BEFORE THE INDEPENDENT HEARING COMMISSIONERS FOR GISBORNE DISTRICT COUNCIL

IN THE MATTER: of the Resource Management Act 1991

AND

IN THE MATTER: of an application by Gisborne District Council for resource consent associated with wastewater overflows

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SUMMARY STATEMENT OF EVIDENCE OF DR PETER STANLEY WILSON – WATER QUALITY

13 July 2021

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1 INTRODUCTION

1.1 My full name is Peter Stanley Wilson. I am employed by 4Sight Consulting Ltd (**4Sight**) as a Principal Coastal Scientist. I have the Qualifications and experience as outlined in my Evidence in Chief.

2 SUMMARY OF EVIDENCE

Existing Environment

2.1 My analysis of state of the environment (SOE) data showed that are, at times, elevated levels of contaminants (faecal bacteria, sediment, nutrients, and heavy metals) in the Taruheru River, Waimata River, Waikanae Stream, and Kopuawhakapata Stream that are unrelated to wastewater overflows. During routine sampling, the primary source of these contaminants was the upper catchment.

2.2 With regard to enterococci concentrations, all sites except Tuckers on the Taruheru River and Hirini on the Kopuawhakapata Stream were within (less than) the Urban FMU (annual median) guideline of 280 CFU/100mL. No sites, however, were within (less than) the Urban FMU 95th percentile guideline of 500 CFU/100 mL. Because these data excluded wet weather overflow events, the source of microbial contamination must be from non-wastewater overflow catchment sources, particularly those in the upper catchment.

2.3 The levels of enterococci in the Kopuawhakapata Stream suggest chronic microbial contamination.

2.4 Total nitrogen, total phosphorus, and total suspended solids all exceeded their relevant guideline levels at all sites, indicating elevated background levels of these contaminants in the rivers.

2.5 Ammonia (toxicity) was low at all sites and median concentrations were well below the toxicity guideline value.

2.6 Metal concentrations were below the analytical level of detection in most samples; however, they were, at times, up to an order of magnitude higher than their respective guideline values. These high levels are likely to be associated with heavy rain events, and most likely derived from urban stormwater.

Effects of Wet Weather Overflows

2.7 GDC records indicate that wet weather overflows occurred on average 2.5 times per year from 2006 to 2019, during heavy rainfall.

2.8 The greatest difficulty when assessing the effects of wet weather overflows on water quality is distinguishing the effects of the overflow from those resulting from catchment-derived contaminants that are washed into the waterway, which also contribute to degraded water quality. A 'rain only' event was sampled during 12–16 March 2018 where there was heavy rainfall, but no wastewater overflows, that I use as a point of reference. In this context, the effect of wet weather overflows on water quality is the further increase in contaminant levels over and above the levels measured during rainfall events without overflows.

2.9 The most notable effect of wet weather overflows on water quality is a large increase in faecal bacteria; faecal bacteria concentrations can be up to twice as high than during a rainfall event with no wastewater overflows. However, faecal bacteria concentrations exceeded the Recreational Water Quality Guidelines during heavy rainfall with and without wastewater overflows, indicating that the water was highly likely to be unsuitable for swimming at these times even in the absence of overflows.

2.10 Wastewater overflows also contribute to the levels of nutrients, including ammonia, total suspended sediments, and metals; however, the dominant source of these contaminants during heavy rainfall is typically catchment (non-wastewater) derived.

2.11 Contaminants in the river returned to pre-event concentrations within about 48 hours of the rainfall event. This period is no longer than would be expected following heavy rainfall with no overflows.

2.12 In general, wet weather overflows are unlikely to be the primary cause for the Gisborne urban rivers to not meet the Water quality objectives for the Gisborne Urban Freshwater Management Unit (FMU) in the Tairāwhiti Resource Management Plan (TRMP). The relevant objectives are for dissolved oxygen, nitrate (toxicity), ammonia (toxicity), and enterococci. The likely exception to this is for enterococci. The large but infrequent increase in enterococci concentrations during an overflow event has the potential to affect the 95th percentile water quality objective (but not the median objective).

2.13 GDC has committed to upgrading wastewater and stormwater systems and reducing the frequency and volumes of overflows as part of its DrainWise Wastewater Discharge Reduction Programme. Reductions in the frequency and volume of wastewater discharges are likely to result in overall improvements to the water quality in Gisborne urban rivers.

Effects of Dry Weather Overflows

2.14 Of the known dry weather overflows in the past five years, approximately 25% of them reached a waterway (i.e. less than two per year).

2.15 To assess the potential effects of a dry weather overflow, I took a highly conservative approach and estimated the potential concentrations of enterococci (human health) and ammonia (ecological health) in a large (Taruheru River) and small (Kopuawhakapata Stream) river assuming a dry weather overflow of 2,000 L was discharged over a period of two hours and the entire discharge reached the waterway (which is rarely the case). As such, the assessment provided a 'worst case' scenario.

2.16 A large overflow event would likely result in enterococci concentrations exceeding the Recreational Water Quality Guidelines (280 CFU/100 mL), indicating that the water would not be suitable for swimming near the discharge point. Flushing by the river and tides will likely return water quality to ambient conditions within 12–24 hours following the overflow event. I note that small overflow volumes (e.g., 100 L) would be unlikely to result in enterococci concentrations that exceed the Recreational Water Quality Guidelines.

2.17 Regarding ecosystem health, ammonia concentrations are only likely to exceed the NPSFM 2020 annual maximum bottom line if a large overflow was to happen into a small waterbody, such as the Kopuawhakapata Stream. This suggests that, based on the data available, dry weather overflows are unlikely to cause adverse effects to aquatic fauna with regard to ammonia toxicity unless a large volume with high ammonia concentrations is discharged into a small stream.

2.18 Overall, dry weather overflows have the potential to cause a waterway to not meet the 1-day minimum dissolved oxygen water quality objective in the TRMP, but they would be highly unlikely to cause the waterway to not meet the 7-day mean objective. In a similar manner to wet weather overflows, dry weather overflows have the potential to affect the 95th percentile enterococci objective but are unlikely to affect the median objective.

Dr Peter Stanley Wilson

13 July 2021