (and associated residential development) to the south west of the Site.

Viewing Audience Group 4:

- Residents and road users along low elevation western portions of Ararimu Road in the vicinity of Ramarama school.
- Visitors (including pupils and staff) to Ramarama school.

Viewing Audience Group 5:

- Residents along Peach Hill Road³² and road users in the vicinity of these properties.

Viewing Audience Group 6:

- Residents along elevated north facing slopes of Pratts Road, Otto Road, Ararimu Road, Hiwinui Road, Fausett Road and the elevated portions of Maxted Road.

Viewing Audience Group 7:

- Road users along SH1.
- Residents and road users west of SH1 in the predominately lowland agricultural areas (e.g. Great South Road).

³¹ In particular, 230, 284, 288, 291, 300, 310, 336, 337, 347, 350, 354, 358, 539 and 369 Macwhinney Road.

³² Particularly those at 84, 86, 96 in the western portion of Peach Hill Road. Residents at 418, 426, 435, 438, 439, 442, 442B, 444, 444A, 444C in the north eastern portion of Peach Hill Road have also been considered due to the proximate position to the Project.

Viewing Audience Group 8:

- Residents and road users along Sonja Drive, Laurie Drive and Ponga Road to the north of the site.

A range of viewpoints representing the key viewing audiences listed above have been selected and are illustrated on **Figure 16**, with photography provided in **Appendix 3**. Visual simulations from selected locations are illustrated in **Appendix 4**.

Table 3: Visual Assessment Viewpoints

VP No.	Viewing Audience Group No.	Location	Direction of View	Viewpoint Distance to Applicant Landholding and project element (Approx.)	Reason for Selection
1	Group 1	Macwhinney Drive 1 of 2	East	150m to Landholding 165m to Final Quarry Pit	Representative of viewing audiences along, particularly nearby residents.
2	Group 1	Macwhinney Drive 2 of 2	South East	60m to Landholding 300m to Final Quarry Pit	Representative of viewing audiences along, particularly nearby residents.
3	Group 2	Fitzgerald Road	East	350m to Landholding 1140m to Final Quarry Pit	Representative of viewing audiences along Fitzgerald Road, particularly nearby (future) workers in light industry land.
4	Group 3	Maketu Road	North-East	820m to Landholding 1800m to Final Quarry Pit	Representative of viewing audiences along Maketu Road, particularly nearby (future) workers in light industry land.
5	Group 3	John Main Drive	North-East	850m to Landholding 2190m to Final Quarry Pit	Representative of viewing audiences along John Main Drive, particularly newly established residential viewing audiences.
6	Group 4	Ararimu Road 1 of 2	North-East	1010m to Landholding 2470m to Final Quarry Pit	Representative of viewing audiences along Ararimu Road, particularly those associated with Ramarama School.
7	Group 5	Peach Hill Road	North	1m to Landholding 1600m to Final Quarry Pit	Representative of viewing audiences along Peach Hill Road, particularly residents in elevated location near viewpoint vicinity.
8	Group 6	Ararimu Road	North-West	2430m to Landholding	Representative of viewing audiences along Ararimu Road

		2 of 2		3260m to Final Quarry Pit	and Hiwinui, particularly residents in elevated locations.
9	Group 7	Great South Road 1 of 2	North-East	2520m to Landholding 3980m to Final Quarry Pit	Representative of viewing audiences along Great South Road, particularly residents in local vicinity and those traveling along SH1 to the west.
10	Group 7	Great South Road 2 of 2	East	2040m to Landholding 3030m to Final Quarry Pit	Representative of viewing audiences along Great South Road, particularly residents in local vicinity
11	Group 8	Sonja Drive	South	250m to Landholding 730m to Final Quarry Pit 730m to Bund	Representative of residents along Sonja Drive
12	Group 8	Laurie Drive	South-West	210m to Landholding 700m to Final Quarry Pit 820m to Bund	Representative of residents along Laurie Drive and Resident at 1109 Ponga Road
13	Group 7	State Highway 1	North	3680m to Landholding 5400m to Final Quarry Pit	Representative of those travelling north along SH1 to the south.
14	Group 5	Peach Hill Road	East	630m to Landholding 1080m to Final Quarry Pit	Representative of residents along the northern portion of Peach Hill Road.
15	Group 6	Otto Road	North	1290m to Landholding 2200m to Final Quarry Pit	Representative of residents along Otto Road.
16	Group 6	Pratt Road	North	1900m to Landholding 2800m to Final Quarry Pit	Representative of residents along Pratt Road.

7.0 Assessment of Effects

The effects covered in this assessment include those that can occur in relation to changes to landscape attributes and values, character and visual amenity (i.e. viewing audiences and their

outlook), in addition to natural character effects in relation to the waterbodies that occur within the Site. The effects described in this assessment are considered with the proposed mitigation measures implemented.

Natural character, landscape and visual effects can result from change in the components, character or quality of the landscape values. Usually these are the result of landform or vegetation modification or the introduction of new structures, facilities or activities. All these impacts are assessed to determine their effects on landscape character and quality, amenity and on public and private views. In this report, the assessment of potential effects is based on a combination of the landscape's sensitivity and visibility, and the nature and scale of the Project in relation to the existing characteristics of the site.

In relation to this Project and our methodology (**Appendix 1**), it is considered that the degree to which landscape and visual effects are generated by a development depends on a number of factors. These include:

- The degree to which the Project contrasts, or is consistent, with the qualities of the surrounding landscape.
- The proportion of the Project that is visible, determined by the observer's position relative to the objects viewed.
- The distance and foreground context within which the Project is viewed.
- The area or extent of visual catchment from which the Project is visible.
- The number of viewers, their location and situation (static or moving) in relation to the view.
- The backdrop and context within which the Project is viewed.
- The predictable and likely known future character of the locality.
- The anticipated outcomes sought in the statutory provisions, including zoning.
- The quality of the resultant landscape, its aesthetic values and contribution to the wider landscape character to the area.

Change in a landscape does not, of itself, necessarily constitute an adverse landscape or visual effect. Landscape is dynamic and is constantly changing over time in both subtle and more dramatic transformational ways, these changes are both natural and human induced. What is important in managing landscape change is that substantial and / or inappropriate adverse effects are avoided or sufficiently mitigated to ameliorate the effects of the change in land use.

7.1 Natural Character Effects

As described in **Section 4.4** of this assessment, the areas considered under the assessment of natural character relate to the identified streams, wetlands and associated margins of the Site. A total of nine un-named streams and thirteen wetlands have been identified by the Project ecologists. **Section 4.4** of this report describes characteristics and qualities that contribute to natural character, including both the biophysical and experiential attributes.

The Project will progressively impact the identified streams and wetlands which are located within the proposed final pit extent. These impacts will broadly begin in the western portion of the site, moving east as aggregate is extracted. Streams and wetlands will tend to be reclaimed (removed), totalling 3,341m of stream length removal and 18,758m² (1.88ha) of wetland removal across the life of the project which is anticipated to be 50 years. A stream diversion will occur,

affecting the lower portions of Stream 4. Offsetting and compensation will occur to manage effects on the streams and wetlands and will be provided to the east of the existing quarry (Peach Hill site), along a stream adjacent to Davies Road and at the Tuakau farm site³³. Some biophysical attributes may be in part returned through planting along the retained stream length along with the diverted stream channel. Moreover, localised experiential levels of natural character may be attained through the presence of moving water and associated hydrologic functions. However, these are unlikely to meaningfully influence the natural character characteristics and qualities within the diverted (and man-made) sections of the streams.

Because of the above substantial change, the streams and wetlands within the footprint of the quarry will not exist. Whilst the change may be high, the existing natural character condition must be considered in order to determine the level of effect. Further consideration has also been given in relation to the underlying zoning where these streams and wetlands are located. Specifically, it is considered that the Special Purpose Zone (Quarry) which sits across much of the area indicates an anticipated outcome on the site (a quarry) and provides some weighting to what is considered to be required to be protected.

Natural Character Effects on Streams

Streams 1, 2 and 2b have the highest degrees of natural character. Stream 1 and 2b and the upper and mid portions of Stream 2 will effectively be removed as part of the Project and this will remove its natural characteristics and qualities. In considering the effects for Stream 1, 2b and the upper and middle portions of Stream 2, these are considered **Moderate-High** as although not 'pristine' natural character environments, both support elevated biophysical and experiential degrees of natural character. Much of the length of these streams are however within the special purpose – quarry zone, with the exception of the upper portion of Stream 2 which is within the Mixed Rural Zone. With the underlying characteristics of the zone's future environment, together with offsetting and compensation (within and beyond the site) adverse effects are anticipated to reduce to **Low** for Stream 1, 2b and the mid portion of 2 and **Moderate** for the upper portion of 2.

Streams 1b, 7 and 9 have a lower degree of natural character due to the current condition. The Project will result in the removal of these streams in their entirety and adverse natural character effects are considered **Low**. With the underlying Special Purpose Quarry zoning affecting Streams 1b and 7, together with offsetting and compensation measures, effects are considered to be **Very Low**.

Streams 4, 5 and 6 have moderate degrees of natural character in considering their biophysical-active bed attributes. They also contain moderate or moderate-low experiential degrees of natural character. The biophysical – margins however have lower degrees of natural character due to pasture and other exotic species existing. The lower portion of Stream 4 will be diverted and Streams 5 and 6 will be removed in their entirety. It is considered that the effects on natural character will be **Low-Moderate**. Taking the Special Purpose – Quarry zone in to account, which defines the anticipated future characteristics of this area, together with proposed offsetting and compensation, these effects are considered to reduce to **Very Low**.

Natural Character Effects on Wetlands

In relation to wetlands, there will be no direct effects to Wetland 3 or 8. Furthermore Wetland 2a south and 2b will be retained. The remaining wetlands (Wetland 1a, 1b, 1c, 2a north, 6, 6a, 6b, 6c, 6d, 7a, 7b and 9) will be removed. As expressed, these will be progressively removed as the quarry is expanded. Wetland 2a north is considered to have the highest degree of natural character in both the biophysical attributes (considered Moderate) and experiential attributes (considered Moderate-Low). The removal of this wetland will result in **Moderate** natural

³³ 86 Friedlander Road, Tuakau

character effects. Whilst Raupō Reedland exists, the only other vegetation type comprises of exotic species. The wetland is degraded through the associated land use it is with (pastoral farming) and is highly modified from its original vegetation. Offsetting and compensation will mean that effects are managed through restoring other wetland features and in considering this alongside the underlying zoning (special purpose – quarry), adverse effects are considered to be **Very Low**.

The remaining affected wetlands are considered to have reduced degrees of natural character (considered Moderate-Low for biophysical and Low for Experiential). Whilst defined as 'natural wetlands', providing hydrological functions, these wetlands are primarily made up of exotic species and of low quality habitats. Their degraded condition and context within pastoral farming has reduced their degree of natural character. With the above in mind, it is considered the adverse effects on the natural character characteristics and qualities will be **Low-Moderate**. With offsetting, compensation and the underlying zoning further considered, adverse effects are anticipated to be **Very Low** for these remaining wetlands.

7.2 Landscape Effects

7.2.1 Effects on Landscape Characteristics, Attributes and Values

In terms of land use, this will inherently change from a primarily grazed pastoral farming landscape with indigenous areas of bush, to a quarry land use. This changes the landscapes combination of physical, associative and perceptual attributes. Accepting that change will take place, the change will occur in the context of an existing quarry landscape in which the area of the Project is linked both physically and visually by the northern portion of the existing quarry, meeting the extent of the proposed quarry pit. Therefore, such activities occur adjacent to or in the context of the Site. What this means is the associative and perceptual understanding of the Site is considered in the context of the existing quarry activities. It is not a landscape isolated from the existing quarry, however it is recognised that the expansion, particularly beyond the northern and eastern ridges will mean the activity will impact a different landscape catchment more associated with attributes of greater value (e.g. SEA and ONL).

The AUP zoning of much of the broader Landholding is also zoned as Special Purpose – Quarry. Notwithstanding this, 28% of the full extent of the proposed quarry falls outside of this zone, and within the Mixed Rural Zone. However, the margins of these two zones does not relate to a change in landscape characteristics, although it is considered that both broad areas, remain influenced by the quarry activities in considering their associative and perceptual attributes. These areas tend to occur visually alongside the existing quarry and share similar characteristics to those areas that form the eastern backdrop of the existing quarry. Moreover, the planning instrument recognises the influence of quarries beyond the zoning through the establishment of the Quarry Buffer Zone. The combination of the physical, associative and perceptual attributes of the Site, in addition to the planned characteristics of the site are therefore considered and with the above in mind, the Project will result in **Moderate** adverse effects on the landscape characteristics.

In terms of topography, the Project will ultimately involve the removal of a substantial amount of material from the Site which will permanently alter the broad valley landform attributes from one defined by a sequence of connected ridges, with minor undulations towards the centre. Whilst a legible topographical feature, the 'bowl like' landform is not considered a noteworthy feature of

particular value, acknowledging that comparable valley landforms exist in the local context of the site. For example, another such landform is present south of the Site and defined by Pratts Road, Ararimu Road and Otto Road.

The removal of material within the extent of the quarry will be broadly influenced by the series of connected ridges that form the catchment of the valley, however ridges to the north and east will be lowered / removed as the quarry evolves, particularly through Stage 4 and 5. It is accepted that this will have a localised effect on these attributes, although these ridges will remain as such, albeit at a reduced, and modified level. Importantly, Kaarearea paa (within the landholding) will not be directly impacted by this Project, which is discussed further below. Additionally, Ōpaheke, a high point reaching approximately 329mRL to the northeast of the landholding will remain as a prominent landscape feature. Elevated ridges of comparable or greater scale will continue to surround the project to the north and east which will mean that whilst the ridges of the site will be modified, the sequence of ridges within the broader landscape will continue to express the undulating topographical characteristics of the hills which lead down to the lowlands towards the west.

In relation to the proposed bund, located to the north of the quarry pit, it is recommended the new landform is graded to tie into the surrounding contours for the duration of its existence (from Stage 1 to part way through Stage 5). From the north, the bund will appear as an extension of the rising landform which then drops in elevation towards the proposed quarry pit.

With the topographical values of the Site in mind, it is considered any adverse effects will be **Low-Moderate**.

The Project will avoid infringing on the ONL overlay which is located to the north of the proposed quarry pit, but in close proximity (at least 9.4m) from the overlay. (refer Plate 7 below). The area of the ONL that is most proximate, while forming part of the “hill country” qualities, it does not demonstrate or contribute to the “sequence of mature and regenerating native forest”.

“Peripheral pockets of pasture” are noted as an attribute of the ONL and an area of pasture exists immediately north of the proposed quarry pit. The ONL also includes peripheral pockets of pasture near land surrounding Ponga Road, Gillespie Road and Middleton Road. Indigenous planting is proposed in the pocket of pasture within the ONL as part of the ecological mitigation response. While it is acknowledged that pasture is noted as an attribute, it is considered that establishing indigenous vegetation within this area will overall, contribute to the natural attributes which underpin the outstanding qualities of this landscape.

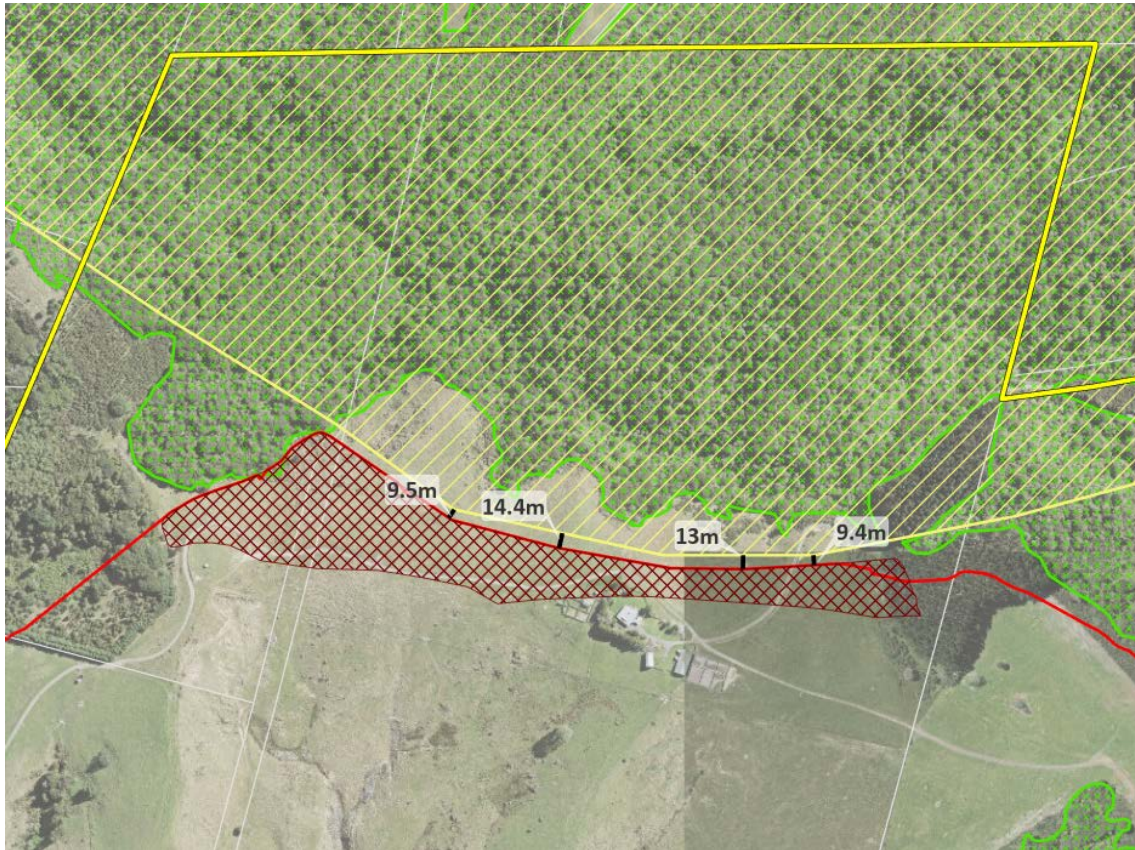


Plate 7: ONL overlay intersecting with the pocket of pasture and distance from the Stage 5 boundary in the northern portion of the site.

In relation to the Project's proximity to the ONL and any indirect effects that may occur, the ONL has been delineated in the vicinity of two established quarries, being both the Applicant's landholding and the nearby Symonds Hill Quarry (refer Plate 8 below).

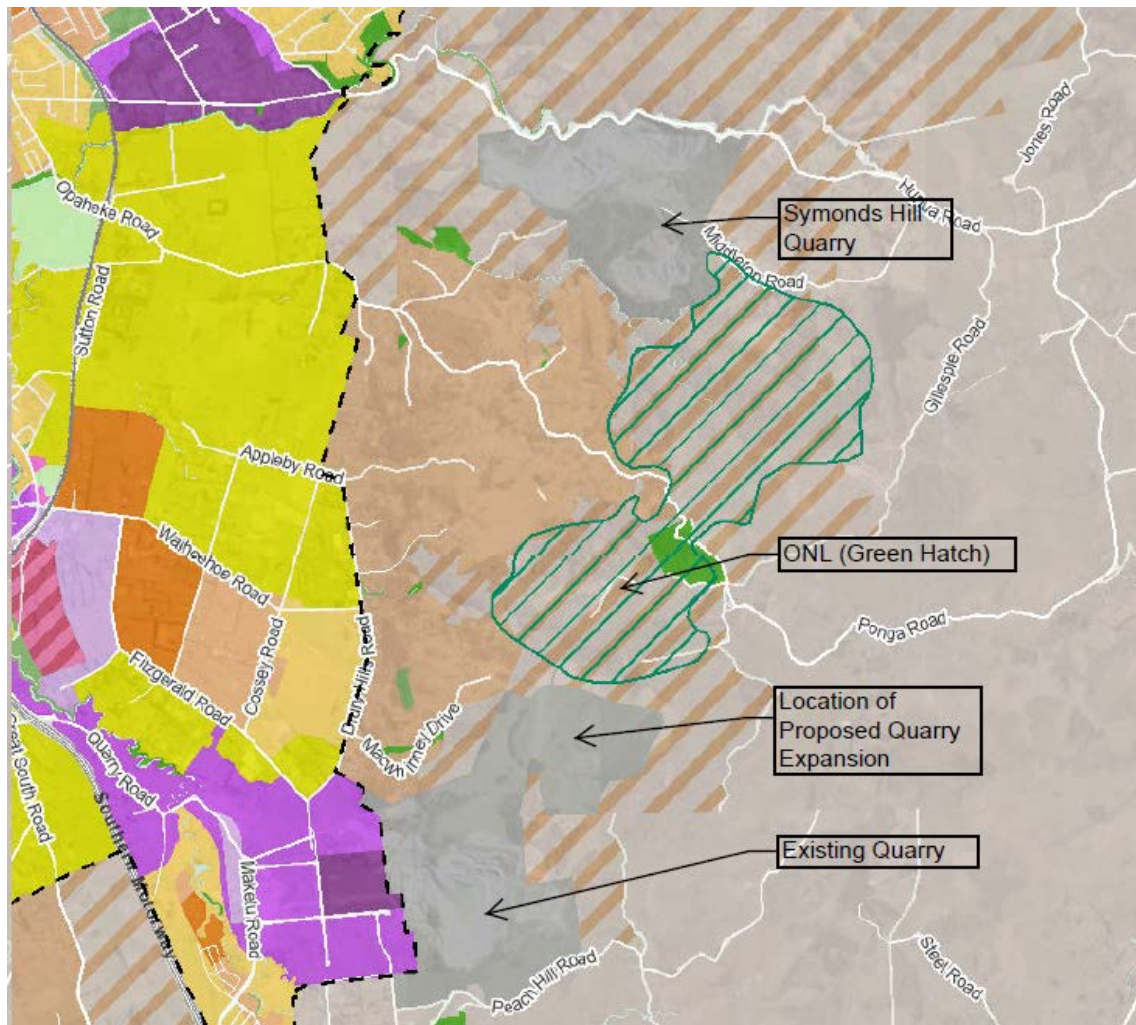


Plate 8: Ponga Road ONL in context of Applicant Quarry and Symonds Hill Quarry

These quarry activities form part of the local context of the landscape. Moreover, roading infrastructure and residential lifestyle properties also exist within the ONL and whilst the existing level of built form partly detracts from the natural qualities of the ONL, the combination of hill country, and regenerating native forest remains as a prominent attribute throughout. With this in mind, it is considered that the visual coherence and integrity of the ONL landscape will remain intact and any effects will be **Low** adverse.

