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Watercourse assessment in Significant Natural Area

**Gleeson Huntly Quarry
Gleeson & Cox Ltd**

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Documentation

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Specialists in Ecological, Horticultural, Environmental & Civil work

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Table of Contents

| | |
|--|---|
| 1. Introduction | 1 |
| 2. Site context | 1 |
| 3. Description of SNA | 1 |
| Proposed Waikato District Plan showing location of proposed Aggregate Expansion Areas and SNA's | 2 |
| Site photographs | 3 |
| 4. Watercourse assessment | 4 |
| 4.1. Methods..... | 4 |
| 4.2. Results..... | 5 |
| 4.2.1. <i>Streams</i> | 5 |
| 4.2.2. <i>Wetlands</i> | 6 |
| Map of wetland and stream channels within SNA and proposed fill areas in Gleeson Huntly Quarry | 7 |
| 5. Discussion and recommendations | 8 |
| 6. References | 8 |

1. Introduction

Gleeson & Cox Ltd are proposing an expansion of the aggregate extraction area at Gleeson Huntly Quarry. The expansion will be within the Aggregate Extraction Area outlined in the Waikato District Plan and will involve the removal of rank pasture and vegetation to the west of the existing quarry pit. Envoco was engaged by Shawn McLean (Gleeson & Cox Ltd) to carry out an assessment of the watercourse present within a Significant Natural Area (SNA) (16971) that lies on the western boundary of the Aggregate Extraction Area. SNA's are classified based on criteria such as distinctiveness, rarity, presence of wetlands, and intactness of ecosystem function, and are legally protected under the Resource Management Act (1991).

The SNA in which the assessment was carried out is noted for its presence of wetlands and remnant gully forest, as well as its role in forming a part of an ecological sequence with nearby similar gullies across the landscape. Of interest to this assessment is delineating areas of permanent stream and natural wetland within the watercourse, which will inform the extent of future aggregate extraction and cleanfill works. National Environmental Standards for Freshwater Management (2020) prohibit any earthworks/soil disturbance activity within 100m of a natural wetland, and thus the purpose of this assessment and report was to delineate the extent of natural wetlands to establish boundaries for future works.

