Pattle Delamore Partners Limited

TECHNICAL MEMORANDUM

INVESTIGATION	Tahimana Groundwater Assessment Summary	**PROJECT**	Tahimana Subdivision
CLIENT	**Tahimana Limited**	**PROJECT NO**	C04732500
CLIENT CONTACT		**PREPARED BY**	Ryan Nicol
CLIENT WORK ORDER NO/ PURCHASE ORDER		**SIGNATURE**	
		DATE	1 May 2024

1.0 Introduction and Hydrogeological setting

This memorandum summarises my assessment of effects of the proposed Tahimana subdivision and development project. It includes a description of the hydrogeological setting at the Tahimana Subdivision site, potential effects on groundwater, and how the issues can be mitigated or avoided. It is based on information contained in a report prepared by Pattle Delamore Partners (2024[1]). It concludes that the development is unlikely to result in diversion or interception of groundwater, that a small increase in catchment throughflow may result, and that the development will not have adverse effects on groundwater, including hydraulically connected wetlands.

The Tahimana site is located around 4.5 km northwest of Mapua in Tasman region. It involves development of an area of land currently used for marginal agricultural purposes into a residential and lifestyle subdivision. The topography of the site is generally hilly, irregular terrain with incised gullies with the elevation across the site generally ranging between 44 – 108 metres above mean sea level (masl). The site can be split into two general surface water catchments which are East and West catchments.

The geology at the site consists predominantly of the Moutere Gravel Formation comprised of yellow-brown claybound gravels, containing deeply weathered clasts. Within the valley and gully floors, the Moutere Gravels have been reworked by fluvial processes to form a veneer which generally consist of saturated, low permeability sandy silts in which wetlands have formed. The Moutere Gravel Formation is underlain by Tertiary sediments and basement granitic rocks.

Wetlands are constricted to gullies and valleys and are relatively narrow (around 10 to 15 m wide) although at lower elevations/further downstream, they become wider (up 40 m). The wetlands located higher in the catchment are expected to be perched above the wider groundwater system whereas the lower elevation wetland sections are expected to be directly hydraulically connected to the wider groundwater system.

Groundwater levels have been measured at three monitoring locations at the site within two separate wetlands (two standpipes up to 2.1 m deep) and within the underlying Moutere gravels (one bore up to 20 m deep). Groundwater levels have been measured between 0.05 and 1 metres below ground level (m bgl) in the wetlands and between 2.2 and 2.6 m bgl in the deeper bore. Shallow groundwater flows roughly parallel to topography, following the surface water flow paths at the site which is in a general south to north direction. Shallow groundwater recharge in the vicinity of the site is expected to be predominantly from rainfall recharge.

There are no current or proposed groundwater takes at site and the closest neighbouring bore used for domestic use is more than 300 m away.

[1] Pattle Delamore Partners (PDP). 2024. Tahimana Subdivision: Hydrogeology Investigation. Prepared for Tahimana Limited. March 2024.

2.0 Potential Groundwater Effects

The project could have an indirect impact on groundwater recharge that may be contributing to hydrological functioning of wetlands. Therefore, the main potential effects on wetland recharge are:

- Interception of groundwater via excavations such as cuts and trenches, diverting groundwater recharge away from wetlands.
- Reduction of groundwater recharge that sustains wetlands at the site from the creation of impervious surfaces and stormwater management systems.

3.0 Management of Groundwater Effects

There will be no excavations within 10 m of any wetland at the site with the closest excavation proposed to a depth of 1 m bgl at a distance of approximately 13 m from the nearest downgradient wetland. The deepest excavations (up to 4 m) are proposed to occur in areas of the site close to (but below) ridgelines and spurs, which are generally where groundwater levels are expected to be deepest. While groundwater levels are likely to vary spatially as well as seasonally, excavations at the site as part of the development are unlikely to result in diversion or interception of groundwater.

To assess the potential changes in recharge to the wetlands from the establishment of impervious surfaces and stormwater management systems, water balance models were created to compare pre- and post-development states. The modelling indicated that the development would cause a redistribution in the source of recharge to the wetlands (i.e. general reduction in groundwater recharge and corresponding increase in surface water recharge contributions), although there would only be a very small overall increase in through flow (occurring as a small increase in surface flows) through each catchment.

Although the modelling did not indicate that the development would cause any issues on the overall hydrological functioning of the wetlands, Tahimana Limited have conservatively proposed additional management measures to divert some stormwater discharges from roof areas toward the heads of wetland areas in the gully systems, which will be beneficial for retaining recharge for these wetlands.

Overall, the groundwater assessment indicates that the development is unlikely to result in diversion or interception of groundwater, that a small increase in catchment throughflow may result, and that the development will not have adverse effects on groundwater, including hydraulically connected wetlands.

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