In considering Kaarearea paa, it is recognised that it is both a culturally and ecologically significant feature. The Project avoids any direct impact on the Historic Heritage Extent of Place AUP overlay. Further, it is understood that the design of the Project, particularly the pit has been carefully considered to remain well set back from this feature. The southern extent of the proposed quarry pit has been pulled away from the overlay and broader Kaarearea paa landform which has essentially included relinquishing a large area of Special Purpose Quarry Zone (which is comparable to the Historic Heritage and Special Character Extent of Place overlay)³⁴ and will assist in reinforcing the landform. Further, in support of this, mitigation planting of indigenous species are proposed around the lower flanks of the landform which will further support the legibility of the existing planting and hill feature. Whilst the Project will introduce activities in the context of Kaarearea paa that will reduce its landscape value overall, it

³⁴ 693, Ballards Cone pa site R12_278

is recognised that the visual context of Kaarearea paa is anticipated to be characterised by quarry activities as per the Special Purpose - Quarry Zoning in the vicinity which directly adjoins Kaarearea paa to the north, south and west. With the above in mind, being the planned characteristics of the context of Kaarearea paa (i.e. quarrying), together with the proposed setback from the feature and mitigation planting around its flanks, it is considered adverse effects will be **Low- Moderate** overall.

In relation to the Site's streams and wetlands within the footprint of the pit extent, all will be impacted by the Project, principally because the proposed quarry expansion pit footprint is in the location of these features. The impacts will occur at different times through the life of the Project, and will ultimately include total reclamation of all streams, totalling 3,341m of Streams (permeant and intermittent). Streams 1, 2, 4 and 5 hold 'moderate ecological values'³⁵, with Stream 2B, 6 and 9 holding 'Low' ecological values, Stream 3 and Stream 7 holding Very-Low ecological value.

In considering the wetlands of the Site, again the Project will result in the removal of these landscape attributes, ecological habitat and landscape values from within the Project footprint. Wetland 1a and 2a north have the greatest ecological value (being 'moderate'³⁶). These are also the largest wetlands, with Wetland 2a north containing some areas of Raupō wetland. The other wetlands have an ecological value considered low. There will be no direct effects to Wetland 3 or 8. Furthermore Wetland 2a south and 2b will be retained although there would be a loss of catchment for these features.

The ecological condition (and values) of these streams and wetlands does in part (but not wholly) contribute to the physical, associative and perceptual values of these landscape attributes. The prevalence of exotic vegetation in many of these areas juxtaposing with the current landuse informs the qualities of these attributes, and where farming activities in addition to exotic vegetation are prevalent, it is considered these attributes and associative values are reduced. Perceptual values of these attributes are also influenced by these conditions, with the streams and wetlands considered to be part of the working farm landscape. Where ecological values are greater, the associative values and perceptual values are more elevated due to their landscape qualities (e.g. indigenous vegetation and intact stream corridor).

Change brought about by the Project will be gradual in that the works are proposed to be initially focused on the western portion of the Site (associated with Stage 1 and 2), with the final pit footprint being completed over a number of decades (with Stage 3,4 and 5 extending northeast).

The greatest effects on streams and wetlands will be where the associative and perceptual values are most related to the qualities of these features, these areas include portions of Stream 1,2,5 and Wetland 2a north where the Raupō wetland exists. In this case, it is considered that the natural qualities that underpin these associative and perceptual aspects are of a greater 'value' than associative and perceptual values associated with areas influenced by farming activities. Effects cannot be fully mitigated on site, noting that some offsetting is occurring west of the existing quarry across 3 intermittent tributaries and to the stream adjacent to Davies Road which is an unnamed tributary of the Maketu Stream (which ultimately drains to the Hingaia Stream north west of the existing quarry). The remaining offsetting will occur on two alternative sites identified as "Drury Islands" and 'Tuakau Farm Site'.³⁷ Here enhancement and restoration planting will occur including stream riparian planting (totalling 5.38 ha) and wetland planting (4.04ha). It is considered that overall, and in combination with the underlying special

³⁵ Assessment of Ecological Effects, Bioresearches

³⁶ Assessment of Ecological Effects, Bioresearches

³⁷ 86 Friedlander Road, Tuakau

purpose quarry zoning which occurs across much of these areas, adverse effects on these features will be **Low-Moderate**.

The remaining streams and wetlands will result in effects considered to be **Low** due to their predominantly exotic species, occasional stream crossings (culverts), and current biophysical, associative and perceptual values.

In considering effects on vegetation, a large portion of the proposed quarry expansion will occur in areas of exotic pasture which occupy much of the Site. It is not considered that these areas of pasture hold high landscape values due to the vegetation being both exotic and common. A further 5.25 ha of exotic vegetation comprising gorse, weeds, cypress and pine plantation will also be removed within the footprint. To aid in visual screening a further area of over mature exotic pine will be removed along the western interface of the final quarry footprint before being replanted with more suitable species. It is not considered this exotic vegetation holds high landscape values in this context, being exotic, of common stock and including invasive species.

The quarry expansion will require the removal of approximately 16.78ha of indigenous (and SEA), vegetation which will result in adverse effects on the landscape attributes and values of the Site. This includes removal of 7.33ha of Broadleaved podocarp forest, 8.8ha Kānuka scrub / forest and 0.65ha of rock forest. Indigenous vegetation is proposed through revegetation planting as summarised in **Section 5.1** and further detailed in the Biodiversity Offset and Compensation Plan prepared by BioResearches. The revegetation and enhancement actions would be undertaken over five stages to either coincide with, or in advance of expected vegetation removal. In summary, approximately 62ha revegetation will be achieved. Broadleaf podocarp forest revegetation will occur to the west of the proposed quarry pit, in areas of land where exotic vegetation including Pine and Privet. To the south of the proposed quarry pit, another area of broadleaf podocarp forest revegetation is proposed which will occur on west facing slopes above the existing quarry (i.e. east of the existing quarry). This vegetation will support existing remnant pockets of vegetation occurring on these slopes. Kānuka forest revegetation is proposed in areas to the south of the proposed quarry pit. Lastly, of Rock forest revegetation will occur in two areas to the south of proposed quarry pit.

In addition to the above revegetation, a total area of approximately 108ha is proposed for enhancement³⁸. This includes broadleaf podocarp forest enhancement Kānuka forest enhancement and rock forest enhancement. With the above considered, it is acknowledged that much of the 16.78ha indigenous vegetation that will be removed is within the SEA overlays and these areas hold landscape value, particularly where they form part of the wider characteristics of the vegetated hillside slopes of the area. Revegetation (totalling approximately 62ha), and enhancement actions (totally over 108ha) will assist in managing effects on the indigenous vegetation qualities of the Landholding and once established adverse effects on indigenous vegetation will be **Low-Moderate**.

7.3 Visual Effects

Visual effects are effects on landscape values as experienced in views. The nature of a view depends on how it is perceived and the extent to which it is valued or not. It includes how the landscape in the view is understood, interpreted and what is associated with it.

The below assessment utilises the viewing audience groups identified in **Section 6.0** of this report to describe the type of viewing audiences, the composition of their view and the nature

³⁸ Enhancement of an appropriate quantum of existing BLP forest as determined by a Biodiversity offset Model that demonstrates at least a no-net-loss for flora and fauna habitat values, Assessment of Ecological Effects, BioResearches

and degree of visual effect in relation to the Project at four intervals, following the indicative assessment stages set out above.

The following assessment refers to the **Appendix 3** viewpoint photographs and **Appendix 4** Visual Simulations, to assist the understanding of where the Project on the Landholding in relation to the wider landscape context.

7.3.1 Viewing Audience Group 1

Figure References:

- *Appendix 3: Figure 16 and VP1 and VP2*
- *Appendix 4: Figure 1 and VS1*

Viewing Audiences:

- *Residents and road users along Macwhinney Drive in addition to visitors to Macwhinney Reserve*

Existing Views

This group of viewing audiences is defined by Macwhinney Drive, which originates from Drury Hills Road. Macwhinney Drive is located to the west of the Project and climbs from an approximate 50m contour to an approximate 200m contour. The land to the west falls away toward Drury Hills Road. The landform to the east of Macwhinney Drive also descends in elevation before steeply climbing again to a similar, or often higher level than the road corridor.

Residential properties occupy land on either side of the road corridor and are set within generous lots featuring landscaped grounds. A cluster of 9 properties sit at around the 180m to 195m contour and due to their elevated position and comparable elevation to the land towards the east, have the greatest ability to afford views of the surrounding landscape. Those on the western side of the road have their views focused towards the west (in the direction of Drury). Those on the eastern side of the road, whilst often orientated north, obtain their main outlook towards the south-east and east (towards the Site).

The publicly owned Macwhinney Reserve is also located along Macwhinney Drive and comprises of three areas. The northern most area is set back from the road (approximately 200m to the north) and is on a lower west facing slope when compared to the road corridor. The south eastern and south western areas are two linear pieces of land which follow the low point of a minor gully, situated between adjoining lots and bisected by Macwhinney Road.

In relation to this Project, the viewing audiences which obtain east facing views are most relevant. These are those recreational viewing audiences in the south eastern portion of Macwhinney Reserve, and those residents along the eastern side and upper portion of Macwhinney Drive. These views are characterised by the west facing slopes which interface these residential lots and the Landholding. These vegetated slopes are clad in a mix of exotic and native vegetation. Most notably, a combination of pine trees and other exotic species such as Mexican cypress and acacia exist within the Project's Site which provides a partial screen of the Site beyond.

The existing vegetation, in addition to landform characteristics contribute to filtering some views towards the Project site. Views that are obtained are currently provided between gaps in vegetation including the existing pines (mainly between the trunks of the trees) along the interface.

Proposed Views

During Stage 1 of the Project, it is anticipated that residential viewing audiences, road users and potentially some visitors to Macwhinney Reserve will be able to observe pine removal and planting of trees along the interface of the Site (as detailed in **Section 5.0**), in addition to vehicular movements along an established haul road, transporting material to the northern bund. Views of the vehicles will be at least 230m away, along the broad alignment of an existing farm track and within the Special Purpose - Quarry Zone. These vehicular activities will occur for approximately 1 year. With the above in mind, it is considered any effects during Stage 1 of the Project will be **Low** adverse.

During Stage 2, works will move northwards and be much closer to the viewing audiences along Macwhinney Drive. It is anticipated that the heights of the proposed exotic planting (which will have been established for at least 3 years) will filter views towards of the Project and be of a height that Project elements (e.g. vehicles) would not be discernible above this vegetation. It is anticipated that by 15 years (i.e. the end of the Stage 2 duration), the heights of the screen planting, particularly the eucalyptus will be over 15m. Native revegetation as part of the wider vegetation mitigation strategy will also continue to establish to the west of the proposed 15m wide band of vegetation and will provide a greater level of screening. It is therefore anticipated that views of works in relation to the proposed quarry will be filtered by the proposed screen planting. Moreover, the expression in the view of the landscape's biophysical values will be enhanced through further native planting. Acknowledging the zoning of the land where these works will be taking place, and with the above in mind any effects will be **Low** adverse.

As the Project progresses through Stage 3 (30 Years), Stage 4 (40 years) and Stage 5 (Life of Quarry), the vegetated screen will be fully established (i.e. mature). In relation to over-maturity or potential tree failure, it is recommended that as these trees are progressively replaced to ensure a permanent green screen and this would be detailed in the LVMMP. This will ensure that any views towards the Project remain obscured from residential properties along Macwhinney Drive. Indigenous vegetation established as part of the native revegetation mitigation strategy will now also be fully established and in part provide screening, particularly for residents in lower portions of their properties that may look up towards the site in an eastern direction. With the above in mind, it is considered that provided an established vegetated screen remains, any effects overall will be **Very Low**.

7.3.2 Viewing Audience Group 2

Figure References:

- *Appendix 3: Figure 16 and VP3*

Viewing Audiences:

- *Future light industrial works and road users along the southern end of Fitzgerald Road and residents and road users along the northern end in addition to Fieldling Road and Cossey Road, west of the site*

Existing Views

Existing views at the southern end of Fitzgerald Road toward the direction of the Site is of a landscape which has undergone substantial modification and change as a result of quarrying activities and material removal. Scattered areas of recent revegetation planting exist across some portions of the landholding. Occasional areas of vegetation extending from the direction of Macwhinney Drive, to the left of the views are also visible, in addition to the distant slopes behind the existing quarry. In places, the existing quarry meets the visible ridge of the view,

notably the northern portion of the quarry. The vegetated upper portion of Kaarearea paa is also visible and maintains the highest landform feature in the view. Its mid to upper flanks then meet the existing ever changing quarry landscape featuring stripped soil and cut benches. The pine plantation and existing Mexican Cypress form a vegetated backdrop to the left of these views.

To the north along Fitzgerald Road, Fielding Road and Cossey Road the characteristics of the environment are rural, though consisting of a number of large green houses and other agricultural structures. Open fields are visually bisected by bands of trees and vegetation in the form of shelterbelts and wind breaks. Views towards the east are of a landscape which is increasing in elevation toward the Site. These views capture the west facing slopes of Macwhinney Drive. Views towards the Site are difficult to obtain because of the rising topography.

Proposed View

From southern locations along Fitzgerald Road, the change in view during all stages will be relatively limited. Stage 1 will bring about some distant pine removal and potentially, vehicles traversing the western haul road for approximately 1 year. Some earthworks may be visible in the southern most point of the site where elevated cuts are required west of Kaarearea paa. However, such change when considered alongside the existing composition of the view will be very limited and will result in no more than **Very Low** adverse effects. The future potential built environment is also important to consider, indeed built structures in line with the allocated light industrial zoning will bring large scale buildings within this context. Any viewing audiences, be it road users or further works at these premises will experience limited change.

As the Project progresses through Stage 2, Stage 3, Stage 4 and Stage 5 (Life of Quarry), the works will occur beyond the elevated landform featuring the western facing slopes east of Macwhinney Drive. These slopes will become more vegetated with indigenous species which will reinforce the underlying values of this peripheral landscape of the Project. The broadly pastoral covered slopes behind the existing quarry will be progressively established in vegetation and (Broadleaf Podocarp and Rock Forest revegetation). As time goes on, these areas of vegetation will become a more legible attribute in the view. From locations within the southern portion of Fitzgerald Drive it is considered any effects will be **Very Low**.

For those to the north of the light industrial zone along Fitzgerald Drive, Fielding Road and Cossey Road, it is not anticipated that any appreciable change will occur in these views due to the intervening topography between these viewing audiences and the Project.

7.3.3 Viewing Audience Group 3

Figure References:

- *Appendix 3: Figure 16 and VP4 and VP5*

Viewing Audiences:

- *Road users and future industrial workers along Quarry Road, Jack Stevenson Road, Bill Stevenson Drive, Maketu Road, in addition to viewing audiences between SH1 and Maketu Road as well as John Main Drive (and associated residential development) to the south west of the site*

Existing Views

From these low elevation locations to the west, existing views toward the Site are similar to that experience in Viewing Audiences Group 2. Views are of a highly modified landscape which is characterised by quarry, commercial and industrial activities, including a number of currently

vacant lots. Areas of legible vegetation exists particularly on the western slopes of the Landholding in addition to the rising landform feature of Kaarearea paa. The topographical features in the landscape are more modified than those beyond the extent of the quarry where minor ridges and gullies are present. Small fingers of vegetation are visible at the back of the existing quarry (east) and provide a softer interface with the visible ridges which meet the sky. Whilst existing views are important, it is considered the proposed industrial land uses that are currently taking shape influence the change proposed by the quarry expansion. Over the years the foreground of these views will change from largely vacant lots to large scale industrial buildings. These will likely screen large portions of these views as the Project develops.

Proposed Views

It is considered that the Project will not result in substantial change and views of the expanded quarry activity are anticipated to be limited. Existing topographical characteristics restrict views towards the site where the proposed quarry expansion will exist. Some areas of benching will be visible in the context of Ballads Cone in the western portion of the proposed quarry pit however such change is unlikely to be noticeable, or discernible for road users, future industrial workers and existing and proposed residents in the immediate vicinity. Progressive change to the Site's vegetation will also occur through pine removal and revegetation to the west of the site and areas to the south east which backdrop the existing quarry. Whilst these changes may occur, it is considered the adverse effects on values attached to these views for these viewing audiences will be limited. It is therefore considered that any change will be no more than **Very Low** adverse.

7.3.4 Viewing Audience Group 4

Figure References:

- *Appendix 3: Figure 16 and VP6*
- *Appendix 4: Figure 1 and VS6*

Viewing Audiences:

- *Residents and road users along low elevation north facing slopes of Ararimu Road (e.g. in vicinity of Ramarama school, visitors to Ramarama school)*

Existing View

Viewing audiences to the western end of Ararimu Road obtain low elevational views of the which is viewed across an area of rural land characteristics featuring pastoral fields, and shelterbelts, in the foreground and midground of the view. Transmission lines visually bisect the views of the rising landforms beyond which include the Site. The existing quarry is a prominent visual attribute, characterising the outlook, and is seen below the vegetated flanks of Kaarearea paa. Patches of remnant areas of pasture exist within the upper slopes and ridges in addition to the distant pines and vegetated west facing slopes of Macwhinney Drive.

Proposed View

During Stage 1, some change will be observed in relation to the removal of pine to the west of the Site, overburden removal and initial benching of the southern part of the proposed quarry pit. The north bund will be progressively formed during this time and western portions may be observed. This change however will be limited to a comparatively small area of the overall view and where change is observed, will be seen in the context of the existing quarry. It is considered that the values attached to these views are likely to be associated with Kaarearea paa and the

skyline, associated with a quarry landscape and such change, being visually limited and corresponding to these broad values is anticipated to result in **Very Low** adverse effects.

As the Project moves forward into Stage 2, the upper areas of cut in the north western portion will become more visible although it will likely read as an extension of the existing quarry pit. Isolated views of the upper portion of the northern bund may also be readable on the horizon of the view. Revegetation planting, particularly along the slopes to the east of the existing quarry will become more established and legible as a cohesive vegetated block and in places (such as outside of Ramarama School), will visually link to other prominent and elevated bush blocks. Notwithstanding this, and while recognising the revegetation of the slopes will contribute to amenity values, effects will increase to **Low** adverse.

During Stage 3, Stage 4 and Stage 5 (Life of Quarry) the views toward the Site from these locations will continue to change, most notably views of the upper portions of the quarry and particularly the eastern portion will become visible during Stage 4. During Stage 5 however, some of these more distant exposed quarry faces will drop below the retained ridge to the south of the quarry pit as the northern and eastern ridges are removed. The proposed revegetation to the south of the quarry (i.e. on the current pasture clad slopes east of the existing quarry), will by this stage be fully established, containing a range of mature native trees. Whilst changes to the ridges and views of exposed cut faces will detract from Kaarearea paa, the maturing native vegetation to the south of the quarry (which includes the flanks of Kaarearea paa), together with the vegetation along the slopes to the south of the quarry will assist to counterbalance the views of the most elevated cut faces of the quarry. This proposed vegetation will visually and physically link Kaarearea paa to this sequence of ridges. Exotic planting to the north of the northern bund – will also be revealed in Stage 5 of the Project (and whilst not native), will assist in stitching the sequence of ridges around the site and either side of Kaarearea paa from this viewing audience location. Therefore, with the acknowledgement that views towards the site are already dominated by the existing quarrying activities, and that the proposed planting throughout the site will contribute to connecting Kaarearea paa to the wider landscape, the greatest effects would be **Moderate** during Stage 4 (where cut faces are most visible), before reducing to **Low** in Stage 5.

7.3.5 Viewing Audience Group 5:

Figure References:

- *Appendix 3: Figure 16 and VP7 and VP14*
- *Appendix 4: Figure 1 and VS14*

Viewing Audiences:

- *Residents along Peach Hill Road³⁹ and road users in the vicinity of these properties*

Existing View

Viewing audiences along Peach Hill Road notably include residents and road users. Residents at 84, 86, 96 Peach Hill Road in particular are considered due to their elevated north facing views towards the Site. Existing views from these elevations consist of the sloping pastoral farming landscape in the foreground of views in addition to tree stands such as shelterbelts. Beyond these immediate attributes, the engineered overburden area to the south of the existing quarry is visible, with grass being progressively established. Fingers of vegetation are visible

³⁹ Particularly those at 84, 86, 96 in the western portion of Peach Hill Road. Residents at 418, 426, 435, 438, 439, 442, 442B, 444, 444A, 444C in the north eastern portion of Peach Hill Road have also been considered due to the proximate position to the Project.

along the west facing slopes to the east of the quarry. Kaarearea paa appears as a legible vegetated high point from this direction, and appears distinctive in that it is a vegetated, cone landform that contrasts with the pasture areas and foreground quarry activities. The existing quarry site appears as various exposed benches cut into the hillside slopes. In the background of the view the existing Pines which are positioned in the rising slope to the east of Macwhinney are visible. Distant vegetated hills are also attainable in the background of the view. Narrow areas of distant pastoral land is attainable either side of Kaarearea paa. To the left of the views, immediately beyond the quarry are the upper slopes where the initial stages of the Project will occur.

Viewing audiences along the northern portion of Peach Hill Road have also been considered. A broad cluster of lifestyle properties exist along this northern section of Peach Hill Road, on pasture lots and dwellings with a variety of aspects/orientations. A vegetated ridge to the west backdrops most western views towards the direction of the Site from these properties. Towards the south west, the ridge drops and reveals a more distant broad ridge which then also falls away before vistas towards the direction of Tuakau are afforded. This more distant ridge forms the back of the south eastern portion of the Project.

Proposed View

From those Peach Hill Road viewing audiences to the south of the existing quarry, aspects of the quarry will become visible. Stage 1 will result in a small change (when compared to the overall outlook), and this change will occur on pasture slopes just above the existing quarry in addition to the establishment of the northern bund in the distance. The benching into the slope as part of this Stage will be observed in the context/ backdropped by the existing quarry. The expansion will appear as an additional layer of quarry activities. The limited visibility and area of the northern bund means that from these locations, the effects will be **Low** as the legibility of the existing attributes and values people hold for these views, in addition to Kaarearea paa will principally remain.

During Stage 2, the visual change will remain limited due to the pit extents being behind the existing rising landforms of the Landholding. Substantial planting along the western facing slopes, east of the existing quarry will have become established providing a more vegetated outlook (rather than pasture), than observed at present. It is considered that from locations along Peach Hill Road, south of the quarry, effects will remain as **Low** as the integrity of Kaarearea paa will remain broadly intact, visibility of the quarry expansion will be largely obscured, and large areas of planting will be established and visible within the view.