2. Site context

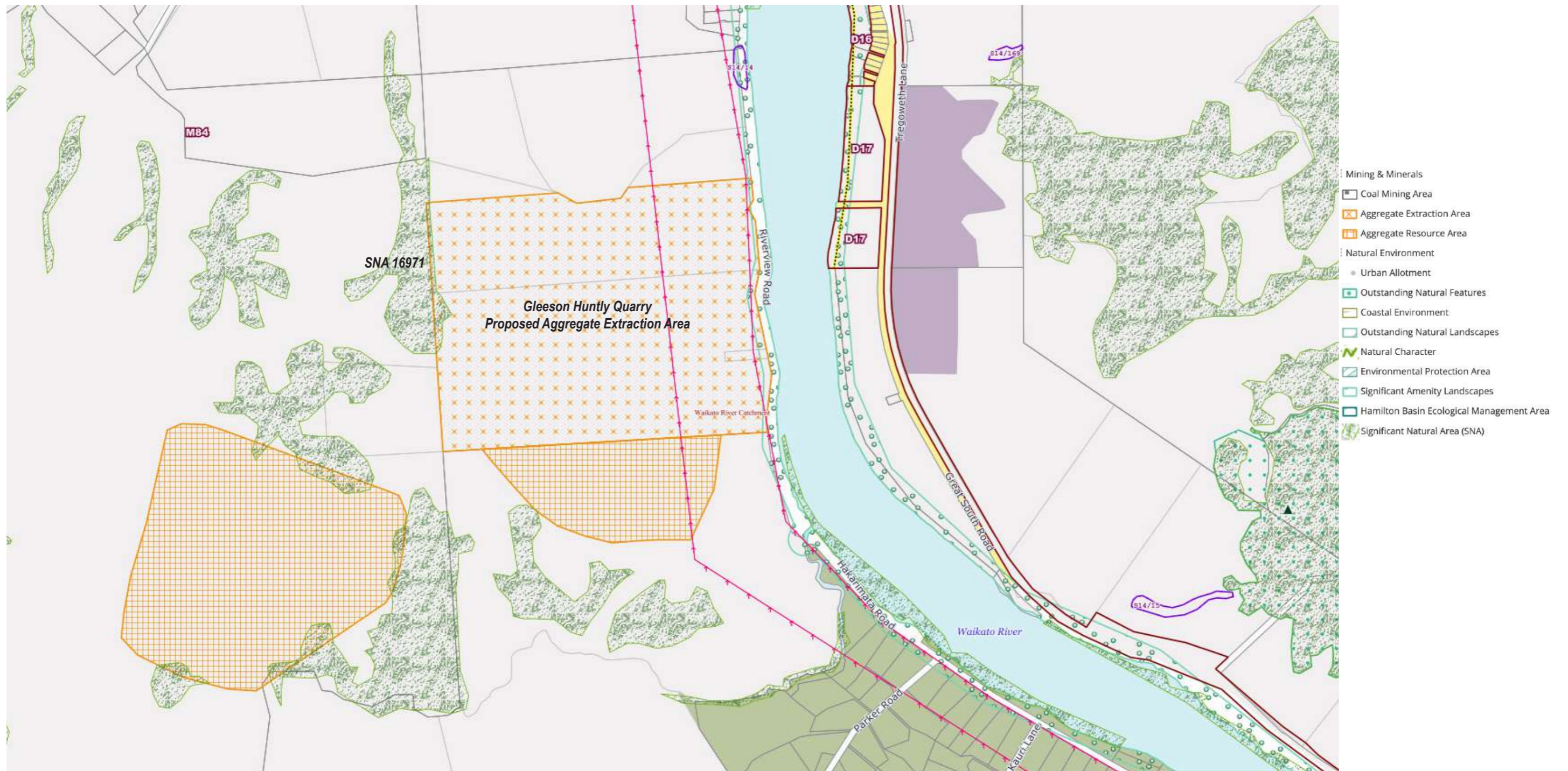
The SNA is a 11ha forested gully system that is within the Meremere Ecological District. The site lies within a landscape mosaic consisting of similar forested gullies within a pastoral matrix, which has a Threatened Environment Classification of 10-20% of remaining indigenous land cover (LENZ, 2012). The SNA is classed as being locally significant based on criteria in Table 11-1 of the Waikato Regional Policy Statement (2016), as it is a representative example of a common vegetation type (secondary podocarp-broadleaf forest) that enables key ecological processes and provides important linkage between adjacent SNA gully systems. Remnant forested gully systems with wetlands occupying the gully floor are characteristic of the surrounding landscape, with many wetland systems likely induced from agricultural modifications.

Several small degraded gully systems lie to the east of the SNA on Gleeson Huntly Quarry land which are proposed to be sites used for overburden/cleanfill disposal. Fill Area 2 has historically been used for plantation pine forestry, and has since been harvested and left in anticipation for the use of overburden disposal. Fill Area 2 is of interest to this report as it will be the closest fill to the SNA, and it contains a watercourse that drains into the SNA. A gully to the south of Fill Area 2 that is no longer considered as a fill area also contains a watercourse that flows into the SNA. The eastern edge of the SNA that lies within the proposed Aggregate Extraction Area contains *Ulex europaeus* (gorse) interspersed with young *Kunzea robusta* (kanuka) and occasional *Cortaderia selloana* (pampas) that has mostly been killed due to regular herbicide application.

3. Description of SNA

Vegetation in the SNA is predominantly indigenous secondary mixed podocarp-broadleaf forest. There are several main vegetation types, including *Kunzea robusta* (kanuka) woodland with sub-dominant *Leucopogon fasciculatus* (mingimingi), young *Cyathea dealbata* (silver fern), *Melicactus ramiflorus* (mahoe), *Myrsine australis* (red mapou) and *Piper excelsum* (kawakawa) forest, remnant *Phyllocladus trichomanoides* (tanekaha) stand with young *Coprosma arborea* (mamaki) understorey, and remnant gully forest containing old-growth tree species such as *Beilschmedia tawa* (tawa), *Knightia excelsa* (rewarewa), *Laurelia novaezelandiae* (pukatea), *Podocarpus laetus* (Hall's totara) and *Rhopalostylis sapida* (nikau). Native understorey shrubs and the vines *Freydenetia banksii* (kiekie) and *Ripogonum scandens* (supplejack) are common around watercourses. Regeneration of native species was observed in areas where stock damage was minor, mainly near watercourses. Browsing damage from livestock, goats and hares/ rabbits is evident around the forest margins.

As with nearby SNA gully systems it appears agricultural modification, including pugging by livestock and damming waterways, has created induced wetlands within the SNA. Induced wetlands are still classed as natural wetlands under the National Policy Statement for Freshwater Management (2020) and have full protection. An artificially constructed farm dam and access track in the southern part of the SNA has likely affected the hydrology of the watercourse and led to the formation of wetlands in the catchment.



