

Report 99.393

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Report to the Environment Committee
from Brydon Hughes, Resource Scientist

Peka Peka Groundwater Investigation

1. Purpose

To inform the Committee of the results of a groundwater quality investigation undertaken in the Peka Peka area of the Kapiti Coast.

2. Background

Considerable rural residential development has taken place on the Kapiti Coast over recent years. As most of these developments are not provided with reticulated services, a majority of households use septic tanks for the treatment and on-site disposal of domestic sewage. Many households also rely on shallow groundwater for domestic water supply. The dual use of shallow groundwater for drinking water supply, and as a receiving environment for wastewater discharge, is incompatible and has the potential to result in adverse environmental and health effects, particularly where septic systems are closely spaced.

While septic tank installations are required to meet specific design and installations conditions outlined in the Proposed Regional Discharges to Land Plan, little information has been collected to date to quantify the actual physical effects of septic tank effluent discharge on groundwater quality.

In addition, knowledge of bore locations and the volume of groundwater abstracted for domestic supply from the unconfined aquifer is relatively poor across much of the Kapiti area. This is primarily due to the construction of shallow bores being a permitted activity.

3. Survey Outline

Initial fieldwork for this investigation involved staff visits to most residential properties along Peka Peka and Te Hapua Roads. During these site visits, information was collected on bore locations and construction details, as well as on

groundwater usage. Wherever possible a groundwater sample was collected and sent to the WRC laboratory for analysis to determine nitrate-nitrogen levels and the presence of indicator bacteria.

Groundwater samples were collected from a total of sixty bores during the course of the investigation. Bores showing anomalous results from the initial sampling round were resampled in mid-March to establish temporal variations in groundwater quality. All property owners were notified of sampling results.

4. **Survey Results**

The survey results are described in detail in the report *Peka Peka Groundwater Investigation*. Copies of this report will be available for Councillors at the meeting.

A total of 81 bores were located within the study area. Of these, approximately 50 percent were either used for permanent domestic supply or to supplement drinking water from rainwater supply. Other major uses of groundwater in the area were garden irrigation and stock watering. In general, residents along Te Hapua Road reported excellent aesthetic water quality, while in the Peka Peka area aesthetic groundwater quality varied considerably. Groundwater in this area can be discoloured and have poor smell or taste because of the presence of peat deposits in the unconfined aquifer.

Sampling results indicated limited bacterial contamination of groundwater in the study area. Three bores in the Peka Peka area contained indicator bacteria during both sampling rounds. This contamination was in two cases attributed to the close proximity of the bore to the septic tank discharge point, while poor bore construction was the likely cause of microbial contamination in the third bore. This finding is similar to previous investigations undertaken in the Te Horo Beach area where indicator bacteria were only found in bores located close to septic tank discharge points.

A number of bores in the Peka Peka township, including both bores containing bacterial contamination, exhibited high nitrate-nitrogen concentrations consistent with localised contamination by septic tank effluent. The maximum nitrate-nitrogen concentration recorded, 21 mg/L, was significantly higher than the recommended safe level for drinking water of 11 mg/L. In the northern portion of the study area, along Te Hapua Road, elevated nitrate levels of up to 18 mg/L were observed across a relatively large area. As most of the bores exhibiting elevated nitrate levels in this area are not located close to any recognised source of nitrate contamination and land use is relatively low intensity in this area, it appears the nitrate contamination may result from an intensive horticultural area on the Hautere Plain.

5. **Summary**

Results of this small scale groundwater investigation indicate significant usage of shallow groundwater for domestic supply in rural areas of the Kapiti Coast where lifestyle block development has occurred. Future management of this resource

(especially groundwater quality) should take account of the high level of current use and the potential for this to increase as development proceeds.

Microbial contamination was detected in three of the sixty bores sampled during this investigation. The origin of the contamination at two sites was attributed to insufficient separation distances between septic tanks and bores while the contamination detected in the remaining bore appeared to result from poor bore construction. High nitrate-nitrogen concentrations were noted in a number of bores in the Peka Peka area indicating that septic tank effluent is having a significant localised effect on groundwater quality. The widespread area of elevated nitrate-nitrogen levels observed in the Te Hapua Road area was attributed to the downgradient effect of intensive horticultural land use on the nearby Hautere Plain.

The following steps are recommended to minimise the impact of on-site wastewater disposal on the Kapiti Coast:

- Add shallow bores in the Peka Peka area to the baseline groundwater monitoring program;
- Develop educational/best practice material to better inform landowners about drilling bores (appropriate siting, construction and maintenance) and on-site effluent disposal (care and maintenance of septic tanks);
- Improve compliance monitoring of septic tank performance;
- In conjunction with KCDC, formulate effective policy for future residential development on the coastal plain. Considerations include septic tank design/performance, minimum lot size, provision of reticulated services, and the use of community wastewater or water supply facilities in future developments.

These recommendations should be considered in the formulation of the 1999/00 work programme and in the Council's long-term financial strategy.

6. **Communications**

All property owners were notified of sample results.

Copies of the report have been distributed to KCDC and a press statement released.

The primary way the findings of this report will be communicated is through the preparation of educational material for property owners and drillers covering septic tank care and maintenance as well as recommendations for appropriate bore siting and construction.

7. Recommendation

That the report be received and its contents noted.

Report prepared by:

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