As the Project progresses through Stage 3, Stage 4 and Stage 5 (Life of Quarry), it is considered unlikely that additional areas of quarry activity will be discernible for those to the south of the quarry along Peach Hill Road. Planting established east of Kaarearea paa, across a saddle, will assist in obscuring potential views of the upper portion of the quarry. With the above considered, it is established that the residual visual effects will be **Low** adverse.

For viewing audiences in the northern portion of Peach Hill Road, east of the Project, a ridge between the dwellings and the site will obscure views of the Project until Stage 5. At this point, viewing audiences would be able to observe the removal of a portion of a broader ridge which forms the back of the south eastern portion of the quarry. However, the removal of material in this location will not reveal the worked quarry benches as views will be looking at the back of the ridge and the quarry would occur beyond. Ecological planting within this south eastern area, just beyond the pit edge, together with existing vegetation retained and supplementary indigenous tree planting (Rewarewa, Totara and Rimu), will assist in visually softening abrupt edges created from the rim of the quarry pit. With the above in mind, it is considered there will be no effects on these viewing audiences until Stage 5, which would generate effects considered **Low** adverse.

7.3.6 Viewing Audience Group 6:

Figure References:

- *Appendix 3: Figure 16 and VP8 VP10 and VP16*
- *Appendix 4: Figure 1 and VS10 and VS16*

Viewing Audiences:

- *Residents along elevated north facing slopes of Pratts Road, Otto Road, Ararimu Road, Hiwinui Road, Fausett Road and the elevated portions of Maxted Road.*

Existing View

These viewing audiences relate to those who are situated in relatively distant locations to the south of the site. Those along Pratts Road, Otto Road, Fausett Road, Maxted Road and Ararimu Road will observe views of similar characteristics and qualities to that described in Viewing Audience Group 5, albeit at a greater distance from the site. These viewing audiences sit at around the 200mRL contour and therefore observe broadly elevated views towards the site. Importantly, this allows the partial views of the upper western slopes within the proposed quarry expansion, which is observed across the saddle between Kaarearea paa and the pasture covered slopes to the east. Those along the eastern portion of Ararimu Road (VP8) are unlikely to obtain views of the Project due to their more westerly orientation.

Proposed View

The change associated with Stage 1 will be limited from these locations due to the broad absence in views of the southern slopes of the proposed expansion. Those directly south of the existing quarry will have a slightly greater ability to obtain partial views of Stage 1 as it removes material from the east facing slopes. Distant partial views of material being deposited and shaped along the northern bund may also be obtainable. The limited visibility and area of the northern bund means that from these locations, the effects will be **Low** as the legibility of the existing attributes and values people hold for these views, in addition to Kaarearea paa will principally remain.

Up to Stage 2 there is the potential for views of the upper portions of the western side of the quarry to become visible for these viewing audiences. Revegetation planting along the eastern slopes, to the east of the existing quarry, in addition to planting along the saddle between Kaarearea paa and the pasture land will begin to contribute to softening the views towards the exposed quarry faces to the east of Kaarearea paa, however this vegetation would not screen views of the quarry faces. Further, works seen alongside the upper flanks of Kaarearea paa will be in contrast to the attributes and broad integrity of this feature and therefore effects on the values attached to these views will occur. It is at this juncture, effects will become more elevated, and for residents with fixed views, effects are likely to be up to **Low-Moderate** adverse.

As the Project evolves through Stage 3 and Stage 4, the aforementioned mitigation planting will continue to mature and grow in height although it is unlikely that vegetation on the saddle will be at a height to reduce partial views of the north western portion of quarry pit. It is not anticipated that further elements of the quarry activities will become visible due to the pit extent being positioned behind existing landforms during these stages. Therefore, with the above in mind, it is considered effects will remain as **Low-Moderate** adverse.

Stage 5 will signalise the lowering of the eastern ridge in these views. This will be a noticeable, but gradual change over about 10 years, following Stage 4. Whilst works will be beyond the ridge and unlikely to reveal working quarry faces, it is considered that this change will be

discernible. With the above in mind, it is considered effects will slightly increase through the modification (and lowering) of the eastern ridge), resulting in a **Moderate** adverse level.

7.3.7 Viewing Audience Group 7:

Figure References:

- *Appendix 3: Figures 16 and VP9, VP10 and VP13*
- *Appendix 4: Figure 1 and VS9*

Viewing Audiences:

- *Road users along SH1*
- *Residents and road users west of SH1 in the predominately lowland agricultural areas (e.g. Great South Road)*

Existing View

These viewing audiences obtain north east and east facing views toward the site which capture the established attributes of the quarry landscape characteristics. Exposed cut benches meet the surrounding areas of agricultural land, grassed bunds and vegetated hillsides. Kaarearea paa rises above the existing quarry and is observed as a distinctive natural feature in a modified landscape. Beyond the extents of the quarry, pasture slopes and Kaarearea paa, vegetated slopes exist containing exotics and indigenous vegetation. Most recognisable from these distances are the areas of pine nearby the site, to the east of Macwhinney Drive.

The foreground of views from SH1 is of a road environment, often consisting of roadside batters and roadside vegetation. Views of the Landholding are most notably observed at least 4km south of the Landholding in more elevated portions of the road (which descends in elevation as it approaches the Landholding). For those along Great South Road, the foreground to these views is of an arable landscape where land uses are focused toward vegetable growing. Occasional tree stands remain in addition to occasional farm and residential buildings.

Proposed View

During the period of Stage 1, change will be visible in relation to the removal of pine to the west of the site, in addition to the progressive stripping of topsoil and initial benching of the southern part of the proposed quarry pit. The north bund will also be gradually formed during this time and western portions may be observed, particularly from locations such as VP9 and VP10. This change will be observed in the context of the existing quarry. Moreover, for those travelling along Great South Road and SH1, views will be brief and transitory. Notwithstanding this, values ascribed to these views are not wholly related to the quarry landscape which is particularly prominent.

For those that ascribe values to the views of Kaarearea paa from these locations, whilst somewhat reduced in its prominence through its comparable elevation to surrounding ridges and the distance it is observed, it is still considered as an identifiable feature within this context. Moreover, it is not considered that the reduced visibility of the feature through distance necessarily reduces the value attached to views. It is considered that the meaning associated with this particular landscape feature will be in part diminished although many of the values attached to these views are also associated with a quarry landscape. With the above in mind, it is considered effects will be **Low** adverse.

As the Project moves forward into Stage 2, the upper areas of benching, within the western portion of the site will become more visible and may be perceived as an extension of the

existing quarry pit. From these locations, the upper portion of the northern bund will become visible on the horizon of the view. Revegetation planting, particularly along the slopes to the east of the existing quarry will become more established by this time and read as a cohesive vegetated block and in places extending out from Kaarearea paa. However, although revegetation of the slopes will contribute to more elevated visual values, effects will increase to **Low-Moderate** adverse levels due to the greater extent of the quarry expansion being visible in addition to the further reduction of Kaarearea paa being observed as a landscape feature in these views.

During Stage 3, Stage 4 and 5 (Life of Quarry), the views toward the site from these locations will continue to change, most notably views of the upper portions of the quarry and particularly the eastern portion will become visible to the left of Kaarearea paa. As Stage 5 nears completion, it is accepted that there would be some reduction in the extent of exposed quarry faces being visible and the Landholding would remain backdropped by the Sonja Drive Ridge, Ponga Road ridges in addition to Ōpaheke at 329mRL. However, the removal of the northern and eastern ridge will visibly alter the sequence of ridges within and around the context of the site. Revegetation to the east of the existing quarry will be fully established, containing a range of mature native trees.

While modifications to the ridgelines and the exposure of cut faces will alter the visual character of the landscape for these viewing audiences, the early establishment of native vegetation on the southern slopes, including those surrounding Kaarearea Paa, will help soften these changes and reduce their prominence. This vegetation will also create a physical connection between Kaarearea Paa and the surrounding ridges, which will further assist in linking it back to the landscape. In addition, exotic vegetation to the north of the northern bund, which will become visible in Stage 5, will contribute to the continuity of the ridgelines around the site and on either side of Kaarearea Paa.

This revegetation planting will provide the opportunity to build on the existing vegetated values of the feature and the wider site, partially reconnecting it to the wider landscape, by strengthening some landscape patterns. This will in part mitigate aspects of the effects on the values associated with the views of Kaarearea paa, however the residual exposing of land in the form of benches seen within the views will result in permanent change which is considered adverse. Moreover, it is considered that while views are characterised by an existing quarry (and will continue to do so as a result of the proposed expansion), the cumulative impact of quarrying activities in the context of Kaarearea paa will result in adverse effects which are considered to be **Moderate**.

7.3.8 Viewing Audience Group 8:

Figure References:

- *Appendix 3: Figure 16 and VP11 and VP12*
- *Appendix 4: Figure 1 and VS11*

Viewing Audiences:

- *Residents and road users along Sonja Drive, Laurie Drive and Ponga Road to the north of the site*

Existing View

Both Sonja Drive and Laurie Drive are elevated local roads which steam off Ponga Road, to the east. These roads follow ridges to the north and north east of the site, at contours of around 300mRL to 260mRL. Residential properties are principally focused near to the roads however

some, particularly those at the western end of Sonja Drive, sit on minor spurs along long private accessways. Mature indigenous vegetation occupies the most areas of the slopes and therefore almost entirely restricts views towards the site from the road, apart from two locations, both near the terminus of the two roads. Vegetation along the slopes also tends to obscure direct views to the south west and south in the direction of the site. Notwithstanding this, occasional views are attainable.

For those that do attain views, their outlook will be of a vegetated foreground, characterised by the SEA and ONL landscape for which many of these viewing audiences are within, notably the majority of those along Sonja Drive. The north facing pasture covered slopes of the site are attainable in views towards the western portion of Sonja Drive and at the southern end of Laurie Road (VP11 and VP12). From other locations along Sonja Drive and Laurie Drive, the undulating vegetated landforms occupying the northern portion of the site (within the ONL), do however limit views towards the site. Limited areas of pasture may be visible, particularly the north eastern most pasture covered slopes of the site, which is in the vicinity of the proposed quarry expansion (within Stage 4). This north eastern area of the site reaches an approximate elevation of 280mRL. Kaarearea paa is visible in some views from these northern locations, although it is noted that the aforementioned undulating landforms may in part, or entirely obscure views of the feature.

Proposed View

During Stage 1, the greatest change to these views will be the progressive development of the northern bund. Whilst remaining beyond the ONL delineation, the earthworks will be a visible 'detraction' to the amenity qualities of the ONL and therefore effects will be more elevated. The northern bund will be grassed, however during earthworks and the depositing of material the exposed bare earth will likely result in temporary adverse effects considered up to **Moderate-High** for those viewing audiences which attain views.

By Stage 2, the northern bund will have been completed and established in grass. Exotic tree planting established near the boundary of the ONL (at the toe of the bund) will be established throughout this period and will meet ecological mitigation planting established in the peripheral pasture slope of the ONL which is seen along the edge of the site. During this time, the northern bund will provide some limited visual screening of the proposed quarry activities. It is anticipated that views of these activities will be obscured particularly from western locations along Sonja Drive. With the above in mind, it is considered any adverse effects will reduce to **Low-Moderate**.

Through Stage 3 and Stage 4, the quarry will broadly expand behind the northern bund. While views of the quarry activities will be largely obscured, views of the upper portion of the eastern quarry faces will however become visible during this time. With the above in mind, it is considered adverse effects could be up to **Moderate-High** for some of these residents⁴⁰ particularly given views of such activities would not be an anticipated characteristic.

During Stage 5, the northern bund would be removed as the quarry expands further north and east. It is proposed that the works towards the east are undertaken first before the northern bund is removed. This will allow for the exposed cut faces (which would be further revealed following the removal of the northern bund) to be lowered as the eastern ridge is modified. Exotic tree planting established along the toe of the northern bund by this point will have reached its mature height (after at least 40 years of growth, reaching approximately 40m in height) and further supplemented by indigenous vegetation established within the ONL. Following removal of the bund during Stage 5, this tree planting will assist to heavily filter views of the quarry behind. Notwithstanding this, it is anticipated that some views towards the quarry

⁴⁰ These include 16, 72, 99, 109 and 111 Sonja Drive and 1065, 1081, 1101 and 1109, Ponga Road

will could be partially attainable from a number of elevated residents⁴⁰, despite tree planting often surrounding and seen in the context of these properties. With the above considered, effects would remain up to **Moderate-High** for these residents.

8.0 Evaluation in Relation to Statutory Provisions

8.1 RMA - Section 6

In relation to the preservation of natural character values with respect to the wetlands, streams and their margins, the Project will effectively remove these features from within the footprint of the quarry. Whilst these features are not considered to be high or very high in their degree of natural character, these effects will however be elevated and permanent. It is considered the greatest effects will be **Moderate-High** however in considering the offsetting and compensation together with the underlying zoning the greatest adverse effects would be **Moderate**.

The identified ONL within the Landholding will not be directly impacted by the Project through quarrying operations. A peripheral pasture area has been identified as an opportunity for ecological mitigation. Particularly given its physical connection to the neighbouring SEA to the north. Whilst it is acknowledged that pasture areas are identified as an attribute of the ONL, it is considered that establishment of indigenous vegetation in this area is consistent with the natural attributes which underpin the ONL. With the above in considered the indirect adverse effects on the ONL will be **Low**.

In relation to section 6(e) and the relationship of Māori and their culture and traditions with their ancestral landscape, it is acknowledged that iwi have a special connection with the land and waterways of the site. Whilst it is recognised that the landscape of the site will change through its broad alignment with the underlying special purpose zoning, and as such these activities are somewhat anticipated, the Project will minimise impacts on identified attributes seen to hold particular cultural landscape value wherever possible. Where effects are not able to be avoided or mitigated (e.g. streams and wetlands in the footprint of the pit) offsetting is proposed.

Kaarearea paa is recognised as a significant cultural landscape feature. The Project responds through not only avoiding the associated Historic Heritage Extent of Place overlay in the AUP, the quarry footprint is further set back away from the landscape feature which has included relinquishing Special Purpose – Quarry zoned land. This setback area, among other pasture covered slopes in the context of this feature will be returned to indigenous vegetation and whilst quarrying activities will detract from the feature, the enhancement of vegetation patterns across areas of the site will assist in counterbalancing these effects.

8.2 RMA – Section 7

In considering the amenity values⁴¹ and quality of the environment⁴², the amenity values of the Landholding are in part derived from its rural land use, and quarry context. It is however recognised that the site holds a number of natural and physical qualities and characteristics which contribute to the amenity values. This includes the streams, wetlands, areas of native vegetation and the underlying topographical landform of the site. Whilst these natural qualities

⁴¹ RMA s7(c)

⁴² RMA s7(f)

are degraded through its land use, they individually and collectively contribute to the aesthetic values of the site. Cultural aspects also form part of amenity values and it is acknowledged that the site holds cultural landscape values.

The Project will by its very nature impact on the amenity values and the quality of the environment. Whilst the current 'condition' of a number of areas within the site do not hold high qualities in relation to the physical resources and people's appreciation of aesthetic coherence, it is considered the ultimate nature of the proposed activity and resultant landscape condition will mean that with the footprint of the proposed quarry effects will be very high. With mitigation such as that proposed, and considering the wider Landholding, its characteristics and associated amenity values, landscape effects are anticipated to be **Moderate**.

8.3 Auckland Unitary Plan

Special Purpose - Quarry Zone

The large majority of the project will take place within the Special Purpose - Quarry Zone and the wider Landholding allows for some separation between quarry activities and neighbouring residential viewing audiences. Visual mitigation techniques have been employed through the use of vegetation screening to the north and west in order to limit views of the quarrying activities. Notwithstanding this, a large part of the Project will take place within this zone and such activities in relation to mineral extraction are anticipated. The existing Drury Quarry has been in operation on the Landholding for approximately 80 years and remains a defining part of the landscape.

Rural Zones / Mixed Rural Zone

The Project, including quarrying activities are proposed to occur partially in the Mixed Rural zone. This will occur across three areas to the north west, north east and south east of the proposed quarry expansion. These areas interface with the Special Purpose - Quarry zone and therefore it is considered that certain 'edge effects' to these interfaces, particularly quarry zones can be anticipated. This will undoubtedly impact on the rural characteristics and amenity values of neighbouring rural zones, where quarry activities occur in adjoining areas. In this case, the rural characteristics and amenity values of these three separate portions will change and therefore not reflect the anticipated characteristics and qualities associated with the rural zones.

9.0 Conclusion

In summary, the site is broadly characterised by an operating farm which occupies a series of connected and enclosing ridges, gullies, associated streams and wetlands and pockets of indigenous vegetation. Indigenous vegetation also exists around the periphery of the site which would be impacted in the later stages of the Project. In the context of the site are Kaarearea paa and an ONL. The majority of the Project falls within the Special Purpose – Quarry Zone of the AUP.

The consideration of Natural Character is limited to the watercourses on the site and the wetlands. Essentially any streams or wetlands within the footprint of the quarry pit will be removed although much of these features are located within the Special Purpose – Quarry Zone and as such there is a level of anticipation that these features could be impacted through quarry activities. A stream diversion will occur however it is accepted that the outcomes of the diversion

will not inherently reflect the natural character values which are removed. Offsetting is proposed to manage the adverse effects of stream and wetland loss. The greatest effects will be on Stream 1, 2b and the upper and middle portions of Stream 2 which will be **Moderate-High**, however in considering the offsetting and compensation together with the underlying zoning effects would range from **Low to Moderate**. The remaining effects on streams ranging from **Low-Moderate** to **Low** and with considering mitigation and the underlying zoning it is considered effects will be **Very Low**. Natural character effects will also occur on wetlands with the greatest effects on wetland 2a north which also holds the highest degree of natural character. These natural character effects are anticipated to be **Moderate** in level, reducing to **Very Low** in considering mitigation and the underlying zoning. The remaining wetlands are either outside of the footprint of the project (Wetland 2a south, 3 and 8), or subject to **Low-Moderate** adverse natural character effects. Further in considering the proposed mitigation and underlying zoning, these effects also reduce to **Very Low**.

In relation to landscape characteristics, attributes and values, the Project will facilitate a high degree of change to the site. This includes topographical changes, vegetation, wetland and stream removal. Effects on vegetation, wetlands and streams are mitigated, offset or compensated through planting or offsite enhancement/ restoration. While the Project will occur nearby the existing Drury Quarry, which is a distinctive feature of the site and project, it is acknowledged that the expansion—particularly beyond the northern and eastern ridges—will impact a different landscape catchment that is more closely associated with higher-value attributes.

The Project will however avoid physical effects on the ONL to the north of the quarry pit, apart from indigenous planting in an area of pasture. Careful consideration has also been undertaken in relation to Kaarearea paa whereby the pit design has been amended to accommodate further separation between the feature and the pit footprint. Notwithstanding this it is accepted that the overall landscape value of Kaarearea paa in the wider context will be reduced. With the above in mind, it is considered the effects on landscape attributes and values will range from **Low** to **Moderate** adverse with mitigation measures implemented.

Visual effects will vary across the identified visual catchment and associated viewing audiences. The below table summarises the visual effects in relation to viewing audience groups and Project Stages. All effects are considered adverse.

Table 4: Summary of Visual Effects

Viewing Audience Group	Stage 1 and 2 level of effect with mitigation	Stage 3 and 4 level of effect with mitigation	Stage 5 level of effect with mitigation
1	Low	Very Low	Very Low
2	Very Low	Very Low	Very Low
3	Very Low	Very Low	Very Low
4	Very Low to Low	Moderate	Low
5	Low	Low	Low
6	Low to Low--Moderate	Low -Moderate	Moderate

7	Low to Low-Moderate	Moderate	Moderate
8	Moderate-High to Low-Moderate	Moderate-High	Moderate-High

Overall, apart from a small number of viewing audiences to the north of the site who may experience Moderate-High effects, the adverse effects on the site's natural character, landscape, and visual amenity—as well as the surrounding landscape—are largely in line with expectations based on the site's zoning. Furthermore, adverse effects are addressed through a combination of avoiding key landscape features, as well as implementing compensation, offsetting, and mitigation measures.

Appendix 1: Landscape and Visual Effects Assessment Methodology

Natural Character and Landscape Effects Assessment Method

15 November 2023

This assessment method statement is consistent with the methodology (high-level system of concepts, principles, and approaches) of 'Te Tangi a te Manu: Aotearoa New Zealand Landscape Assessment Guidelines', Tuia Pito Ora New Zealand Institute of Landscape Architects, July 2022. The assessment provides separate chapters to discuss landscape, visual and natural character effects where relevant, but is referred to throughout as a Landscape Effects Assessment in accordance with these Guidelines. Specifically, the assessment of effects has examined the following:

- *The existing landscape;*
- *The nature of effect;*
- *The level of effect; and*
- *The significance of effect.*

The Existing Landscape

The first step of assessment entails examining the existing landscape in which potential effects may occur. This aspect of the assessment describes and interprets the specific landscape character and values which may be impacted by the Project alongside its natural character where relevant as set out further below. The existing landscape is assessed at a scale(s) commensurate with the potential nature of effects. It includes an understanding of the visual catchment and viewing audience relating to the Project including key representative public views. This aspect of the assessment entails both desk-top review (including drawing upon area-based landscape assessments where available) and field work/site surveys to examine and describe the specific factors and interplay of relevant attributes or dimensions, as follows:

Physical –relevant natural and human features and processes;

Perceptual –direct human sensory experience and its broader interpretation; and

Associative – intangible meanings and associations that influence how places are perceived.

Engagement with tāngata whenua

As part of the analysis of the existing landscape, the assessment should seek to identify relevant mana whenua (where possible) and describe the nature and extent of engagement, together with any relevant sources informing an understanding of the existing landscape from a Te Ao Māori perspective.

Statutory and Non-Statutory Provisions

The relevant provisions facilitating change also influence the consequent nature and level of effects. Relevant provisions encompass objectives and policies drawn from a broader analysis of the statutory context and which may anticipate change and certain outcomes for identified landscape values.

The Nature of Effect

The nature of effect assesses the outcome of the Project within the landscape. The nature of effect is considered in terms of whether effects are positive (beneficial) or negative (adverse) in the context within which they occur. Neutral effects may also occur where landscape or visual change is benign.

It should be emphasised that a change in a landscape (or view of a landscape) does not, of itself, necessarily constitute an adverse landscape effect. Landscapes are dynamic and are constantly changing in both subtle and more dramatic transformational ways; these changes are both natural and human induced. What is important when assessing and managing landscape change is that adverse effects are avoided or sufficiently mitigated to ameliorate adverse effects. The aim is to maintain or enhance the environment through appropriate design outcomes, recognising that both the nature and level of effects may change over time.