Proposed Waikato District Plan showing location of proposed Aggregate Expansion Area and Significant Natural Areas.



Plate 1: Drone photographs of the SNA showing typical secondary podocarp-broadleaf forest and degraded gullies to the east.



Plate 2: Typical vegetation composition of the gully floor, including nikau, tawa, silver fern, mahoe, kawakawa and rewarewa.

4. Watercourse assessment

The extent of watercourse to be assessed was discussed with the Quarry Manager (Shawn McLean) for the purpose of delineating areas outside of the SNA that need to be avoided by quarry expansion works due to the current environmental regulations.

4.1. Methods

A sit visit was conducted on the 14th February 2022 to assess a section of the watercourse to the west of the proposed fill areas. The site visit involved assessing 534.5m length of watercourse within the SNA by noting hydrological characteristics and dominant vegetation species to determine which parts of the watercourse are streams or wetlands. The Resource Management Act (1991) defines a wetland as 'permanently or intermittently wet areas, shallow water, and land water margins that support a natural ecosystem of plants and animals that are adapted to wet conditions.'

For putative wetlands, the flow chart for steps for hydrophytic (wetland) vegetation determination (MfE, 2020) (Figure 1) was applied. Species have a 'wetland indicator status rating' based on their preference to wetland habitat (Table 1), and if all dominant species in the putative wetland are obligate or facultative wetland species then the area is deemed a wetland. On-site rapid vegetation determination tests were able to be done across the length of the watercourse. The watercourse was deemed to have 'normal circumstances' present, current weather conditions were warm and dry and the previous significant rainfall events being on the 12th February (6mm) and 7th February (55mm). There were no recent disturbances or modifications to the area that would affect the integrity of vegetation, hydrology or soils in the SNA.

Figure 1: Flow chart for hydrophytic vegetation determination, extracted from Wetland Delineation Protocols (MfE, 2020).

Figure 1: Flow chart of steps for hydrophytic (wetland) vegetation determination. Wetland indicator status abbreviations: FAC= facultative; FACW = facultative wetland; OBL = obligate wetland.

