

BEFORE Independent Commissioner appointed
by Tasman District Council

IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of an application by CJ Industries Ltd
for to discharge contaminants to land
(backfill material) RM220578

**SUMMARY STATEMENT OF EVIDENCE
RYAN CHARLES SMITH NICOL ON BEHALF OF CJ INDUSTRIES LIMITED
(GROUNDWATER AND CLEANFILL)**

22 November 2022

1. SUMMARY

- 1.1 My full name is Ryan Charles Smith Nicol. I am a Hydrogeologist with Pattle Delamore Partners (PDP) and have been employed in that role since 2012. I have prepared this brief statement to summarise my assessment of the groundwater effects arising from the proposed Peach Island quarry.
- 1.2 A shallow, unconfined alluvial aquifer system underlies the Peach Island area which is predominantly recharged by flow losses from the Motueka River as well as rainfall recharge on the land surface. Groundwater from this aquifer is abstracted from a small number of privately owned and operated boreholes in the Peach Island area for irrigation and domestic supply purposes (there are 10 privately owned boreholes shown in TDC records within 1 km downgradient of the proposed quarry area).
- 1.3 Groundwater levels in the aquifer at the proposed Peach Island Quarry site have been measured by Envirolink Limited and PDP on behalf of the Applicant for the period between October 2019 and July 2022. The available data for the proposed quarry site indicates groundwater level fluctuations at the site are in the order of 2 to 3.5 m with the

highest groundwater level measured to be 0.5 m bgl (24545 Piezo 3) and the lowest water level measured to be 5.1 m bgl (24544 – Piezo 2).

1.4 If not appropriately managed, the proposed quarry activities that have the potential to impact groundwater quality at Peach Island are:

- (a) Exposure of groundwater within open pit excavations, increasing the susceptibility for contamination of the groundwater.
- (b) Groundwater inundation of fill material used to back fill the quarry excavations, causing any contaminants within the fill material to become mobilised within the aquifer and potentially affect neighbouring water supply bores.

1.5 To minimise the risk of adverse groundwater quality changes in the Peach Island aquifer the quarry will have tight controls on their operations at the site, including the composition of the material that is used to backfill the quarry excavations. An overarching groundwater and clean fill management plan (GMP) has been prepared which details management operational controls related to protecting groundwater quality. In addition to the site management controls, the GMP includes a groundwater level and quality monitoring regime to assess effects of the quarry activities on downgradient groundwater quality. The plan also refers to mitigation measures to respond to the results of the monitoring programme.

1.6 Following the filing of my evidence dated 15 July 2022, updates to the GMP (dated 2 September 2022) were made. These updates included:

- (a) Additional detail for managing uncertainty in groundwater level depths to avoid accidental inundation of excavations.
- (b) Clarification of “Stable Weather conditions”.
- (c) Minor adjustments to the proposed groundwater quality trigger levels.
- (d) Adjustments to determining if an adverse change in water quality has occurred.
- (e) Adjustment of proposed random chemical testing of clean fill material.

- 1.7 In response to a request for further information from Tasman District Council (Council) dated 11 August 2022, further clarification/updates to the following items were made (in addition to the updates to the GMP (paragraph 1.7 above) in my response dated 2 September 2022:
- (a) Updated range of groundwater level fluctuations, which is information to determine the potential depth of excavations.
 - (b) An assessment of the rate at which groundwater levels rise in response to large rainfall and river flow events, which defines the amount of backfill material that must be readily available to the site to avoid groundwater being exposed in the deeper quarry excavations.
- 1.8 The removal of the naturally occurring strata and backfilling with clean fill at the proposed Peach Island quarry site will result in some level of change to the physical structure of the aquifer and groundwater chemistry. Therefore, it meets the definition of a contaminant as defined in the TRMP (Chapter 2) and in the RMA, although this does not mean that the groundwater will be “contaminated” in the sense that this term is normally thought of.
- 1.9 The area in which the groundwater chemistry changes are expected to occur will be within the quarry footprint and the immediate downgradient (northerly) side of the quarry. To assess changes in groundwater chemistry from the proposed quarry activities, it is recommended that groundwater monitoring should occur over an area up to 1 km downgradient of the proposed quarry within groundwater bores that are accessible to the applicant. The extent of any changes in groundwater chemistry related to the quarry activities are expected to be observed within this monitoring area, and changes across the wider aquifer system are not expected to occur.
- 1.10 The immediate downgradient area where changes to groundwater chemistry may occur is similar to the area within a surface water way in which a discharge is allowed to cause a change in water chemistry. However, for this consent application, additional consent conditions are put in place to ensure that any change in water chemistry due to the quarry does not cause any downgradient water supply bore to fail the drinking-water standards and become unsuitable as a source of water supply. On that basis, the effects on groundwater quality are considered to be consistent with the NPS-FM (2020).

- 1.11 Groundwater sampling was undertaken at Peach Island in September 2022 and November 2022 to assess existing groundwater chemistry conditions. Groundwater sampling has also been undertaken at the applicant's existing Quarry site at 83 Douglas Road in October 2022. The applicant is undertaking a similar activity at their Douglas Road site to what is proposed at Peach Island currently occurs. The activity at the Douglas Road is undertaken with less controls than what is proposed for the Peach Island site and therefore provides a worst-case scenario in terms of potential groundwater chemistry changes from the proposed quarry activities at Peach Island.
- 1.12 The results of the Peach Island groundwater sampling available at the time of my statement indicated that the measured concentrations generally complied with the proposed trigger values, with the exception of iron and manganese concentrations in one private drinking-water supply bore 21033 which exceeded the proposed trigger values of 0.3 g/m³ (iron) and 0.04 g/m³ (manganese). Iron concentrations were measured in bore 21033 to be 1.29 and 4.1 g/m³ during the October 2022 and November 2022 sampling rounds respectively. Manganese concentrations were measured bore 21033 to be 0.061 and 0.051 g/m³ October 2022 and November 2022 sampling rounds respectively.
- 1.13 The results of the Douglas Road sampling indicated groundwater chemistry downgradient of the consented quarry site were below the proposed Peach Island groundwater chemistry trigger levels. Therefore, no adverse effects on downgradient groundwater users are indicated by that sampling.
- 1.14 Provided that the quarry is operated in accordance with the GMP, I consider that the effects on groundwater quality from the proposed activity are less than minor.

2. CORRECTIONS TO EVIDENCE

- 2.1 Supplementary Evidence (filed 4 November 2022)
- (a) Figure 2 – Incorrect spelling of 'Groundwater' in title of figure
 - (b) Table 1 – Mislabeled "Changes to Table 1"
 - (c) Table 2 – Mislabeled "Table 1"