The Level of Effect

Where the nature of effect is assessed as '**adverse**', the assessment quantifies the level (degree or magnitude) of adverse effect. The level of effect has not been quantified where the nature of effect is neutral or beneficial. Assessing the level of effect entails professional judgement based on expertise and experience provided with explanations and reasons. The identified level of adverse natural character, landscape and visual effects adopts a universal seven-point scale from **very low** to **very high** consistent with Te Tangi a te Manu Guidelines and reproduced below.



Landscape Effects

A landscape effect relates to the change on a landscape's character and its inherent values and in the context of what change can be anticipated in that landscape in relation to relevant zoning and policy. The level of effect is influenced by the size or spatial scale, geographical extent, duration and reversibility of landscape change on the characteristics and values within the specific context in which they occur.

Visual Effects

Visual effects are a subset of landscape effects. They are consequence of changes to landscape values as experienced in views. To assess where visual effects of the Project may occur requires an identification of the area from where the Project may be visible from, and the specific viewing audience(s) affected. Visual effects are assessed with respect to landscape character and values. This can be influenced by several factors such as distance, orientation of the view, duration, extent of view occupied, screening and backdrop, as well as the potential change that could be anticipated in the view as a result of zone / policy provisions of relevant statutory plans.

Zone of Theoretical Visibility

As an initial step in the visual analysis, a Zone of Theoretical Visibility (ZTV) mapping exercise was undertaken of the site in its context to determine the likely extent of visibility in the wider landscape. ZTV mapping represents the area that a development may theoretically be seen - that is, it may not actually be visible in reality due to localised screening from intervening vegetation, buildings or other structures. In addition, ZTV mapping does not convey the nature or magnitude of visual impacts, for example whether visibility will result in positive or negative effects and whether these will be significant

Following the ZTV analysis, field work is used to determine the actual extent of visibility of the site, including the selection of representative viewpoints from public areas. This stage is also used to identify the potential 'viewing audience' e.g. residential, visitors, recreation users, and

other groups of viewers who can see the site. During fieldwork, photographs are taken to represent views from available viewing audiences.

The viewing audience comprises the individuals or groups of people occupying or using the properties, roads, footpaths and public open spaces that lie within the visual envelope or 'zone of theoretical visibility (ZTV)' of the site and Project. Where possible, computer modelling can assist to determine the theoretical extent of visibility together with field work to confirm this. Where appropriate, key representative viewpoints should be agreed with the relevant local authority.

Natural Character Effects

Natural Character, under the RMA, specifically relates to *'the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development'*. Therefore, the assessment of natural character effects only involves examining the proposed changes to natural elements, patterns and process which may occur in relevant landscape / seascape contexts.

As with assessing landscape effects, the first step when assessing natural character effects involves identifying the relevant physical and experiential characteristics and qualities which occur and may be affected by a Project at a commensurate scale. This can be supported through the input of technical disciplines such as geomorphology, hydrology, marine, freshwater, and terrestrial ecology as well as input from tāngata whenua. An understanding of natural character considers the level of naturalness and essentially reflects the current condition of the environment assessed in relation to the seven-point scale. A higher level of natural character means the waterbody and/or margin is less modified and vice versa.

For the purposes of describing and assessing natural character, the streams and wetlands have been considered as two interrelated components; active bed and margin. Each component can be described and assessed in terms of the attributes and qualities that comprise them.

Active Bed

The active bed comprises the wetted areas/channels and may include dry margins, islands, banks and abandoned channels that form part of the streams natural migration across the riverbed, as well as flood channels, and side channels.

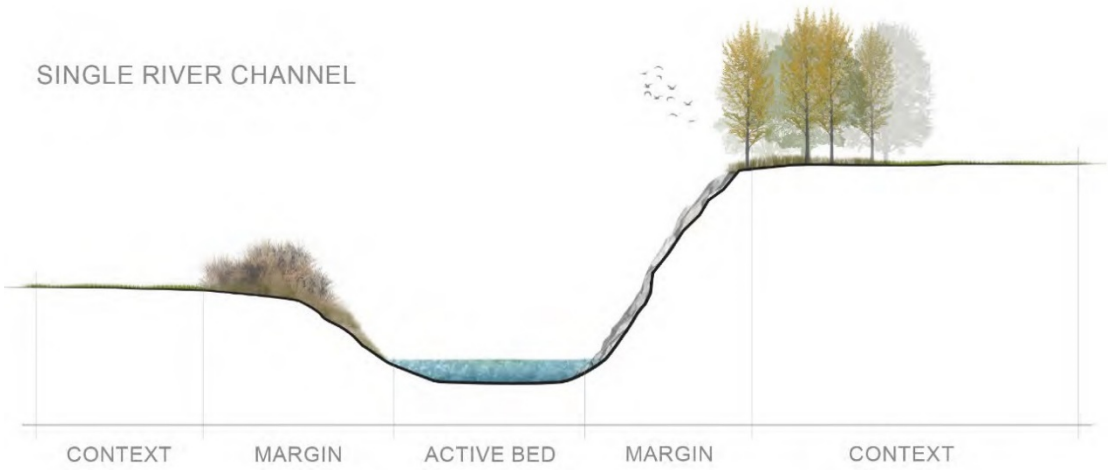
Margins

The margin refers to the area between the active bed and the wider landscape context, including the banks. River processes, patterns and influences will be evident in the margin, such as occasional flooding, historic banks and channel patterns. Generally topographic features define the extent of the margin as they extend between the top and base of stopbanks or terraces. Vegetation type boundaries can also define the margin extent, such as where riparian vegetation or flood protection planting meets the wider landscape context.

Table 2 below describes the attributes and qualities used to describe and assess the level of natural character, recognising that the active bed and margin have differing attributes and qualities.

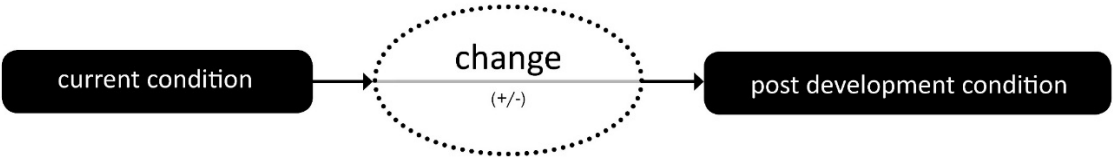
Biophysical (Active bed and margins)
Active Bed - Flow Regime– how natural/modified are the flows or stream/ wetland level changes (culverts, artificially induced, diversions, altered flow pattern). - Stream or Wetland morphology- active bed shape, including, sedimentation, structures and human modifications. - Aquatic ecology - Indigenous taxa assemblages, ecosystem functioning, Presence / absence of exotic aquatic flora and fauna, including presence of pest species. Periphyton and Macro invertebrates provide indication of water quality. - Water quality (if available)
Margins - Morphology- Stream bank / wetland margin shape, including sedimentation, structures and human induced modifications. - Riparian vegetation and habitat – indigenous vegetation and fauna, as well as presence of pest species.
Experiential
- Human perception of naturalness of waterbody. The expression of the biophysical attributes. - How natural does the area appear (dominance of human activity) - The remote/untamed experience. - Experiential attributes such as sound of water, smells, feel and transient values.

Table 1: Natural Character Attributes



A natural character effect is a change to the current condition of parts of the environment where natural character occurs. Change can be negative or positive. The resultant natural character effect is influenced by the existing level of naturalness within which change is proposed; a greater level of effect will generally occur when the Project reduces the naturalness of a less modified environment. In short, the process of assessing natural character effects can be summarised as follows:

- Identify the characteristics and qualities which contribute to natural character within a relevant context and defined spatial scale(s), including the existing level of naturalness;
- Describe the changes to identified characteristics and qualities and the consequent level of natural character anticipated (post Project); and
- Determine the overall level of effect based on the consequence of change.



The Significance of Effects

Decision makers assessing resource consent applications must evaluate if the effect on individuals or the environment is less than minor⁴³ or if an adverse effect on the environment is no more than minor⁴⁴. For non-complying activities, consent can only be granted if the s104D 'gateway test' is satisfied, ensuring adverse effects are minor or align with planning objectives. In these situations, the assessment may be required to translate the level of effect in terms of RMA terminology.

This assessment has adopted the following scale applied to relevant RMA circumstances⁴⁵ (refer to diagram below), acknowledging low and very low adverse effects generally equate to 'less than minor' and high / very high effects generally equate to significant⁴⁶.



⁴³ RMA, Section 95E

⁴⁴ RMA, Section 95E

⁴⁵ Seven-point level of effect scale. Source: Te tangi a te Manu, Pg. 15

⁴⁶ The term 'significant adverse effects' applies to specific RMA situations, including the consideration of alternatives for Notices of Requirement and AEEs, as well as assessing natural character effects under the NZ Coastal Policy Statement.

Appendix 2: Natural Character Evaluation

Table 2.1: Stream Natural Character Evaluation

Stream 1	
Existing Natural Character Description	Rating
Biophysical – Active Bed - Continuous depth and presence of water, and a large catchment size (3.4 ha). Stream classified as a permanent stream by project ecologists. - Flows in a general east to west direction for 345 m before discharging directly into Wetland - Good water flow with a moderate degree of hydrological heterogeneity present. This included riffles, runs, drops and deep pools - The substrate was dominated by silt with wood and small gravel providing some low-quality macroinvertebrate habitat - Multiple kōura were captured and no indigenous fish were observed	Moderate-high
Biophysical – Margins - The stream has incised banks and undercut banks present - The riparian area is damaged by stock - Comprises of grass and bare ground under a canopy of native trees	Moderate
Experiential Whilst human modification was not evident, indirect modification through browsing stock damage has reduced opportunities to experience wildness and remoteness	Moderate
Stream 1b	
Existing Natural Character Description	Rating
Biophysical – Active Bed - Classified as an intermittent stream - Flows in a general north to south direction for 74 m before discharging directly into Wetland 1a - Shallow depth throughout (average 0.03m) - Narrow stream channel (average 0.19m) - Classified as low ecological value by project ecologists	Low
Biophysical – Margins - The riparian area is damaged by stock - Comprises of grass and bare ground	Low

Experiential

Low

- Indirect modification through browsing stock damage has reduced opportunities to experience wildness and remoteness

Stream 2

Existing Natural Character Description

Rating

Biophysical – Active Bed

Moderate-high

- Considered an intermittent stream, transitioning into a permanent stream.
- Flows east to west for 276m before draining into a wetland, before flowing for another 45m and then terminating at a culverted crossing.
- High degree of hydrological heterogeneity, with pool run sequences, riffles, chutes and large pools
- The substrate dominated by hard substrates including gravel, cobbles and bedrock; however, layers of deposited fine sediments exist reducing the quality of macroinvertebrate habitat
- Multiple kōura were captured
- No indigenous fish were observed although a longfin eel was captured

Biophysical – Margins

Moderate-high

- Average 0.71 m stream channel width with incised and undercut channel banks
- Small reaches flowed through farmland
- Riparian vegetation through the entirety of the stream includes mixed exotic and native vegetation, with the headwaters of the stream originating within a section of SEA (SEA_5323)
- Vegetation includes, gorse, pine and various indigenous vegetation including kahikatea, ponga and kānuka

Experiential

Moderate-high

- Headwaters and upper reaches of the stream contain SEA indigenous vegetation restricts visual influence of surrounding farmland. In combination with the experience of multiple pool run sequences and other related hydrological processes elevate the experiential level of natural character.
- Other reaches of the stream do however pass through areas of farmland which includes culverted farm crossings and the presence of exotic species reduces the naturalness and remote qualities of the stream corridor.

Stream 2b	
Existing Natural Character Description	Rating
Biophysical – Active Bed • Forms a confluence with Stream 2. • Considered an intermittent stream and contains very shallow pool runs • Flows east to west for 241m • The substrate dominated by hard substrates including gravel and bedrock; however, layers of deposited fine sediments present reducing the quality of macroinvertebrate habitat • Multiple kōura were captured • No indigenous fish were observed although a longfin eel was captured	Moderate-high
Biophysical – Margins • Average 0.28 m stream channel width with incised channel • Riparian vegetation includes sparse native trees with sub-canopy and groundcover consisting of pasture grass. Stream is located within a section of SEA (SEA_5323) • Vegetation includes kahikatea, ponga and kānuka	Moderate-high
Experiential • Headwaters and upper reaches of the stream contain SEA indigenous vegetation restricts visual influence of surrounding farmland. Pasture is however present along margins and stream contains very shallow pool runs. • Modified environment through stock impacts including pugging on stream banks and influence of exotic species reduces the naturalness and remote qualities of the stream corridor.	Moderate-high

Stream 3	
Existing Natural Character Description	Rating
Biophysical – Active Bed • Meets intermittent stream criteria, and due to the shallow depth throughout and small catchment size (2.9 ha) • 135 m long, flowing in a south to north direction • Headwaters of Stream originated within a small palustrine wetland • The average depth of the stream was 0.03m • Water flow was slow with the stream reach consisting of a single run • Substrate dominated by soft substrates with an unnatural loading of fine sediments providing low quality macroinvertebrate habitat	Low

Biophysical – Margins

Low

- The stream channel was an average of 0.39m in width
- Pugging impacts observed through the channel banks
- The riparian vegetation predominantly consisted of pasture grass with pines present on the downstream reach
- Additional vegetation observed throughout the entire reach included gorse, and some kiokio

Experiential

Low

- As an intermittent stream with low water depth, the hydrological processes are not always clearly legible and only a single run was present. Notwithstanding this, some transient experiences in relation to high rainfall events will undoubtedly somewhat increase the experiential level of natural character
- Low quality water combined with disturbed channel margins and exotic pasture grass reinforces human land use influence on stream corridor

Stream 4

Existing Natural Character Description

Rating

Biophysical – Active Bed

Moderate

- Continuous depth and presence of water, large catchment size (97ha) and classified as a permanent stream
- The stream is 371 m in length, flowing in an east to west direction and drained into a large, constructed pond
- The stream had an average water depth of .22m
- Water flow was good throughout the reach with pools runs and riffles present, and the stream was dominated by hard substrates, including gravel, cobbles and bedrock with some wood present providing good macroinvertebrate habitat
- Silt substrates were however present and there was an unnatural loading of fine sediments
- One mature longfin eel was captured within the stream measuring over 1 m in length

Biophysical – Margins

Low

- The upper 371 metres of Stream 4 (between Stream 2 and Stream 5's confluences) had an average width of 1.52 (0.9 m to 2.58 m); the middle reach, (between Stream 5 and the pond), had an average width of 1.78 (1.1 m – 2.54 m); and the downstream reach, downstream of the access road culvert below the pond, had an average width of 2.51 (1.52 – 4.5)
- The riparian yard included gorse and pasture grass with some native vegetation present
- The margins also had a ground cover of pasture grass which was largely uniform was sparse patches of bare banks

Experiential

Moderate

- As a permanent stream with good water flow and good macroinvertebrate habitat, the active bed had a more elevated experiential level of natural character than the margins which included pasture grass and gorse, with some native vegetation.

Stream 5

Existing Natural Character Description

Rating

Biophysical – Active Bed

Moderate

- Classified as an intermittent stream in the upper reaches but transitions into a permanent stream downstream, cumulatively 489 m in length
- Average water depth of 0.06m
- Water flow was slow throughout the reach and runs, chutes, pools and a waterfall present
- Substrate was dominated by fine sediments smothering the bedrock base providing some low-quality macroinvertebrate habitat
- Occasional hard substrates and small wood present

Biophysical – Margins

Low

- Banks ranged between 0.21 m to 1.3 m (average 0.56m)
- Channel banks highly pugged and incised
- Vegetation within the riparian yard included rank grasses, foxglove, gorse, and woolly nightshade, with a diverse range of indigenous vegetation including, but not limited to, kahikatea, tawa, tōtara, nīkau, taraire and miro

Experiential

Moderate

- Permanent down stream contains slow moving water but includes various active bed features contributing to experiential natural character levels
- Water provided some low quality macroinvertebrate habitat with fine sediments – i.e. water is not visually clear or pristine
- Riparian vegetation includes exotics but also diverse range of indigenous vegetation supporting level of naturalness

Stream 6

Existing Natural Character Description

Rating

Biophysical – Active Bed

Moderate

- Classified as an intermittent stream
- Flowed in a southern direction forming a confluence and draining into stream 7. Multiple tributaries flow into the stream creating a total of 1,0343m of stream length
- Average Stream depth of 0.08m

- Water flow was slow with runs, riffles and shallow pools present providing a moderate degree of habitat to macroinvertebrates
- Rock face waterfalls present on the upper reaches
- Stream dominated by soft substrates with some hard substrates

Biophysical – Margins

Low

- Stream channel was an average of 0.61m
- Channel banks were highly incised with some undercut banks
- Riparian vegetation largely consisted of rank pasture grasses and fox glove, with mature trees including pine, kānuka, pukatea, and gorse

Experiential

Moderate-low

- The biophysical natural character levels of the active bed, in particular the permeant stream length, water flows and moderate degree of habitat for macroinvertebrate contributes to the human perception of the waterbody.
- The lack of indigenous riparian vegetation including rank pasture (representing indirect human influence), and associated habitat however reduces these experiential attributes

Stream 7

Existing Natural Character Description

Rating

Biophysical – Active Bed

Low

- Intermittent stream section length 292m
- Permanent stream section length 270m
- Average water depth of 0.15m
- Poor hydrological heterogeneity with the reach consisting of a single run
- Stream bed was entirely soft bottomed with the base consisting of compacted clay with a low diversity of aquatic habitat

Biophysical – Margins

Low

- Average channel width of 0.53 m (upper) and 1.38m (lower)
- Stream banks highly impacted by stock pugging
- Riparian vegetation throughout stream included gorse and pasture grass

Experiential

Low

Reduced experiential levels of naturalness through poor hydrological heterogeneity and low diversity of aquatic habitat within active bed.

Stock damage along stream banks in addition to exotic vegetation further demonstrates human influence on stream, reducing sense of remoteness

Stream 9	
Existing Natural Character Description	Rating
Biophysical – Active Bed - Intermittent stream located in a separate catchment to Streams 1 to 7 - Flows in a south to north direction for 30m before exiting the pit extent - Shallow depth consisting of shallow trickles and isolated pools - Water flow was slow consisting of a single run - Substrate dominated by soft substrates with fine sediments and some woody debris and leaf litter	Low
Biophysical – Margins - Stream channel ranged between 0.15m to 0.2m channel width of 0.53m (upper) and 1.38m (lower) - Riparian vegetation predominantly pines, whekī, and pōnga	Low
Experiential - Reduced experiential levels of naturalness through poor hydrological heterogeneity and low diversity of aquatic habitat within active bed - Presence of exotic vegetation further demonstrates human influence on stream, reducing sense of remoteness	Low

Table 2.2: Wetland Natural Character Evaluation

Wetland 1a	
Existing Natural Character Description	Rating
Biophysical – Active Bed and Margins - Formed in a valley bottom with a wide, flat base which has naturally slowed drainage and is likely to be saturated year-round (i.e. a permanent wetland) - Only one dominant hydrological unit, which is where flows are non-channelised and slowly move through the vegetation. No pools or open sections of channel observed - Classified as an exotic wetland by project ecologists - Dominated by exotic species with occasional native species - Stock damage evident through pugging and grazing - Increase sedimentation and reduced water quality - No effective riparian buffer - No threatened or at risk flora or fauna species but may be a temporary habitat for longfin eels	Moderate-Low

Experiential

Low

- Highly modified from its original vegetation which will have been a form of wetland forest such as Kahikatea and, pukatea forest.
- Indirect human effects through stock access

Wetland 1b

Existing Natural Character Description

Rating

Biophysical – Active Bed and Margins

Moderate-Low

- Formed as the channel and margins of an intermittent stream which has been repeatedly pugged and flattened into a wider channel by stock.
- Primarily an intermittent wetland due to small size of catchment and plant species.
- Only one dominant hydrological unit, which is where flows are non-channelised and slowly move through the vegetation. No pools or open sections of channel observed
- Classified as an exotic wetland by project ecologists
- Dominated by exotic species with occasional native species
- Stock damage evident through pugging and grazing
- Increase sedimentation and reduced water quality
- No effective riparian buffer
- Highly unlikely to provide habitat for long-fin eels

Experiential

Low

- Highly modified from its original vegetation which will have been a form of wetland forest such as Kahikatea and, pukatea forest. Some indigenous trees do however remain.
- Indirect human effects through stock access

Wetland 1c

Existing Natural Character Description

Rating

Biophysical – Active Bed and Margins

Moderate-Low

- Located on the floodplain of Stream 1b.
- Fed via groundwater and surface flows – considered to be intermittent wetland. Formed as the channel and margins of an intermittent stream have been repeatedly pugged and flattened into a wider channel by stock.
- Only one dominant hydrological unit, which is where flows are non-channelised and slowly move through the vegetation. No pools or open sections of channel observed
- Classified as an exotic wetland by project ecologists

- Dominated by exotic species with occasional native species
- Stock damage evident through pugging and grazing
- Increase sedimentation and reduced water quality
- No effective riparian buffer
- No threatened or at risk flora or fauna species
- Highly unlikely to provide habitat for long-fin eels

Experiential

Low

- Highly modified from its original vegetation which will have been a form of wetland forest such as Kahikatea and, pukatea forest. Some indigenous trees do however remain.
- Indirect human effects through stock access

Wetland 2a

Existing Natural Character Description

Rating

Biophysical – Active Bed and Margins

Moderate

- Formed in a valley bottom with a wide, flat base which has naturally slowed drainage and is likely to be saturated year-round (i.e. a permanent wetland)
- Two distinct vegetation types which are exotic wetland vegetation and Raupō Reedland
- Only one dominant hydrological unit, which is where flows are non-channelised and slowly move through the vegetation. No pools or open sections of channel observed
- Stock damage evident through pugging and grazing - unfenced
- Increase sedimentation and reduced water quality
- No effective riparian buffer – vegetation includes grazed pasture
- No threatened or at risk flora or fauna species but may be a temporary habitat for longfin eels

Experiential

Moderate-Low

- Highly modified from its original vegetation which will have been a form of wetland forest such as Kahikatea and, pukatea forest.
- Indirect human effects through stock access
- Raupō Reedland is a well-known and easily recognisable New Zealand wetland plant and would result in some elevated levels of naturalness when compared to exotic wetland areas