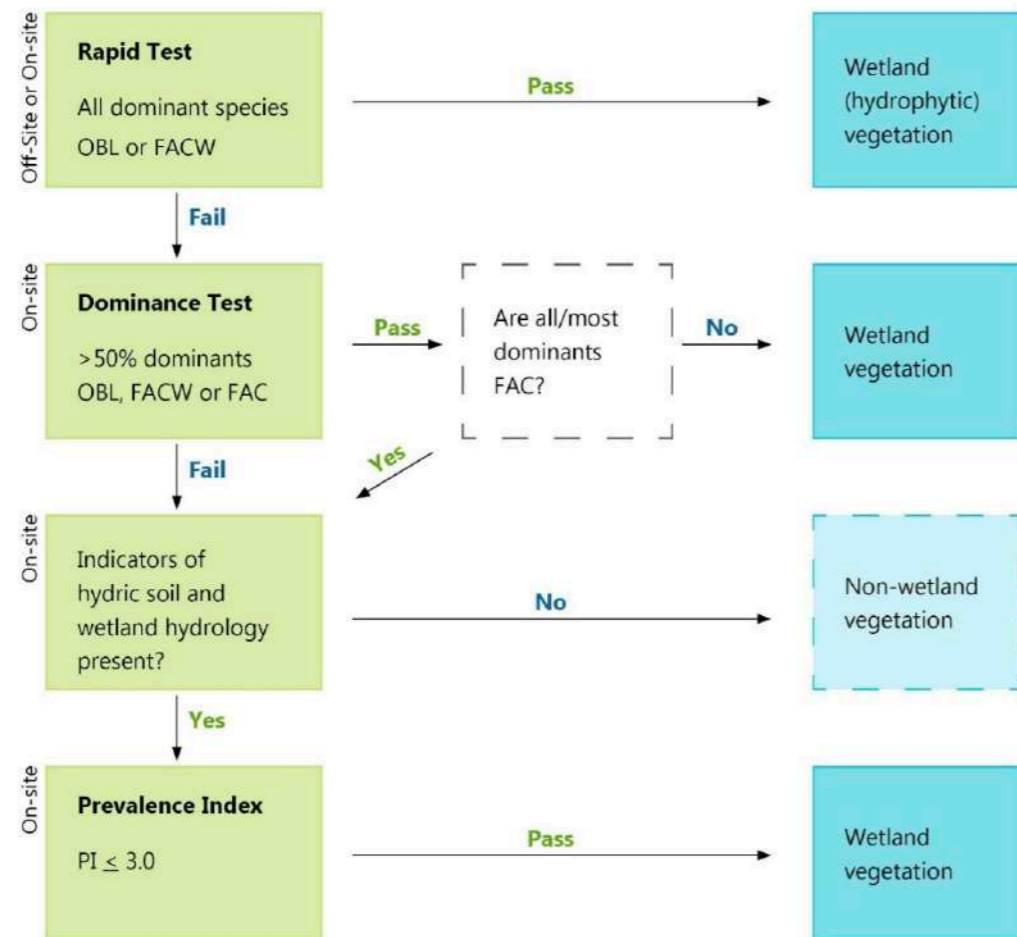


Table 1: Wetland indicator status rating system (Clarkson, 2013).

| Wetland Indicator Status Rating | Description | Probability occurrence in wetlands |
|---------------------------------|--|------------------------------------|
| OBL (Obligate) | Almost always is a hydrophyte, rarely in uplands | >99% |
| FACW (Facultative Wetland) | Usually is a hydrophyte but occasionally found in uplands | 67 - 99% |
| FAC (Facultative) | Commonly occurs as either a hydrophyte or non-hydrophyte | 34 - 66% |
| FACU (Facultative Upland) | Occasionally is a hydrophyte but usually occurs in uplands | 1- 33% |
| UPL (Obligate Upland) | Rarely is a hydrophyte, almost always in uplands | <1 % |

4.2. Results

4.2.1. Streams

Approximately 374 lineal metres of stream was assessed during the site visit. Stream channels were located in areas of steeper land gradient and thus had fast flowing water and clear defined banks. Streams lacked hydrophytic vegetation across the channel and were hard-bottomed, with substrate mostly consisting of small gravels, boulders and silt. Hydrologic heterogeneity was observed in stream channels, with areas of runs, riffles, pools and chutes present within the assessed reaches.



Plate 2: Permanent stream channel in the SNA.

4.2.2. Wetlands

Two wetlands are present within the defined area, the southern wetland being approximately 180m² and the larger northern wetland approximately 490m². Under the Wetland Types in New Zealand classification (Johnson & Gerbeaux, 2004) both wetlands are classed as swamps, which are characterised by being located in valley floors, plains and deltas, and have vegetation dominated by sedges, rushes and herbs with intermingled scrub and forest (Johnson & Gerbeaux, 2004).

The wetlands were distinguished by having wide flat channels with the herb strata dominated by dense stands of the facultative wetland species *Carex geminata* (rautahi). Occasional *Carex secta* (purei), *Carex virgata* (pukio) and *Cortaderia selloana* (pampas grass) were also observed in the herb strata, and occasional *Dacrycarpus dacrydioides* (kahikatea) and *Laurelia novaezelandiae* (pukatea) in the tree and sapling strata throughout the channel. The wetland edge was defined by the change from gully floor *Carex geminata*-dominated channel to sloping banks containing forest tree and shrub species such as *Cyathea* spp. (tree ferns), *Knightia excelsa* (rewarewa), *Melicytus ramiflorus* (mahoe), *Podocarpus laetus* (Hall's totara) and *Rhopalostylis sapida* (nikau). Leads of standing water and surface channels, particularly near the margins, were present throughout the wetlands. In these areas thick layers of leaf litter and silt had built up due to slow velocity of the water.



Figure 7: Southern wetland (top) and northern wetland (bottom) both dominated by the facultative wetland species *Carex geminata*.



Map of wetland and stream channels within the Significant Natural Area and proposed fill areas in Gleeson Huntly Quarry.

6. Discussion and recommendations

A total of 374.5 lineal metres of watercourse was assessed to delineate streams and wetlands. Two wetlands were present in areas of low gradient in the gully floor, in between steeper areas which contained a permanent hard-bottomed stream.

A setback of 100m from these wetlands must be delineated on the ground prior to the commencement of works for Fill Area 2. The proposed fill area is outside of the 100m boundary from the northern wetland, so it is not expected the fill works will encroach onto the boundary of the wetland. The degraded gully to the east of the northern wetland is not going to be used as a fill area, however it still lies within the Aggregate Extraction Area. Further assessment of the small remnant podocarp-broadleaf forest will be required if works are expected to affect the area.

7. References

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