

#### **Attachment 4 – DHI Te Puru Stream – Page 24 updated**

Immediately downstream of the Whitford-Maraetai Road bridge the predicted TN and TP concentrations combining catchment inputs and the Current WWTP discharge are 0.86 mg/L and 0.08 mg/L respectively.

These estimates are made up of the Current WWTP discharge contribution of 0.13mg/L and 0.01 mg/L for TN and TP respectively and the catchment derived concentrations of 0.73 and 0.05 mg/L for TN and TP respectively.

The combined estimates are very similar to actual monitoring data from Te Puru Park of 0.74 and 0.07 mg/L for TN and TP respectively.

Immediately downstream of the Whitford-Maraetai Road bridge the increase in mean annual TN concentration for the Short-Term discharge scenario is 0.07 mg/L while the increase in mean annual TP is 0.04 mg/L. For the Long-Term Stage 1 scenario these increases are estimated to be 0.07 mg/L for TN and 0.09 mg/L for TP. For the Long-Term Stage 2 scenario these increases are estimated to be 0.09 mg/L for TN and 0.12 mg/L for TP.

These values reflect the combination that the WWTP discharge makes to the average Te Puru Stream flow (Figure 4) and the percentage increase in TN and TP loads shown in Table 8.

Towards the mouth of the Te Puru Stream the incoming tide provides significant additional dilution to the dilution that occurs in-stream meaning that the average level of dilution at the Te Puru Stream mouth ranges from greater than 10,000-fold under the Current scenario greater than 1,300-fold under the Short-Term and greater than 300-fold under the Long-Term Stage 2 scenario (Table 2).

This results in very low nutrient concentrations relating to the WWTP discharges in the marine receiving environment.

For example, within the mouth of the Te Puru Stream under the Long-Term Stage 1 scenario the maximum increases in TN is 0.005 mg/L while for TP the maximum increase is estimated to be 0.002 mg/L.while under the Long-Term Stage 2 scenario (when the predicted dilution at this site is the lowest of all the scenarios considered) the maximum increases in TN and TP are 0.001 mg/L.

As such, increases in TN and TP within the marine receiving environment due to all three future WWTP discharge scenarios will be below detectable limits.

The effect of the WWTP discharge in terms of in-stream nutrients (i.e. upstream of the Quarry site) is discussed in detail in Stewart et al. (2024).