Wetland 2b	
Existing Natural Character Description	Rating
Biophysical – Active Bed and Margins • Located 70m downstream of Wetland 2a • Also formed in a valley bottom with a wide, flat base which has naturally slowed drainage and is likely to be saturated year-round (i.e. a permanent wetland) • Wetland is dominated by exotic plant species • Classified as an exotic wetland by project ecologists • Only one dominant hydrological unit, which is where flows are non-channelised and slowly move through the vegetation. No pools or open sections of channel observed • Unfenced and subject to frequent stock access • Increase sedimentation and reduced water quality • No effective riparian buffer – vegetation includes grazed pasture • Only one dominate vegetative tier limiting its diversity in terms of vegetation and provision of microhabitats	Moderate-Low
Experiential • Highly modified from its original vegetation which will have been a form of wetland forest such as Kahikatea and, pukatea forest. • Indirect human effects through stock access	Low

Wetland 3	
Existing Natural Character Description	Rating
Biophysical – Active Bed and Margins • Forms the headwaters of Stream 3 • Is an intermittent wetland • Wetland is dominated by exotic plant species • Classified as an exotic wetland by project ecologists • Only one dominant hydrological unit, which is where flows are non-channelised and slowly move through the vegetation. No pools or open sections of channel observed • Unfenced and subject to frequent stock access • Increase sedimentation and reduced water quality • No effective riparian buffer – vegetation includes grazed pasture • No threatened or at risk flora or fauna species • Only one dominate vegetative tier limiting its diversity in terms of vegetation and provision of microhabitats	Moderate-Low

Experiential

Low

- Highly modified from its original vegetation which will have been a form of wetland forest such as Kahikatea and, pukatea forest.
- Indirect human effects through stock access

Wetland 6a and 6b

Existing Natural Character Description

Rating

Biophysical – Active Bed and Margins

Moderate-
Low

- Both wetlands highly similar in terms of hydrology, vegetation and location
- Forms the headwaters of Stream 6 in a natural basin
- Is an intermittent wetland throughout most if not all of its extent
- Wetland is dominated by exotic plant species
- Classified as an exotic wetland by project ecologists
- Only one dominant hydrological unit, which is where flows are non-channelised and slowly move through the vegetation. No pools or open sections of channel observed
- Unfenced and subject to frequent stock access
- Increase sedimentation and reduced water quality
- No effective riparian buffer – vegetation includes grazed pasture
- No threatened or at risk flora or fauna species. Highly unlikely to provide habitat for long-fin eel due to the lack of upstream habitat.
- Only one dominate vegetative tier limiting its diversity in terms of vegetation and provision of microhabitats

Experiential

Low

- Highly modified from its original vegetation which will have been a form of wetland forest such as Kahikatea and, pukatea forest.
- Indirect human effects through stock access

Wetland 6c	
Existing Natural Character Description	Rating
Biophysical – Active Bed and Margins - Palustrine wetland located on floodplain of Stream 6 and located in gently sloping depression. - Likely to be saturated during wet periods and is considered a permanent wetland - Classified as an exotic wetland by project ecologists - Only one dominant hydrological unit, which is where flows are non-channelised and slowly move through the vegetation. - Unfenced and subject to frequent stock access - Increase sedimentation and reduced water quality - No effective riparian buffer – vegetation includes grazed pasture - No threatened or at risk flora or fauna species. Highly unlikely to provide habitat for long-fin eel - Only one dominate vegetative tier. Kahikateas tree tier is present but in poor condition.	Moderate-Low
Experiential - Highly modified from its original vegetation which will have been a form of wetland forest such as Kahikatea and, pukatea forest. - Indirect human effects through stock access	Low

Wetland 6d	
Existing Natural Character Description	Rating
Biophysical – Active Bed and Margins - Palustrine wetland located on floodplain of Stream 6 and located in gently sloping depression. - Likely fed through a combination of surface water and groundwater flows with additional inputs from Stream 6 - Classified as a natural inland wetland - Likely to be saturated during wet periods and is considered a permanent wetland - Exotic and indigenous vegetation species equally exist within the wetland. - No trees or other structural vegetation tiers present. - No riparian bugger for much of its extent. Some gorse bushes were present in riparian area. - Unfenced and subject to frequent stock access	Moderate-Low

- Increase sedimentation and reduced water quality
- No effective riparian buffer – vegetation includes grazed pasture
- No threatened or at risk flora or fauna species. May provide temporary habitat for longfin eel.

Experiential

Low

- Highly modified from its original vegetation which will have been a form of wetland forest such as Kahikatea and, pukatea forest.
- Indirect human effects through stock access

Wetland 7a

Existing Natural Character Description

Rating

Biophysical – Active Bed and Margins

Moderate-Low

- Forms midway along Stream 7 and is located adjacent to the main stream channel.
- Likely to be an induced wetland formed as the channel and margins of Stream 7 have been repeatedly pugged and flattened.
- Is an intermittent wetland
- Wetland is dominated by exotic plant species
- Classified as an exotic wetland by project ecologists
- Only one dominant hydrological unit, which is where flows are non-channelised and slowly move through the vegetation. No pools or open sections of channel observed
- Unfenced and subject to frequent stock access
- Increase sedimentation and reduced water quality
- No effective riparian buffer – vegetation includes grazed pasture
- No threatened or at risk flora or fauna species. Highly unlikely to provide habitat for long-fin eel due to the lack of upstream habitat.
- Only one dominate vegetative tier limiting its diversity in terms of vegetation and provision of microhabitats

Experiential

Low

- Highly modified from its original vegetation which will have been a form of wetland forest such as Kahikatea and, pukatea forest.
- Indirect human effects through stock access

Wetland 7b	
Existing Natural Character Description	Rating
Biophysical – Active Bed and Margins • Located within a shallow uneven depression • Fed via groundwater and surface flows – considered to be intermittent wetland. • Classified as a natural inland wetland and likely induced through pugging of an intermittent stream. • Only one dominant hydrological unit, which is where flows are non-channelised and slowly move through the vegetation. No pools or open sections of channel observed • Classified as an exotic wetland by project ecologists • Dominated by exotic species • Stock damage evident through pugging and grazing • Increase sedimentation and reduced water quality • No effective riparian buffer • No threatened or at risk flora or fauna species • Highly unlikely to provide habitat for long-fin eels	Moderate-Low
Experiential • Highly modified from its original vegetation which will have been a form of wetland forest such as Kahikatea and, pukatea forest. • Indirect human effects through stock access	Low

Wetland 8	
Existing Natural Character Description	Rating
Biophysical – Active Bed and Margins • A seepage wetland formed in an overland flow path discharging directly into Stream 4. • Is an intermittent wetland • Wetland is dominated by exotic plant species • Classified as an exotic wetland by project ecologists • Only one dominant hydrological unit, which is where flows are non-channelised and slowly move through the vegetation. No pools or open sections of channel observed • Unfenced and subject to frequent stock access • Increase sedimentation and reduced water quality	Moderate-Low

- Pine planting within riparian zone provides some buffer to the wetland. Limited subcanopy and largely no existent groundcover.
- No threatened or at risk flora or fauna species. Highly unlikely to provide habitat for long-fin eel due to the lack of upstream habitat.
- Only one dominate vegetative tier (exotic Pine excluded), limiting its diversity in terms of vegetation and provision of microhabitats

Experiential

Low

- Highly modified from its original vegetation which will have been a form of wetland forest such as Kahikatea and, pukatea forest.
- Indirect human effects through stock access

Wetland 9

Existing Natural Character Description

Rating

Biophysical – Active Bed and Margins

Moderate-Low

- Located within a shallow depression at the headwaters of Stream 9
- Fed via groundwater and surface flows – considered to be intermittent wetland.
- Classified as a natural inland wetland and likely induced through pugging of an intermittent stream.
- Only one dominant hydrological unit, which is where flows are non-channelised and slowly move through the vegetation. No pools or open sections of channel observed
- Classified as an exotic wetland by project ecologists
- Dominated by exotic species
- Stock damage evident through pugging and grazing
- Increase sedimentation and reduced water quality
- No riparian buffer (pines) to the north and no buffer to the south. Occasional tree ferns present.
- No threatened or at risk flora or fauna species
- Does not provide habitat for long-fin eels

Experiential

Low

- Highly modified from its original vegetation which will have been a form of wetland forest such as Kahikatea and, pukatea forest.
- Indirect human effects through stock access

Appendix 3: Graphic Supplement – Maps and Viewpoint Photos

SUTTON BLOCK EXPANSION

GRAPHIC SUPPLEMENT - APPENDIX 3
MAPS AND VIEWPOINT PHOTOGRAPHS

MARCH 2025



Sutton Block Expansion



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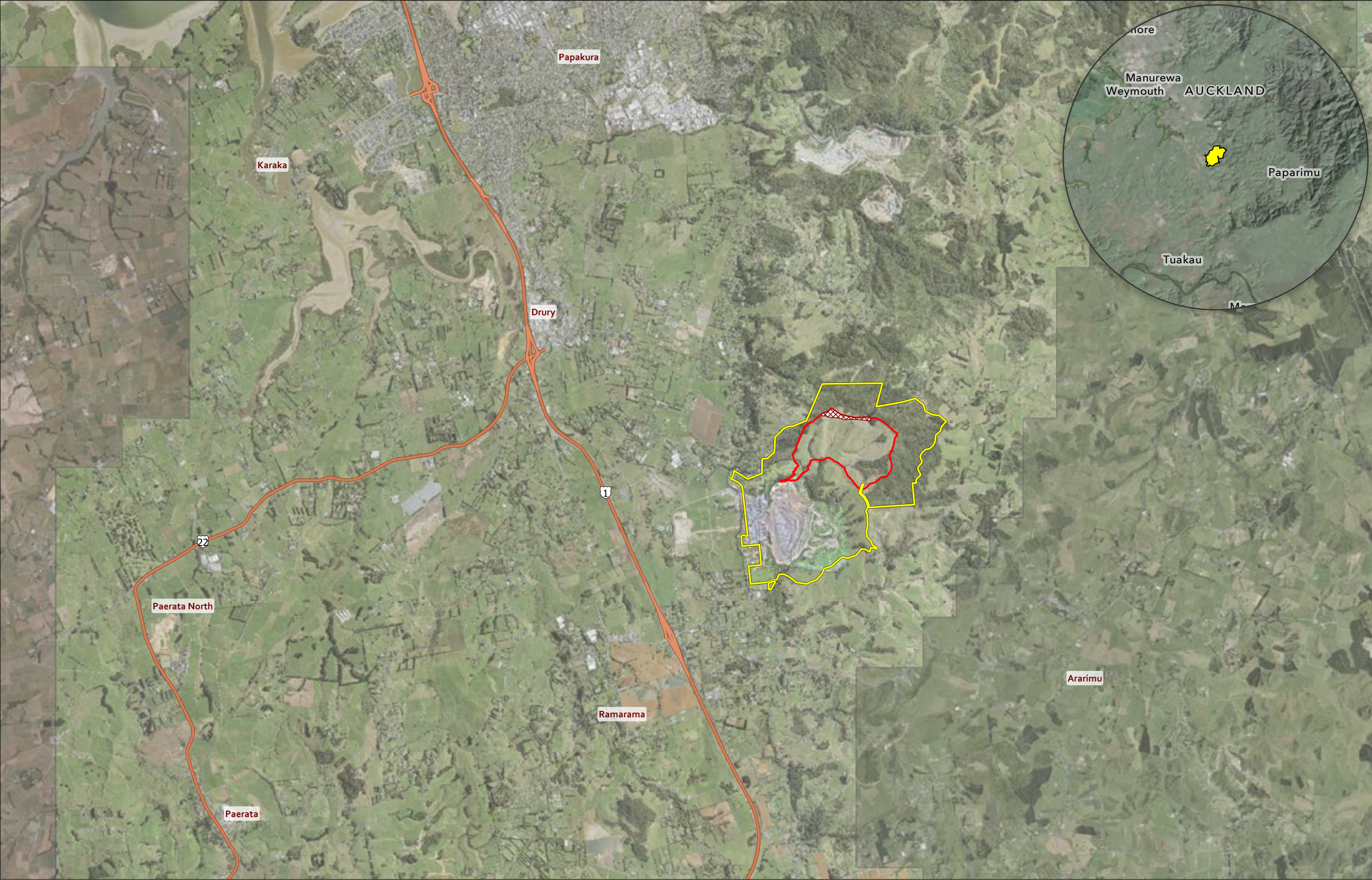
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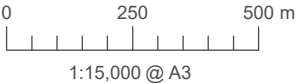
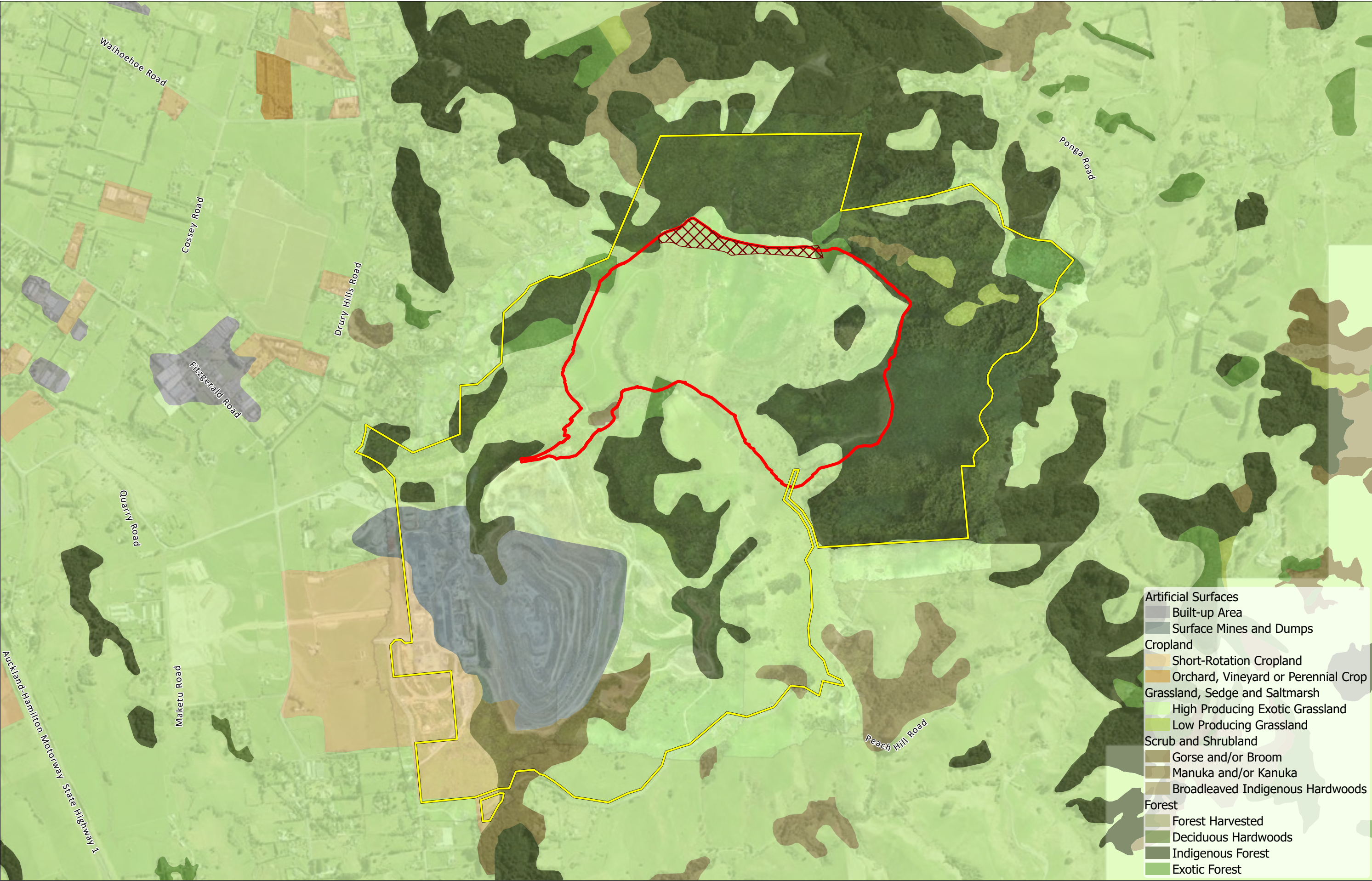


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VIEWPOINT PHOTOGRAPHS

VP 1:	View from Macwhinney Drive (1/2)
VP 2:	View from Macwhinney Drive (2/2)
VP 3:	View from Fitzgerald Road
VP 4:	View from Maketu Road
VP 5:	View from John Main Drive
VP 6:	View from Ararimu Road
VP 7:	View from Peach Hill Road (1/2)
VP 8:	View from Hiwinui Road
VP 9:	View from Great South Road (1/2)
VP 10:	View from Great South Road (2/2)
VP 11:	View from Sonja Drive
VP 12:	View from Laurie Drive
VP 13:	View from SH1
VP 14:	View from Peach Hill Road (2/2)
VP 15:	View from Otto Road
VP 16:	View from Pratts Road





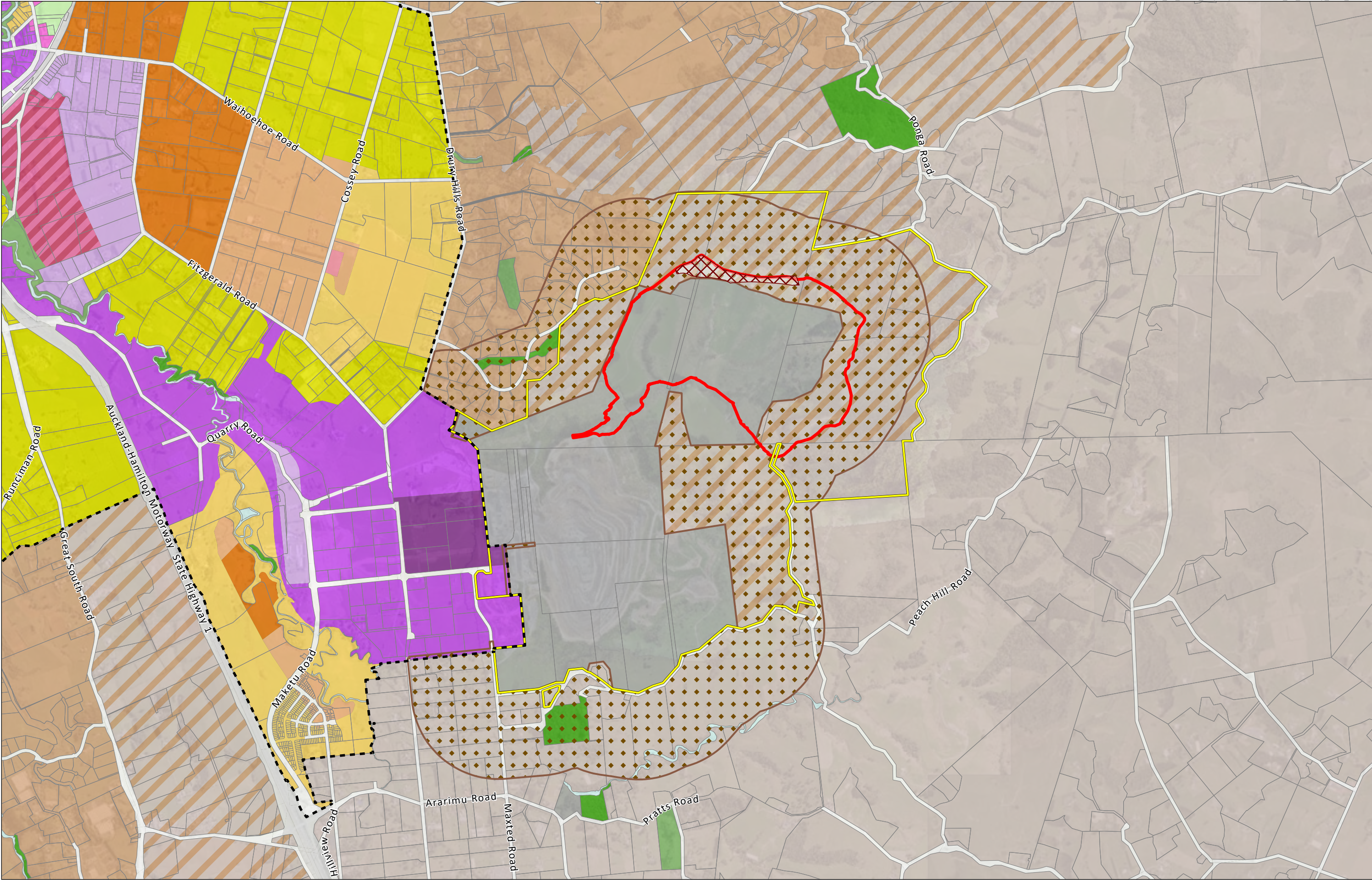
LEGEND

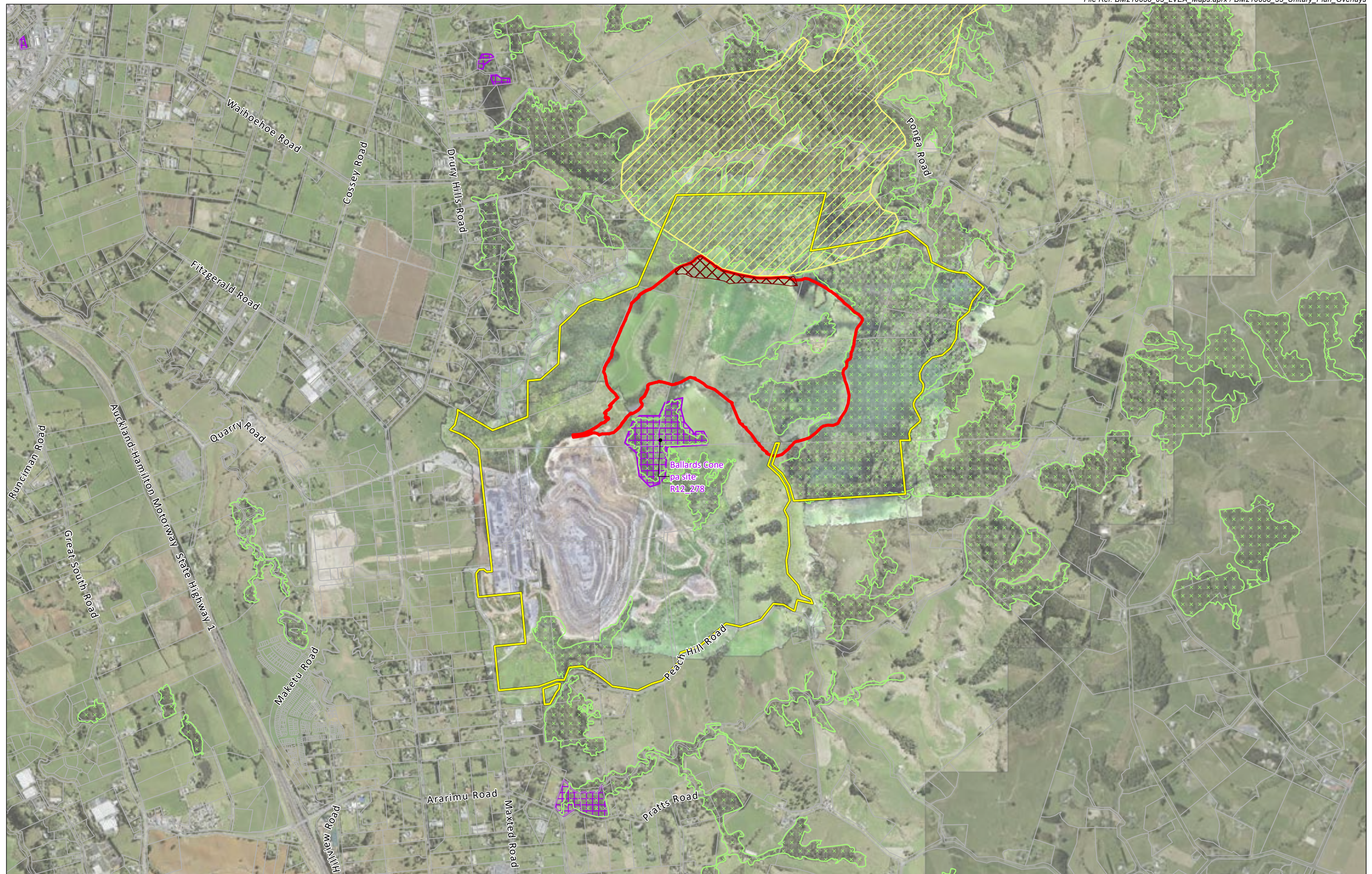
- Property Boundary
- Stage 5 LOQ Boundary
- Northern Bund

