

BEFORE THE HEARING PANEL

IN THE MATTER the Resource
Management Act 1991 (the Act)

AND

IN THE MATTER of **APP-2005011178.01**
and **APP-2018201909.00** for resource
consents associated with the operation of
the Eketāhuna Wastewater Treatment
Plant, including construction of a wetland,
diversion of water, construction of a bund, a
discharge into the Makakahi River, a
discharge to air (principally odour), a
discharge to land via pond and wetland
seepage, Bridge Street, Eketāhuna

REPORT TO THE COMMISSIONERS

**DR BRENT COWIE (CHAIR), MR REGINALD PROFFIT AND MR PETER
CALLANDER**

**SECTION 42A SUPPLEMENTARY REPORT 2 OF TIMOTHY MICHAEL BAKER
GROUNDWATER**

5 November 2018

A. INTRODUCTION

1. My full name is Timothy Michael Baker.
2. I prepared a S42a report on groundwater matters dated 7 March 2017 and a Supplementary Report dated 4 April 2017. My qualifications and experience are unchanged from these reports, and for brevity, are not repeated here.

B. SUPPLEMENTARY COMMENT

3. I have prepared this further evidence in response to the new application (**APP-2018201909.00**) lodged by Tararua District Council to include a treatment wetland at the end of the wastewater treatment process for Eketāhuna. This supplementary evidence addresses the potential effects on groundwater of the proposed wetland.
4. The proposed treatment wetland will cover an area of approximately 5,000 m² and is to be located on the lowest river terrace, immediately adjacent to the Makakahi River. This treatment wetland will be used for polishing; further treating the wastewater after it has passed through the oxidation ponds and the UV disinfection system prior to discharge to the river.
5. The lower terrace comprises 2 to 3 m of alluvial material overlying low permeability mudstone¹. The treatment wetland will be constructed on this terrace and surrounded by bunds between 1.3 m and 2.5 m high, designed to protect the wetland from flood events.
6. Whilst groundwater is present in the alluvium beneath the terrace, Opus (2018) do not consider this to be an aquifer (because it is unlikely to hold a useable amount of groundwater). Nevertheless, should the wetland allow vertical migration of treated wastewater (i.e. leakage) there is the potential for the groundwater contained in the lower terrace to become contaminated, and it is likely that this will enter the river.

¹ Eketāhuna WWTP Preliminary Groundwater Investigation. Opus, 2018. Memo dated 28 June 2018.

7. Following a s92 request for further information on the wetland design, the applicant advised that that an acceptable loss from the base of the wetland would be in the order of 10% of inflow, or approximately 651 m³/day.
8. To ensure no more than 10% leakage, the applicant recommend a liner (likely to be clay) with a hydraulic conductivity of no greater than 1.4 x 10⁻⁷ m/s. I agree with this and recommend that the desired permeability of the liner material is incorporated into a consent condition.
9. Wetland performance is proposed to be assessed during January, April and October by measuring the nitrate concentration of the inflow and out flow of the wetland. The applicant² states that taking a winter (July) sample is not useful because winter nitrate concentrations are likely to be diluted by storm water infiltration and inflows. Consideration could be given to a July sample being collected, keeping the monitoring programmes consistent across the wastewater and the wetland.
10. The applicant states that the wetland monitoring frequency could be reduced to once or twice a year, after 3 to 4 years, when the wetland plants have fully established. Given the sensitivity of the receiving environment, my view is that monitoring of the discharge should continue at the minimum frequency of January, April and October or at a quarterly frequency for the duration of the consent, consistent with the monitoring of the discharge of the main treatment system.

² S92 Response Letter from WSP | Opus dated 21 September 2018.

C. RECOMMENDED CONDITIONS

11. I recommend a condition stating that the permeability of the wetland liner shall be no greater than 1.4×10^{-7} m/s is included. The in-situ permeability of the material should be confirmed and documented by an appropriately qualified engineer or scientist.

Tim Baker

5 November 2018