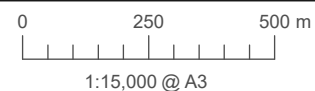
DRURY QUARRY

Landcover

Figure 2







LEGEND

- Property Boundary
- Stage 5 LOQ Boundary
- Northern Bund
- Land Parcels
- Public Open Space

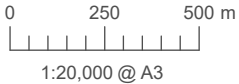
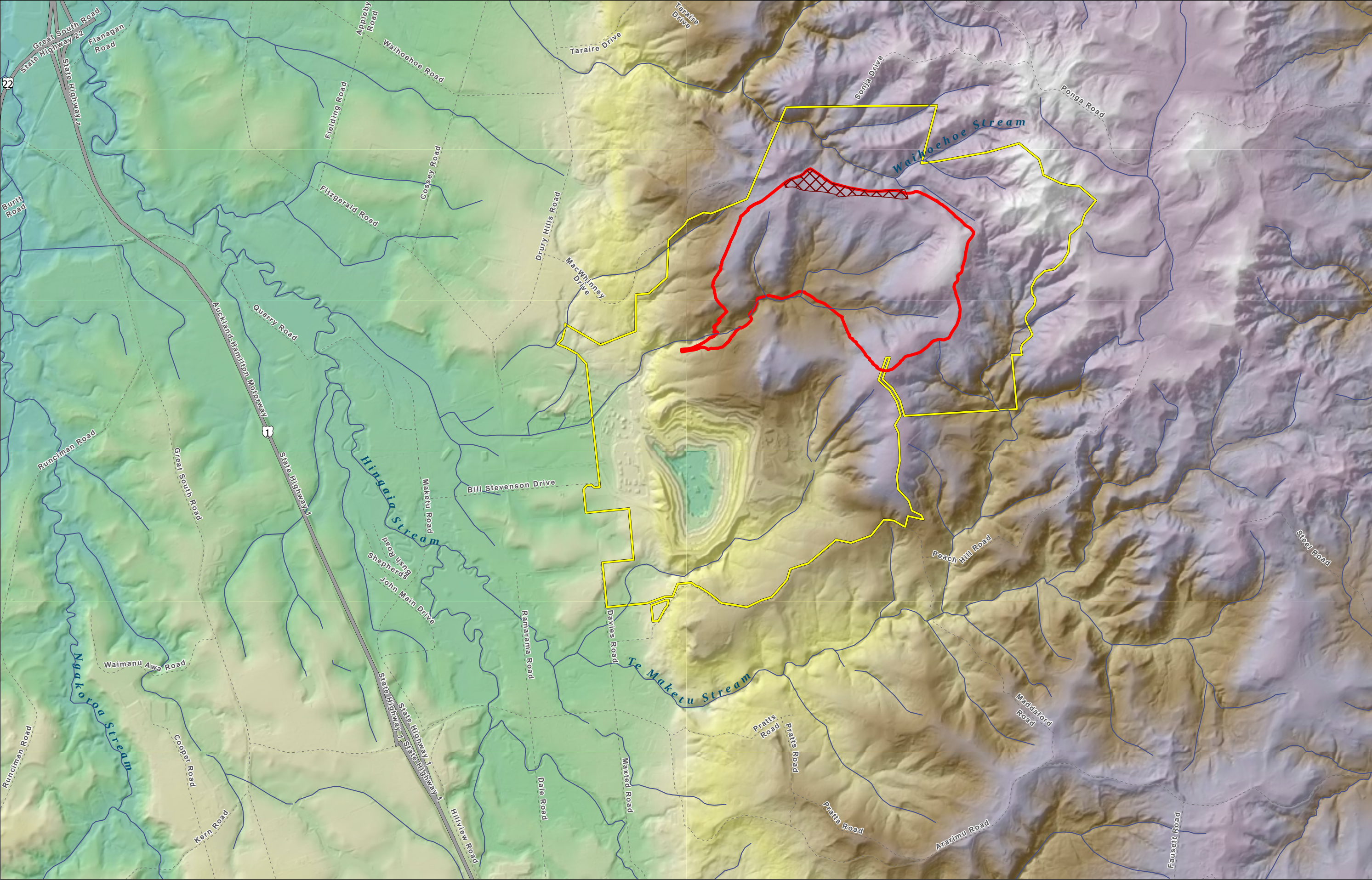
DRURY QUARRY
Site Location

Date: 17 December 2024 | Revision: A

Plan prepared by Boffa Miskell Limited

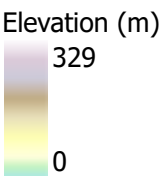
Project Manager: Tom.Lines@boffamiskell.co.nz | Drawn: SGa | Checked: TLI

Figure 5



LEGEND

-  Property Boundary
-  Stage 5 LOQ Boundary
-  Northern Bund
-  Streams



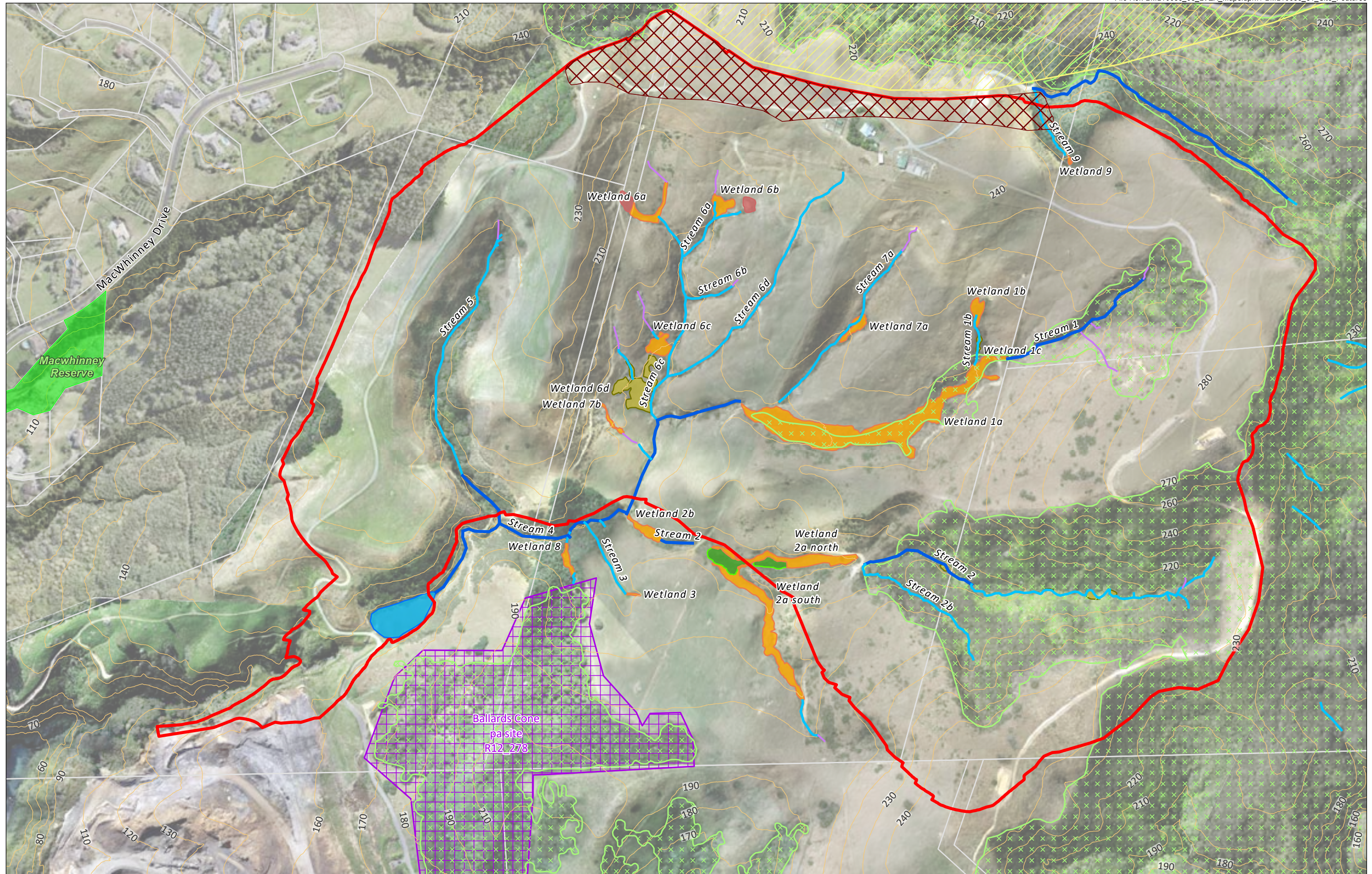
DRURY QUARRY
Elevation and Streams

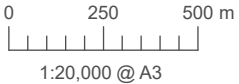
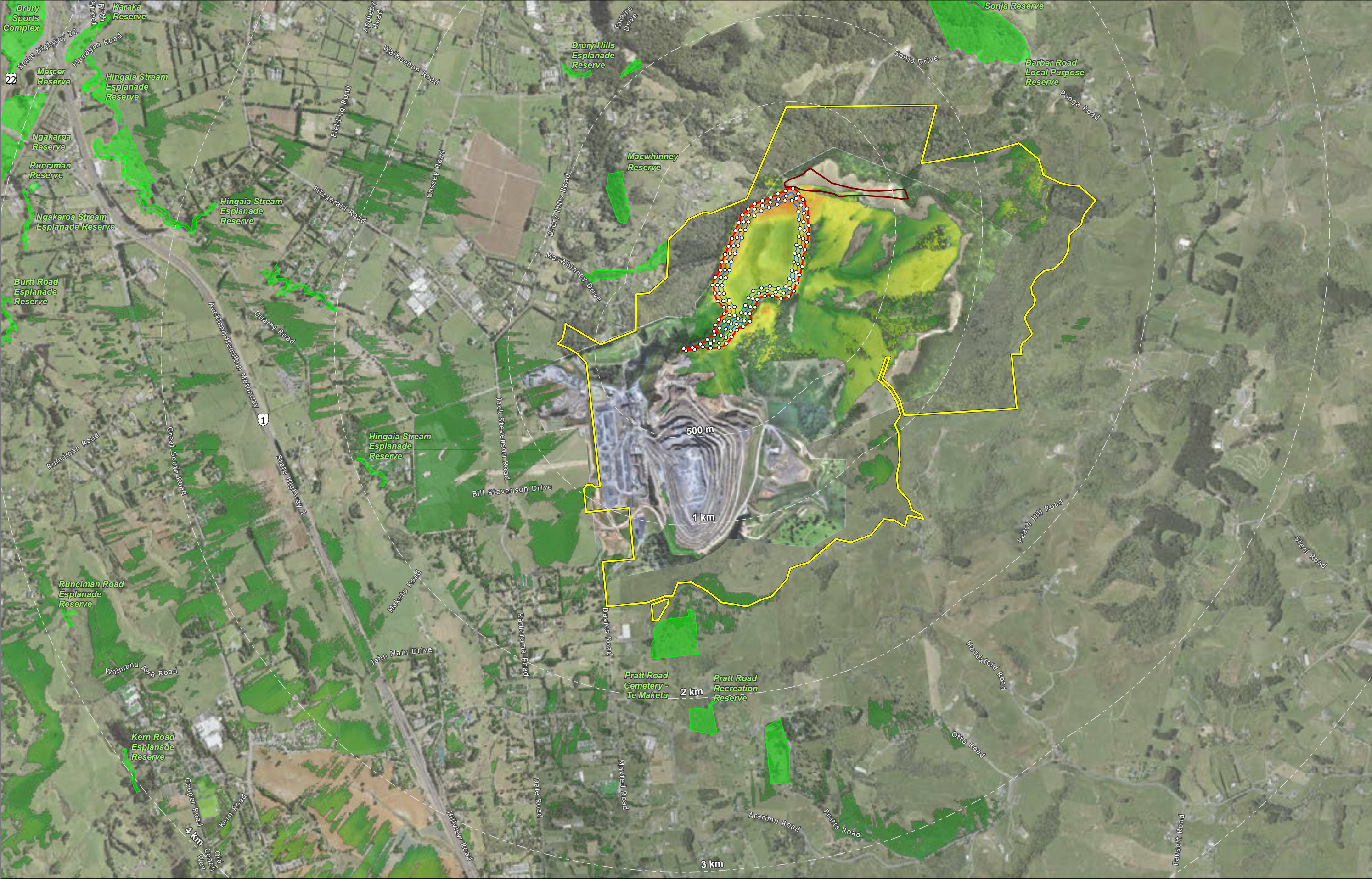
Date: 18 December 2024 | Revision: A

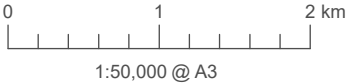
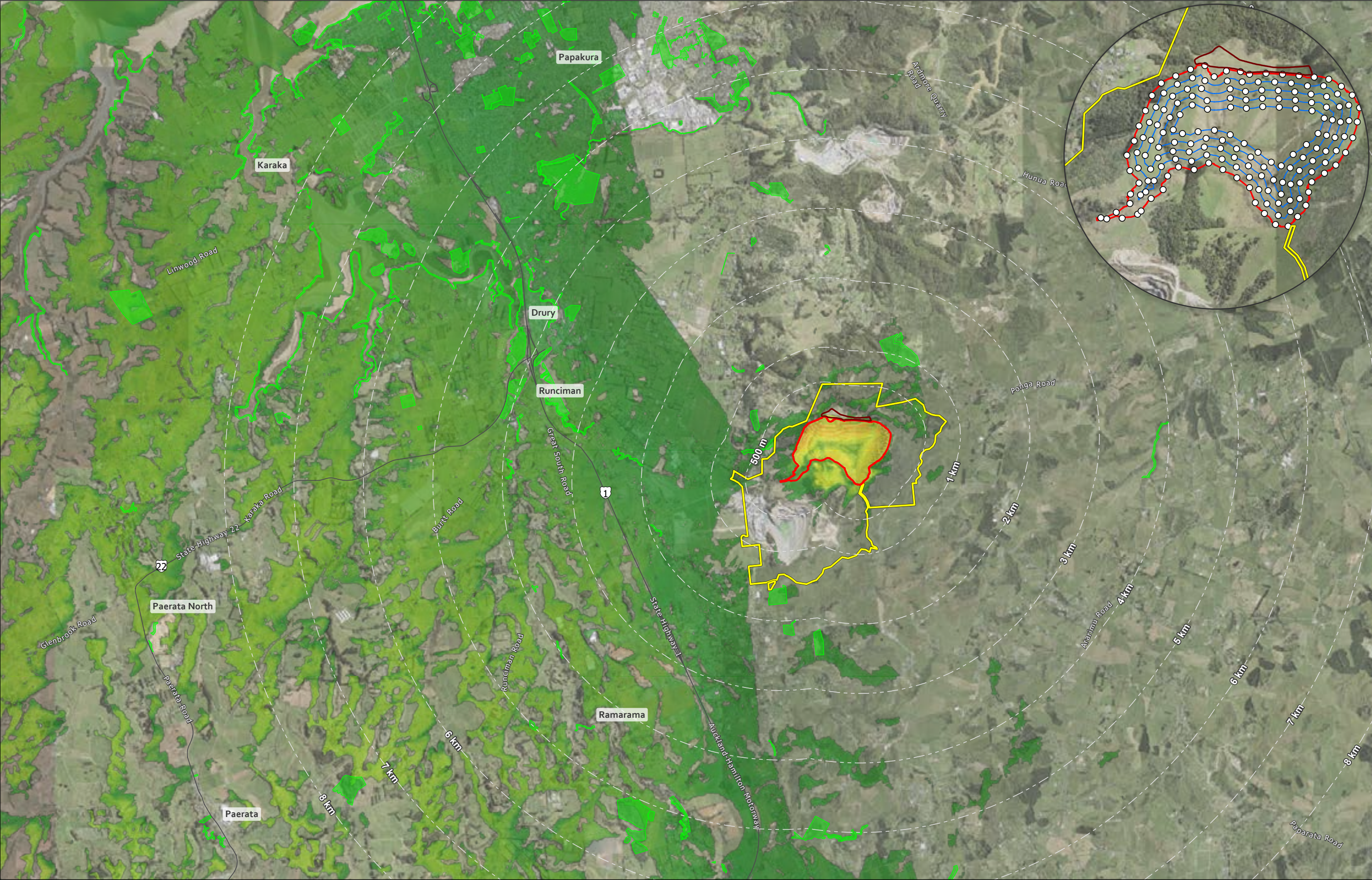
Plan prepared by Boffa Miskell Limited

Project Manager: Tom.Lines@boffamiskell.co.nz | Drawn: SGa | Checked: TLI

Figure 6

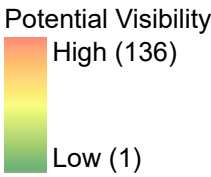




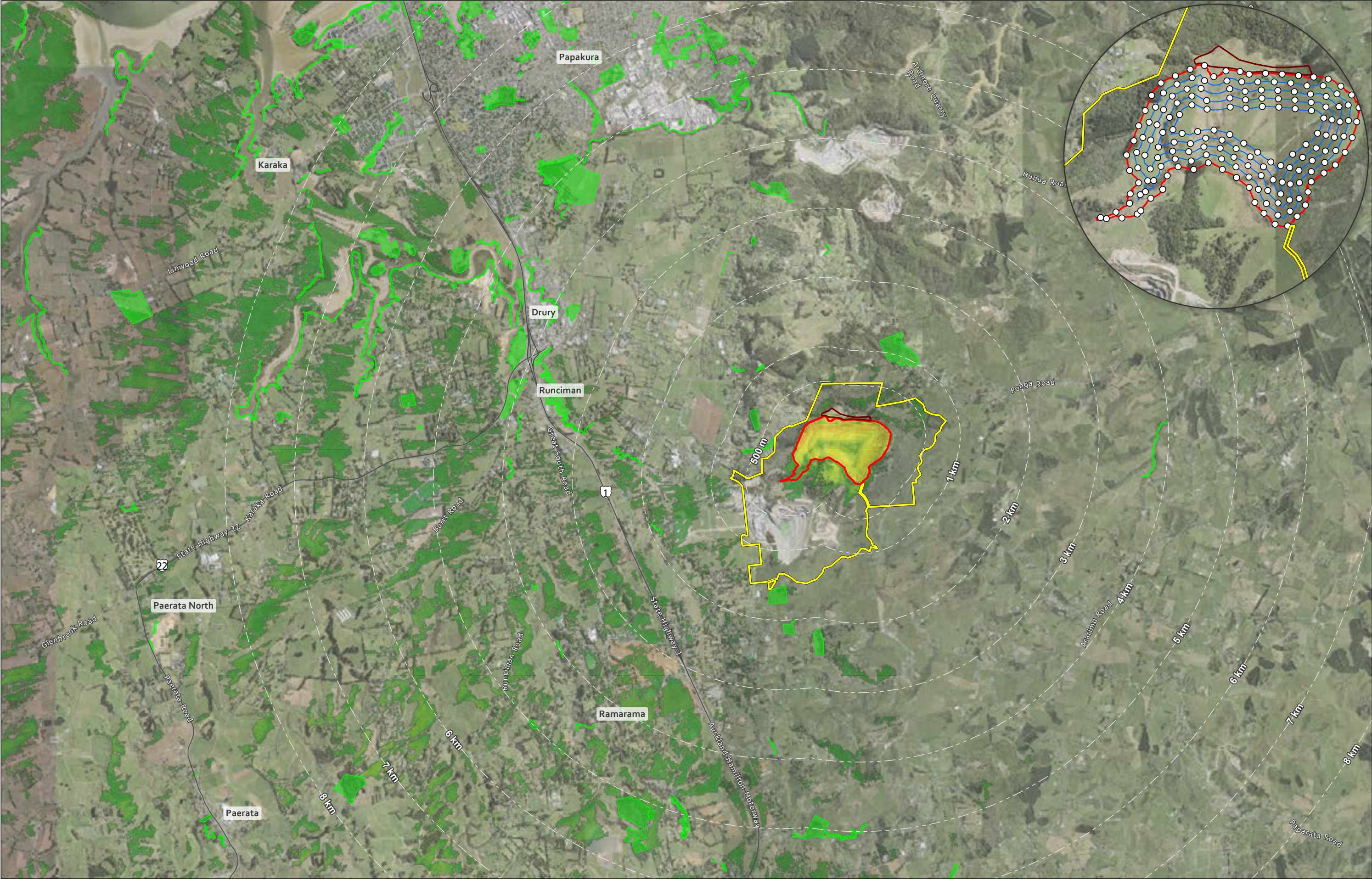


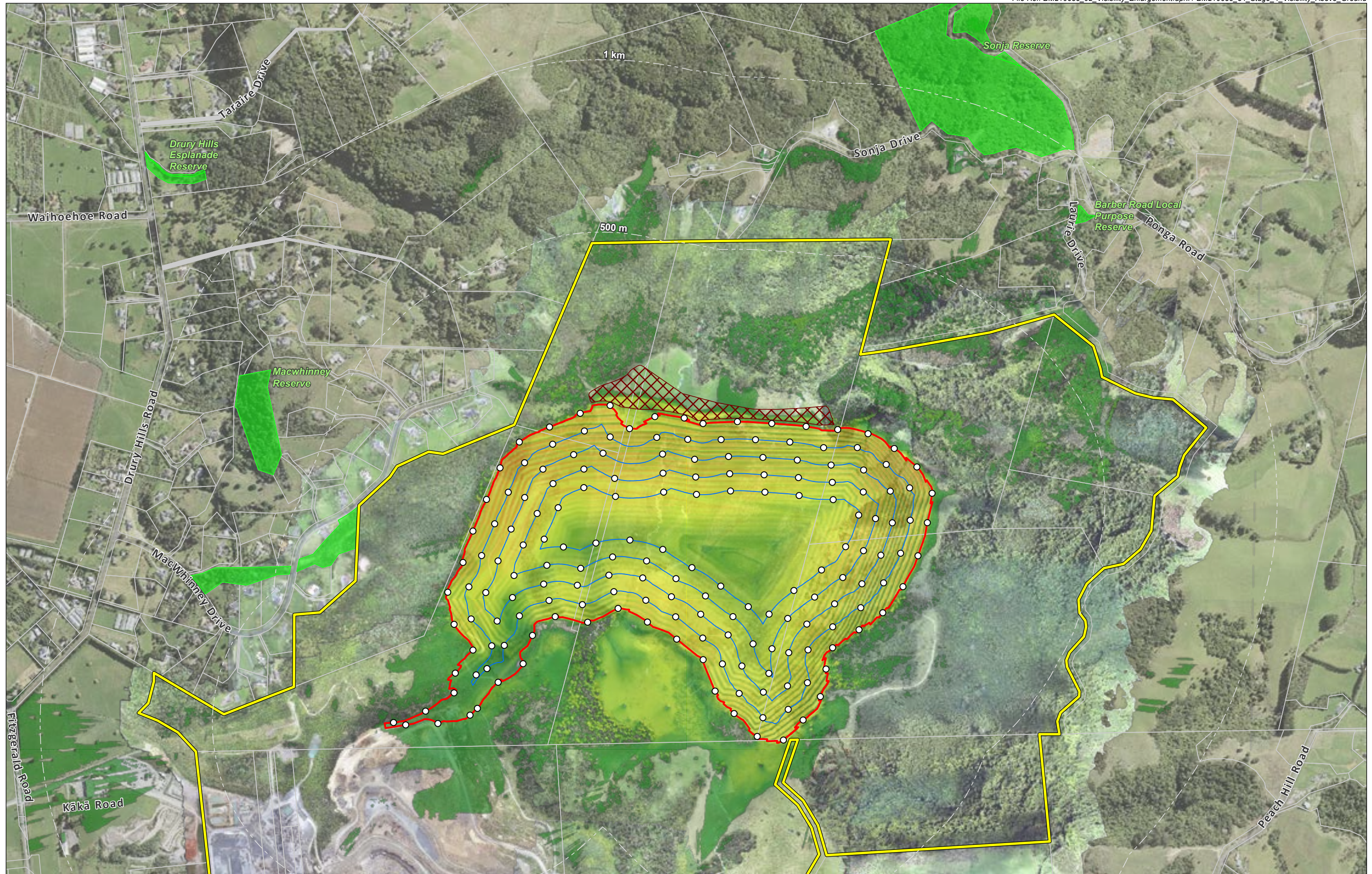
LEGEND

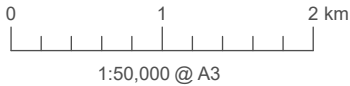
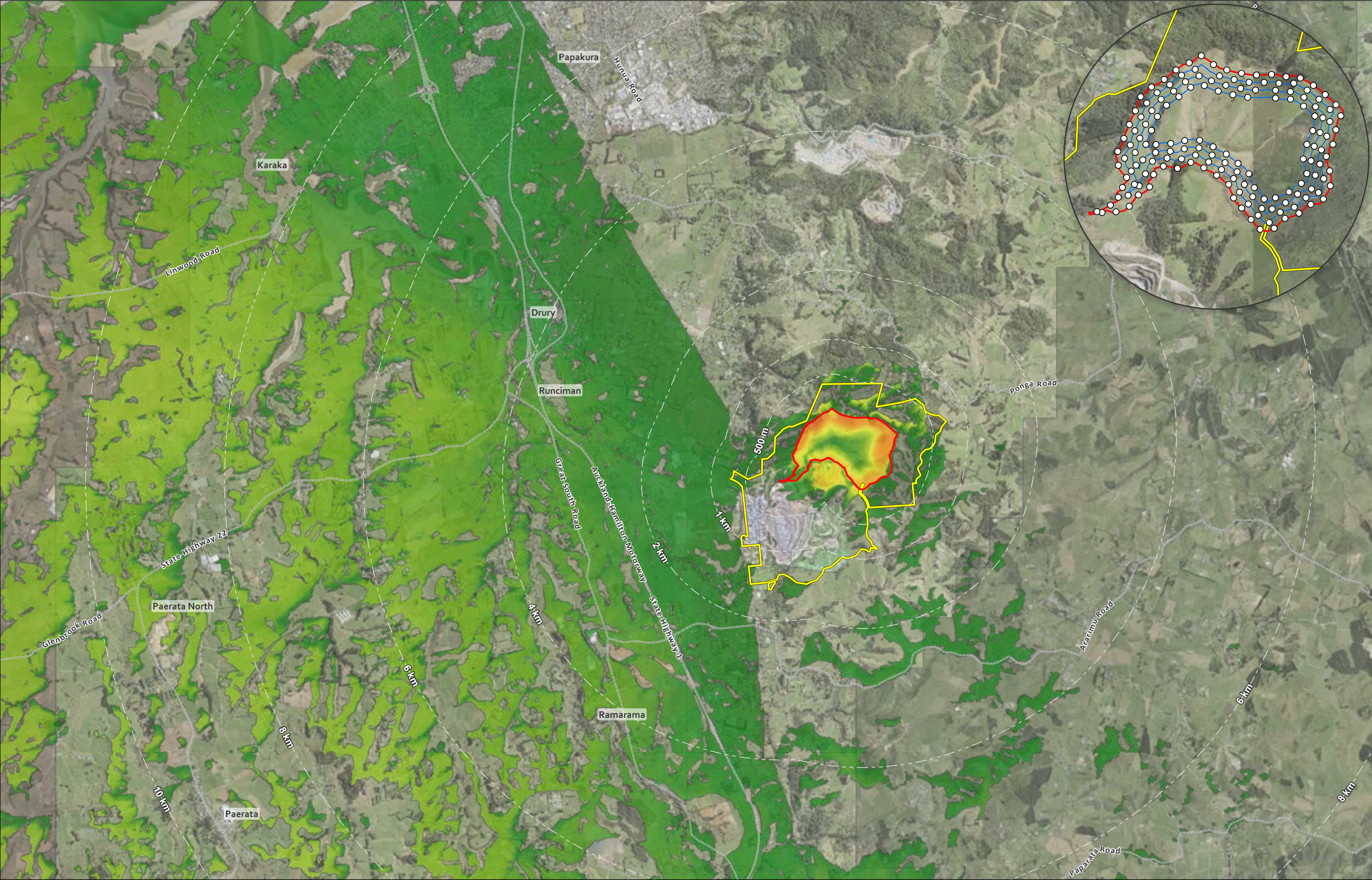
- Property Boundary
- Stage 4 Boundary
- 176 Observable Points (100m apart)
- Internal Buffer (20m)



- Northern Bund
- Public Open Space

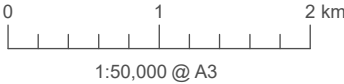
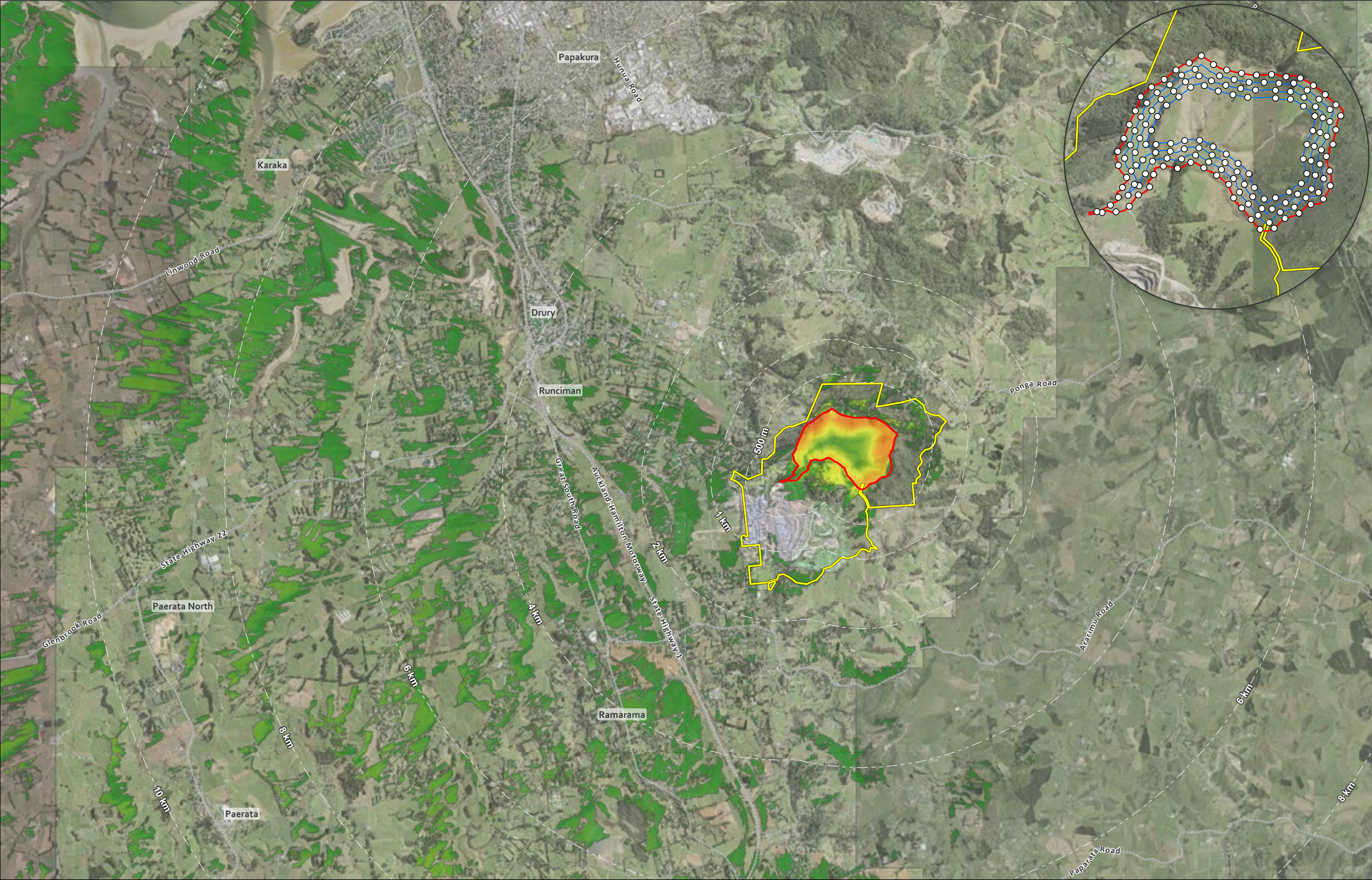






LEGEND

- Property Boundary
- Stage 5 LOQ Boundary
- 164 Observable Points (100m apart)
- Internal Buffer (50m)
- Potential Visibility
- High (120)
- Low (1)



LEGEND

- Property Boundary
- Stage 5 LOQ Boundary
- 164 Observable Points (100m apart)
- Internal Buffer (50m)
- Potential Visibility
 - High (124)
 - Low (1)

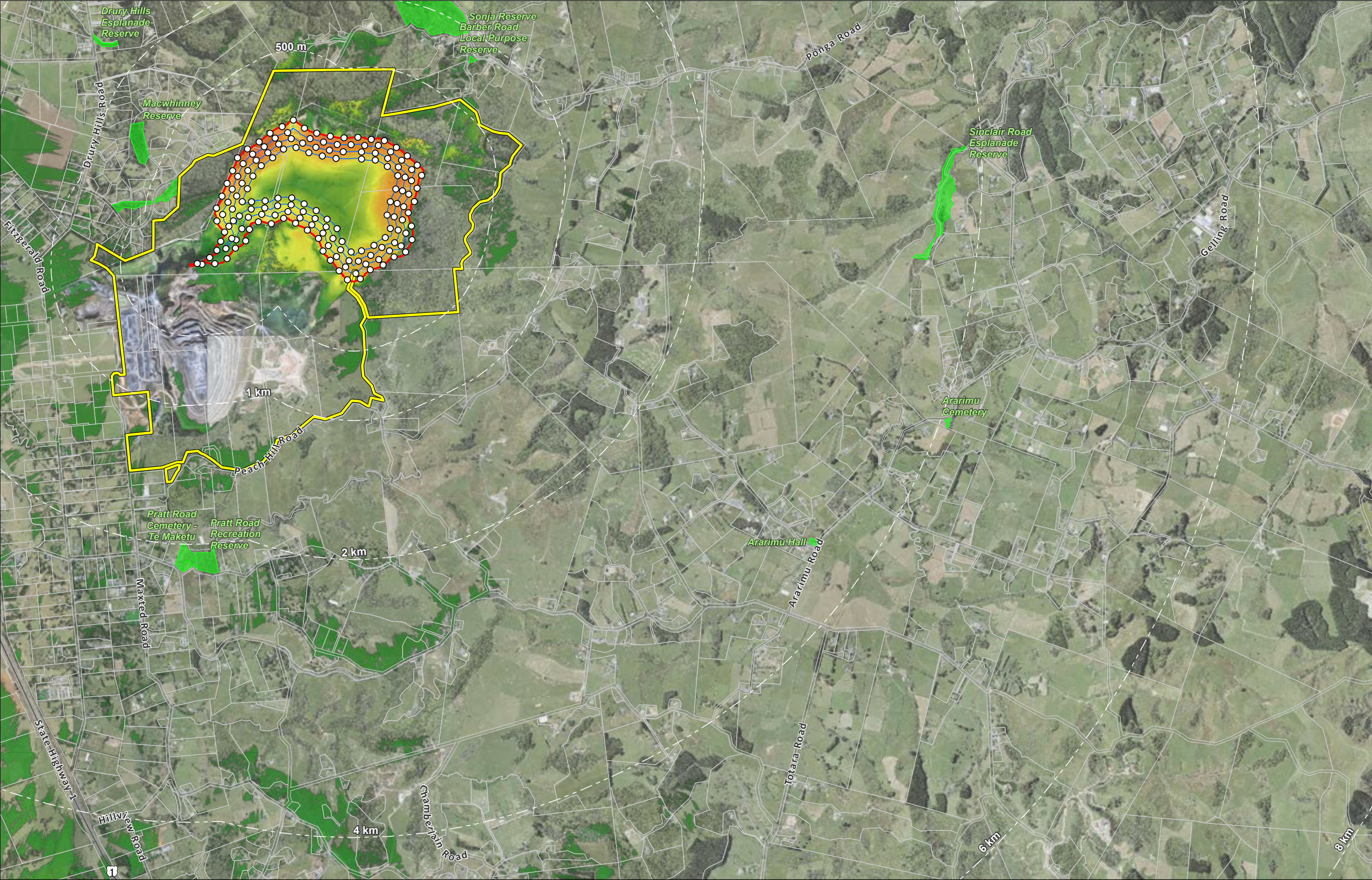
DRURY QUARRY
Stage 5 Visibility (Above-Ground)

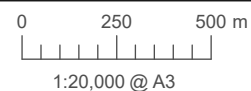
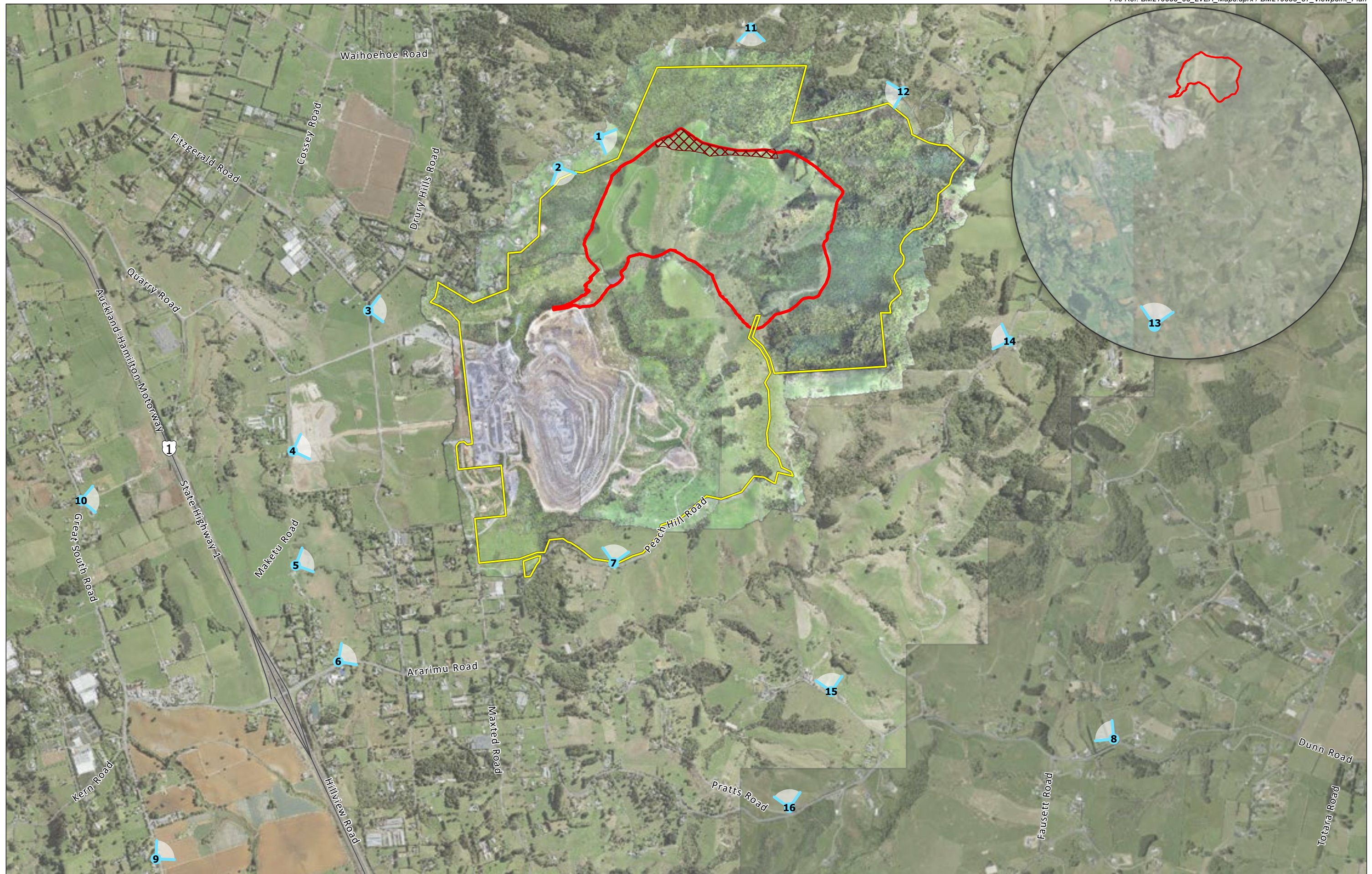
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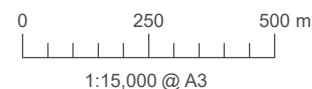
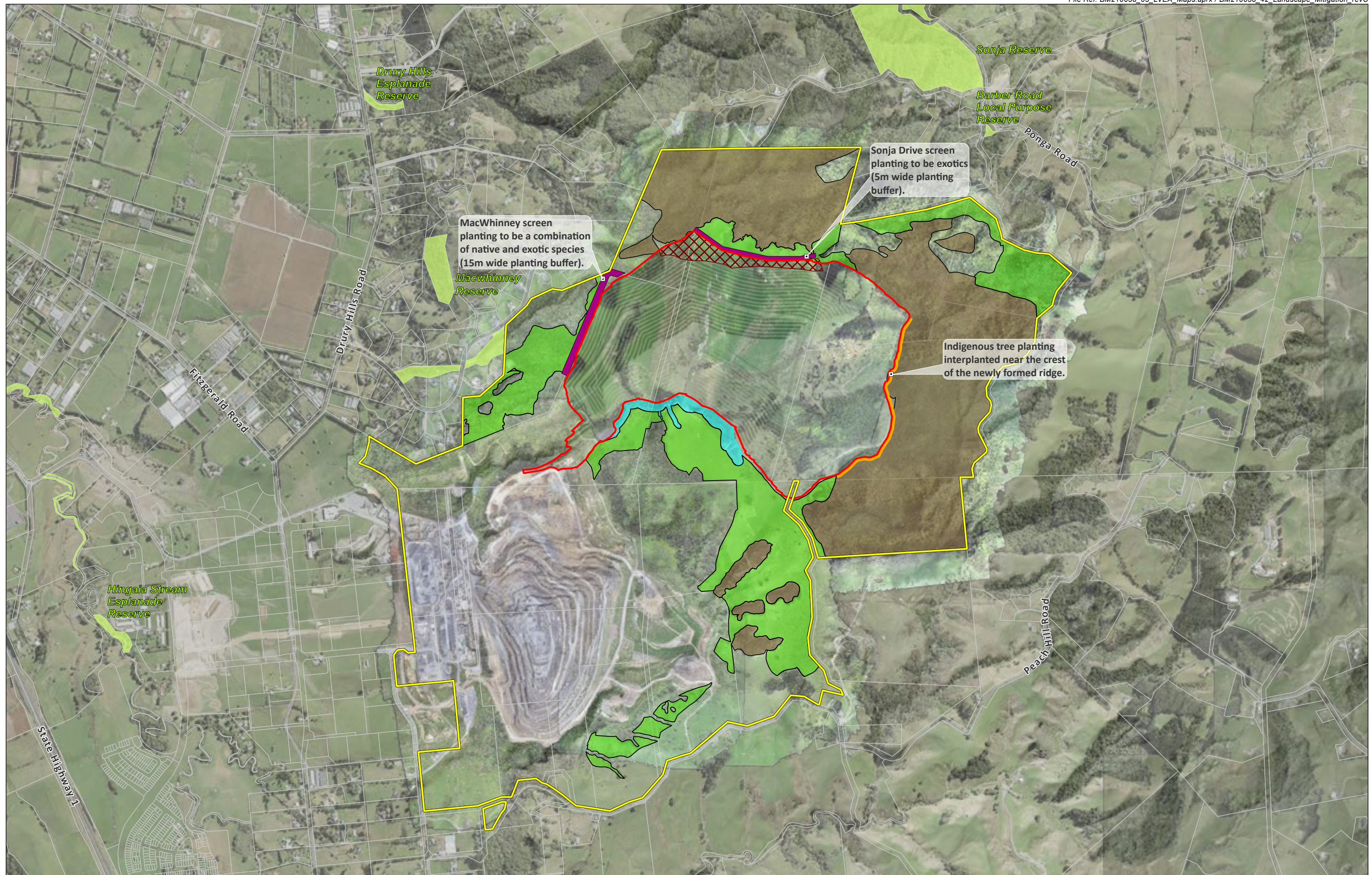
Plan prepared by Boffa Miskell Limited

Project Manager: Tom.Lines@boffamiskell.co.nz | Drawn: SGa | Checked: TLI

Figure 14







LEGEND		Property Boundary		Indigenous Tree Planting
		Stage 5 LOQ Boundary		Riparian Planting
		Screen Planting Mitigation		Northern Bund
		Ecological Mitigation		Public Open Space
		Revegetation		Land Parcels
		Enhancement		



Existing Photo SA 1 - View of Quarry Expansion Site from West



Existing Photo SA 2 - View of Quarry Expansion Site from North-West



Existing Photo SA 3 - View of Quarry Expansion Site from North



Existing Photo SA 4 - View of Quarry Expansion Site from North-East



Existing Photo SA 5 - View of Pines between Quarry Expansion and Macwhinney Drive



Existing View



Existing View



Existing View



Existing View



Existing View



Existing View



Existing View



Existing View



Existing View



Existing View



Existing View



Existing View





Existing View



Existing View



Existing View

Appendix 4: Graphic Supplement – Visual Simulations

SUTTON BLOCK EXPANSION

VISUAL SIMULATIONS - APPENDIX 4:

MARCH 2025



Sutton Block Expansion



Contents

FIGURES

- FIGURE 1: Viewpoint plan
FIGURE 2 Methodology - Visual Simulations

VISUAL SIMULATIONS

- VS 1A: View from MacWhinney Drive - Panorama (Existing vs Proposed View Stage 2 - 15 Years)
VS 1B: View from MacWhinney Drive - Panorama (Proposed View Stage 2 - 15 Years vs Proposed View Stage 4 - 40 Years)
VS 1C: View from MacWhinney Drive - Panorama (Proposed View Stage 4 - 40 Years vs Proposed View Stage 5 - 50 Years)
VS 1D: View from MacWhinney Drive - Single Frame (Existing)
VS 1E: View from MacWhinney Drive - Single Frame (Proposed View Stage 2 - 15 Years)
VS 1F: View from MacWhinney Drive - Single Frame (Proposed View Stage 4 - 40 Years)
VS 1G: View from MacWhinney Drive - Single Frame (Proposed View Stage 5 - 50 Years)
- VS 6A: View from Ararimu Road - Panorama (Existing vs Proposed View Stage 2 - 15 Years)
VS 6B: View from Ararimu Road - Panorama (Proposed View Stage 2 - 15 Years) vs Proposed View Stage 4 - 40 Years)
VS 6C: View from Ararimu Road - Panorama (Proposed View Stage 4 - 40 Years vs Proposed View Stage 5 - 50 Years)
VS 6D: View from Ararimu Road - Single Frame (Existing)
VS 6E: View from Ararimu Road - Single Frame (Proposed View Stage 2 - 15 Years)
VS 6F: View from Ararimu Road - Single Frame (Proposed View Stage 4 - 40 Years)
VS 6G: View from Ararimu Road - Single Frame (Proposed View Stage 5 - 50 Years)
- VS 9A: View from Great South Road (1/2) - Panorama (Existing vs Proposed View Stage 2 - 15 Years)
VS 9B: View from Great South Road (1/2) - (Proposed View Stage 2 - 15 Years) vs Proposed View Stage 4 - 40 Years)
VS 9C: View from Great South Road (1/2) - (Proposed View Stage 4 - 40 Years) vs Proposed View Stage 5 - 50 Years)
VS 9D: View from Great South Road (1/2) - Single Frame (Existing)
VS 9E: View from Great South Road (1/2) - Single Frame (Proposed View Stage 2 - 15 Years)
VS 9F: View from Great South Road (1/2) - Single Frame (Proposed View Stage 4 - 40 Years)
VS 9G: View from Great South Road (1/2) - Single Frame (Proposed View Stage 5 - 50 Years)

Sutton Block Expansion



Contents continued...

VISUAL SIMULATIONS

VS 11A:	View from Sonja Drive - Panorama (Existing vs Proposed View Stage 2 - 15 Years)
VS 11B:	View from Sonja Drive - Panorama (Proposed View Stage 2 - 15 Years vs Proposed View Stage 4 - 40 Years)
VS 11C:	View from Sonja Drive - Panorama (Proposed View Stage 4 - 40 Years vs Proposed View Stage 5 - 50 Years)
VS 11D:	View from Sonja Drive - Single Frame (Existing)
VS 11E:	View from Sonja Drive - Single Frame (Proposed View Stage 2 - 15 Years)
VS 11F:	View from Sonja Drive - Single Frame (Proposed View Stage 4 - 40 Years)
VS 11G:	View from Sonja Drive - Single Frame (Proposed View Stage 5 - 50 years)
VS 13A:	View from State Highway 1 - Single Frame (Existing View)
VS 13B:	View from State Highway 1 - Single Frame (Proposed View Stage 2 - 15 Years)
VS 13C:	View from State Highway 1 - Single Frame (Proposed View Stage 4 - 40 years)
VS 13D:	View from State Highway 1 - Single Frame (Proposed View Stage 5 - 50 years)
VS 14A:	View from Peach Hill - Panorama (Existing vs Proposed View Stage 2 - 15 Years)
VS 14B:	View from Peach Hill - Panorama (Proposed View Stage 2 - 15 Years vs Proposed View Stage 4 - 40 Years)
VS 14C:	View from Peach Hill - Panorama (Proposed View Stage 4 - 40 Years vs Proposed View Stage 5 - 50 Years)
VS 14D:	View from Peach Hill - Single Frame (Existing View)
VS 14E:	View from Peach Hill - Single Frame (Proposed View Stage 2 - 15 Years)
VS 14F:	View from Peach Hill - Single Frame (Proposed View Stage 4 - 40 Years)
VS 14G:	View from Peach Hill - Single Frame (Proposed View Stage 5 - 50 Years)
VS 15A:	View from Otto Road - Panorama (Existing vs Proposed View Stage 2 - 15 Years)
VS 15B:	View from Otto Road - Panorama (Proposed View Stage 2 - 15 Years vs Proposed View Stage 4 - 40 Years)
VS 15C:	View from Otto Road - Panorama (Proposed View Stage 4 - 40 Years vs Proposed View Stage 5 - 50 Years)
VS 15D:	View from Otto Road - Single Frame (Existing View)
VS 15E:	View from Otto Road - Single Frame (Proposed View Stage 2 - 15 Years)
VS 15F:	View from Otto Road - Single Frame (Proposed View Stage 4 - 40 Years)
VS 15G:	View from Otto Road - Single Frame (Proposed View Stage 5 - 50 Years)

Sutton Block Expansion



Contents continued...

VISUAL SIMULATIONS

VS 16A:	View from Pratts Road - Panorama (Existing vs Proposed View Stage 2 - 15 Years)
VS 16B:	View from Pratts Road - Panorama (Proposed View Stage 2 - 15 Years vs Proposed View Stage 4 - 40 Years)
VS 16C:	View from Pratts Road - Panorama - (Proposed View Stage 4 - 40 Years vs Proposed View Stage 5 - 50 Years)
VS 16D:	View from Pratts Road - Single Frame (Existing View)
VS 16E:	View from Pratts Road - Single Frame (Proposed View Stage 2 - 15 Years)
VS 16F:	View from Pratts Road - Single Frame (Proposed View Stage 4 - 40 Years)
VS 16G:	View from Pratts Road - Single Frame (Proposed View Stage 5 - 50 Years)



VISUALISATIONS - METHODOLOGY

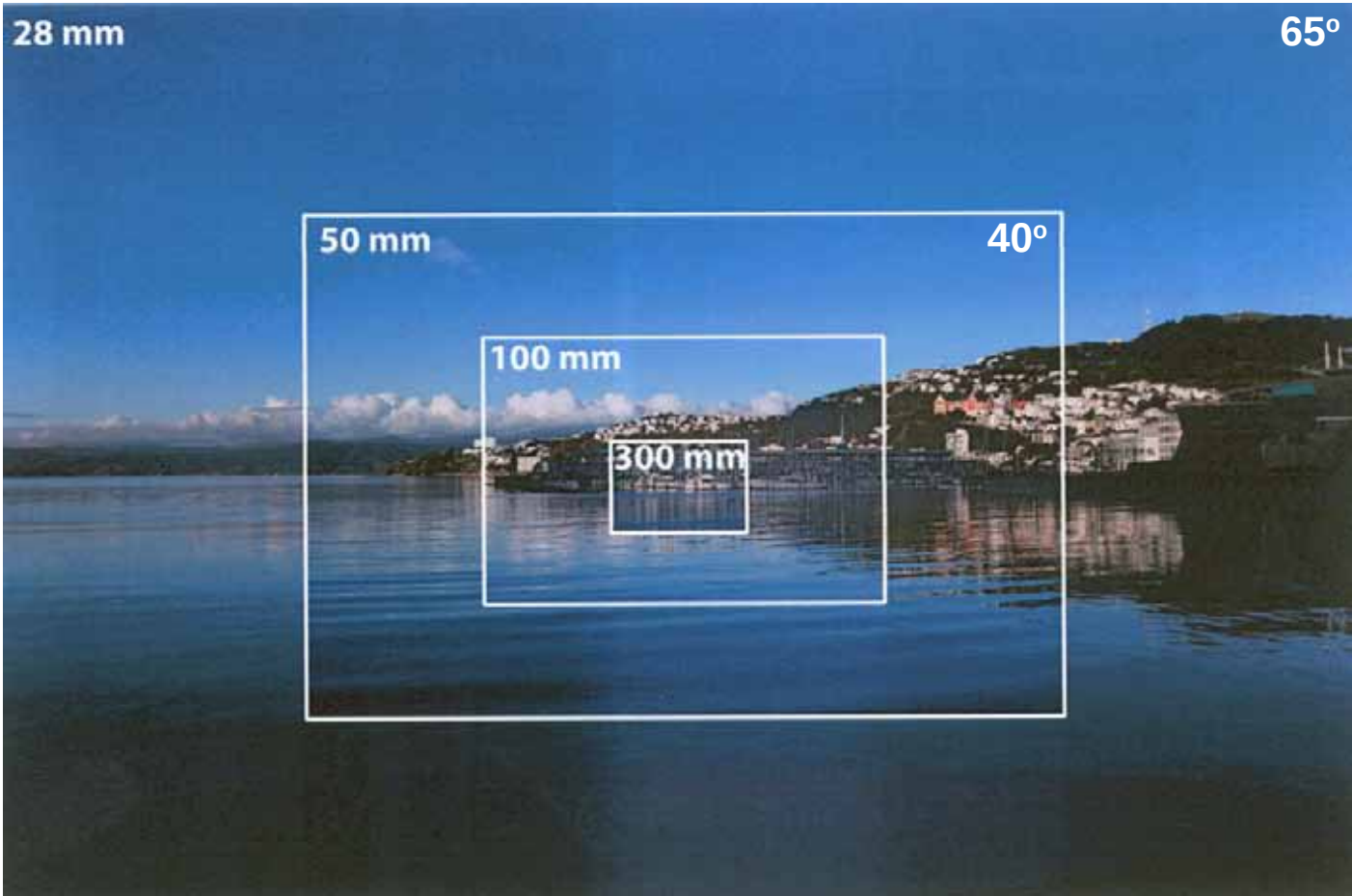
SITE VISIT & PHOTOGRAPHY

Site photographs were taken with a Canon digital SLR camera fitted with a 50mm focal length lens, mounted on a tripod and panoramic head. A series of photos were taken at predetermined viewpoints, situated on public land. The locations of each viewpoint were fixed using a Canon EOS 6D in-built GPS and EMLID Reach 2 GPS Rover Unit.

NZILA GUIDELINES & PANORAMA PREPARATION

The visualisations have been produced in accordance with the NZILA Best Practice Guidelines for Visual Simulations (BPG 10.2) and also adhere to Boffa Miskell's internal Visualisation Guidelines.

Camera lenses with different focal lengths capture images with differing fields of view. As can be seen below (derived from Fig 9 of the NZILA BPG), a photo taken with a 28mm lens provides a horizontal field of view of 65°. A 50mm lens will provide a cropped (40°) version of the same view. So panoramas can be created by taking multiple 28mm or 50mm photos (in “portrait” mode), and using digital stitching software to merge and crop to create a single panorama. The panoramas used in these visualisations have a field of view of 90°.

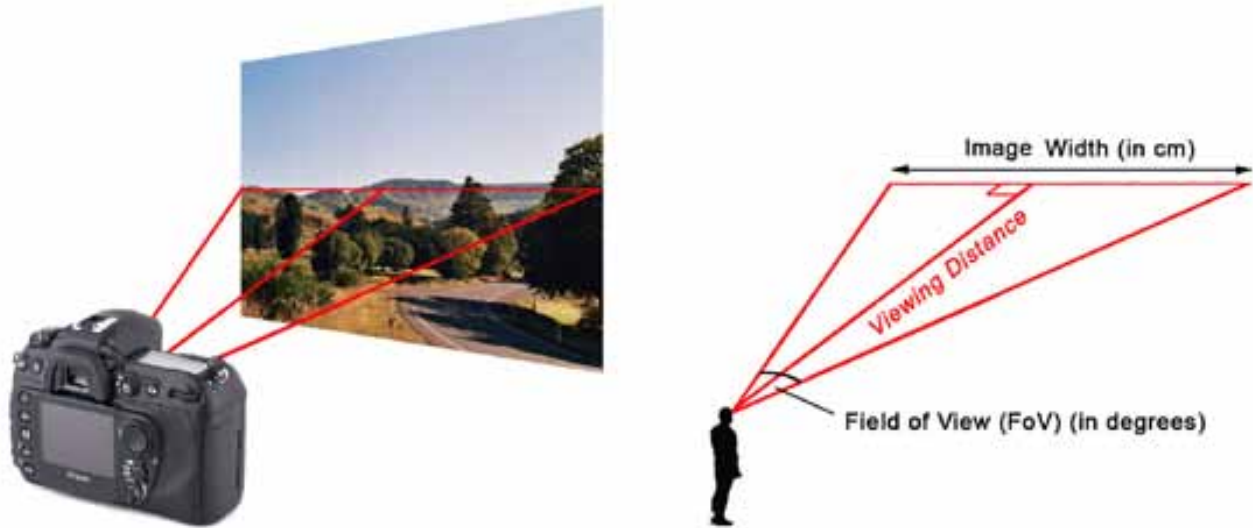


3D MODELLING

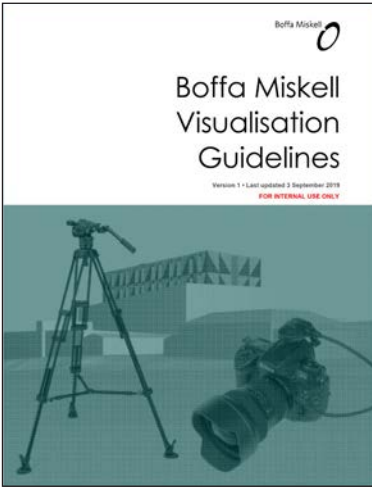
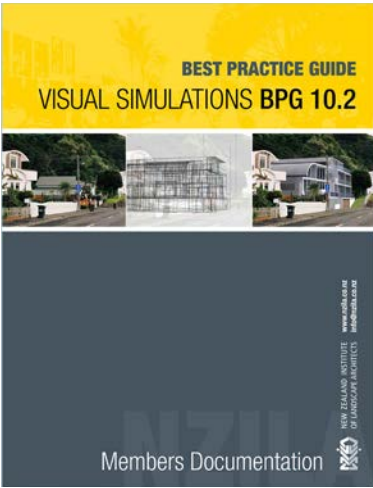
Virtual camera views were then created in 3D modelling software, and 3D terrain data and architectural modelling were imported. These views were then registered over the corresponding photographic panorama, using identifiable features in the landscape and the characteristics of the camera to match the two together. The visualisations were then assembled using graphic design software.

IMAGE READING DISTANCES

These visualisations have a field of view of 90° and so should be viewed from a distance of 20 cm when printed at A3. This will ensure that each simulation is viewed as if standing on-site at the actual camera location, and is in accordance with Section 7.11 of the NZILA BPG. Users are encouraged to print these pages on A3 transparency, go to the viewpoint and hold at the specified reading distance in order to verify the methodology.



Geometry of Image Reading Distance





Existing View - Panorama



Proposed View Stage 2 (15 Years) - Panorama



Proposed View Stage 2 (15 Years) - Panorama



Proposed View Stage 4 (40 Years) - Panorama



Proposed View Stage 4 (40 Years) - Panorama



Proposed View Stage 5 (50 Years) - Panorama



Existing View - Single Frame



Proposed View Stage 2 (15 Years) - Single Frame



Proposed View Stage 4 (40 Years) - Single Frame



Proposed View Stage 5 (50 Years) - Single Frame



Existing View - Panorama



Proposed View Stage 2 (15 Years) - Panorama



Proposed View Stage 2 (15 Years) - Panorama



Proposed View Stage 4 (40 Years) - Panorama



Proposed View Stage 4 (40 Years) - Panorama



Proposed View Stage 5 (50 Years) - Panorama



Existing View - Single Frame



Proposed View Stage 2 (15 Years) - Single Frame



Proposed View Stage 4 (40 Years) - Single Frame



Proposed View Stage 5 (50 Years) - Single Frame



Existing View - Panorama



Proposed View Stage 2 (15 Years) - Panorama



Proposed View Stage 2 (15 Years) - Panorama



Proposed View Stage 4 (40 Years) - Panorama



Proposed View Stage 4 (40 Years) - Panorama



Proposed View Stage 5 (50 Years) - Panorama



Existing View - Single Frame



Proposed View Stage 2 (15 Years) - Single Frame



Proposed View Stage 4 (40 Years) - Single Frame



Proposed View Stage 5 (50 Years) - Single Frame



Existing View - Panorama



Proposed View Stage 2 (15 Years) - Panorama



Proposed View Stage 2 (15 Years) - Panorama



Proposed View Stage 4 (40 Years) - Panorama



Proposed View Stage 4 (40 Years) - Panorama



Proposed View Stage 5 (50 Years) - Panorama



Existing View - Single Frame



Proposed View Stage 2 (15 Years) - Single Frame



Proposed View Stage 4 (40 Years) - Single Frame



Proposed View Stage 5 (50 Years) - Single Frame



Existing View - Single Frame



Proposed View Stage 2 (15 Years) - Single Frame



Proposed View Stage 4 (40 Years) - Single Frame



Proposed View Stage 5 (50 Years) - Single Frame



Existing View - Panorama



Proposed View Stage 2 (15 Years) - Panorama



Proposed View Stage 2 (15 Years) - Panorama



Proposed View Stage 4 (40 Years) - Panorama



Proposed View Stage 4 (40 Years) - Panorama



Proposed View Stage 5 (50 Years) - Panorama



Existing View - Single Frame



Proposed View Stage 2 (15 Years) - Single Frame



Proposed View Stage 4 (40 Years) - Single Frame



Proposed View Stage 5 (50 Years) - Single Frame



Existing View - Panorama



Proposed View Stage 2 (15 Years) - Panorama



Proposed View Stage 2 (15 Years) - Panorama



Proposed View Stage 4 (40 Years) - Panorama



Proposed View Stage 4 (40 Years) - Panorama



Proposed View Stage 5 (50 Years) - Panorama



Existing View - Single Frame



Proposed View Stage 2 (15 Years) - Single Frame



Proposed View Stage 4 (40 Years) - Single Frame



Proposed View Stage 5 (50 Years) - Single Frame



Existing View - Panorama



Proposed View Stage 2 (15 Years) - Panorama



Proposed View Stage 2 (15 Years) - Panorama



Proposed View Stage 4 (40 Years) - Panorama



Proposed View Stage 4 (40 Years) - Panorama



Proposed View Stage 5 (50 Years) - Panorama



Existing View - Single Frame



Proposed View Stage 2 (15 Years) - Single Frame



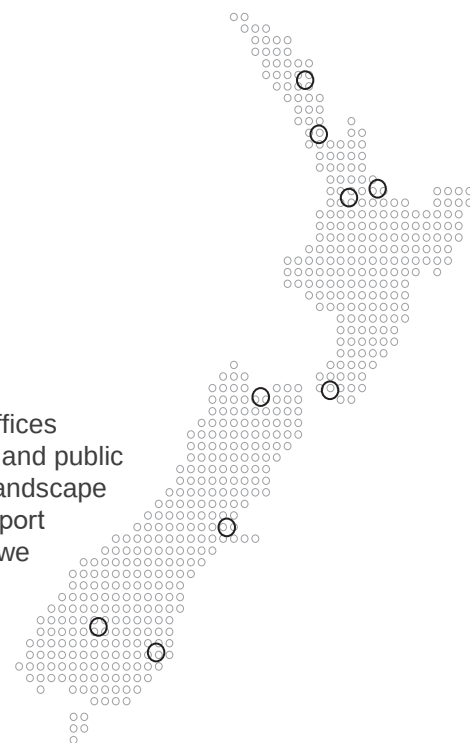
Proposed View Stage 4 (40 Years) - Single Frame



Proposed View Stage 5 (50 Years) - Single Frame

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Boffa Miskell is a leading New Zealand environmental consultancy with nine offices throughout Aotearoa. We work with a wide range of local, international private and public sector clients in the areas of planning, urban design, landscape architecture, landscape planning, ecology, biosecurity, Te Hīhiri (cultural advisory), engagement, transport advisory, climate change, graphics, and mapping. Over the past five decades we have built a reputation for creativity, professionalism, innovation, and excellence by understanding each project's interconnections with the wider environmental, social, cultural, and economic context.



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