

Tauranga - Sustainability in a Young and Growing City



Servicing of a town of 30,000 people using environmentally sustainable principles

by Lee Jordan

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Introduction

Tauranga City is a young city that is already applying sound ecological principles to its treatment of stormwater but until recently has done very little towards promotion of water conservation and reuse. In fact, the city residents voted against any measures of conservation in a recent poll and asked the city to supply as much water as was required to meet the demand. Fortunately the council chose not to comply with this poll result and decided that it should introduce water meters instead.

With the growth issues facing the city it is now time to consider a much stronger ecological approach to the provision of water and wastewater services.

Figure 1:
Aerial view of Tauranga City



Background

New Zealand is a country consisting of principally of two islands (North Island and South Island) about the same size as Great Britain with a population of 3.7million people, 9 million cattle and 47million sheep. It is therefore not surprising that 54% of New Zealand's greenhouse gas emissions come from animal flatulence and waste. We are a country very proud of our "clean green" image and have legislation (Resource Management Act) designed to promote the sustainable management of natural and physical resources. This act also provides for the protection of the interests of the indigenous people of New Zealand, the Maori.

Tauranga is a coastal city in the northern part of the North Island with a warm, temperate climate and a population of 91,000. Soils in the area are free draining volcanic ashes with sand along the coastline. In 1964 our population was 24,000 and since that time we have been the fastest growing area in the country. The city is one of New Zealand's major resort areas and the hinterland around the city is the centre of New Zealand's kiwifruit and avocado growing. Our port is the largest export port for the country.

Our projections are that Tauranga will continue to grow at a rate starting at 2.8% and tapering off to 2.1% per annum for the next 20 years.

Until the mid 1960's dwelling lot sizes were generally around the 1'000 m² thus giving a density of (allowing for roads and reserves) 7 – 8 lots per hectare. At this density, septic tanks were able to comfortably handle household wastewater and all stormwater was discharged to the ground via soakholes. At this time it was realised that this extravagant use of land could not continue and the city was reticulated with a wastewater system, thus allowing for higher density development. This collected wastewater is then treated to bathing quality and discharged to the ocean. Some is used to irrigate an adjacent golf course and park.

Over the last 10 years half of all the new dwellings constructed have been infill development within the existing residential area. However, there is still a demand for greenfield development and to accommodate some of this we are currently preparing a plan for an area, to be called

Wairakei, of 1'260 ha. which may house around 35'000 people.

We are fortunate to begin our infrastructure planning with a clean sheet of paper and can take advantage of the latest thinking in the provision of environmentally sustainable infrastructure.

MAJOR INFRASTRUCTURAL ISSUES

There are two critical infrastructural issues which must be resolved before any rezoning of the land from the current "Rural" zone to zones that will allow residential and business development.

1. Water:

The current water supply for the city is sufficient to provide an adequate supply to the existing residential / industrial zones, but is insufficient to meet the needs for any expansion into greenfield areas. With many of the kiwifruit and avocado orchards already having rights to draw water from the streams in the hinterland for irrigation purposes, there is not a lot of water, if any, remaining in many streams for abstraction for municipal supply purposes, as the minimum instream low flow requirement is set at Q5 – 7 day low flow (the lowest seven-day flow expected to recur, on average, every five years).

2. Stormwater:

Running through the centre of the future Wairakei is an old river bed which now has no outlet. To date this has been used as a "bathtub" which fills up during a storm and then drains through a mixture of evaporation, transpiration, and soakage. With the proposed further development of the area, computer modelling has shown that an outlet to this "bathtub" will need to be constructed to assist with the draining. The most suitable outlet is to a river 1.6km away and this can be achieved from an engineering perspective, with an open channel, but culturally it is not currently acceptable. This is because the river is an important food source to the Maori people and they do not want to see the water quality downgraded. Also, just downstream from the proposed outlet, is an estuary that is already silting up and the Maori people do not want to see any further silting up of this area.

What are we doing?

Tauranga City is already applying sound ecological engineering principles to its treatment of stormwater in more recently developed areas, by constructing detention ponds for silt removal and to minimise storm flows, along with larger ponds for the removal of nitrates and phosphates. These larger ponds are built on the harbour edge and are also designed to provide for fish habitat. These same principles will be used for the stormwater treatment at Wairakei.

However, until recently, the city has done very little to promote water conservation and reuse. Water meters are currently being installed and a pricing strategy for the water will ensure that a basic supply is available to all households at a very reasonable price. As usage increases, so will the price. This is expected to provide an average reduction of water use of between 15% and 20%. With the issues now confronting us it is time to consider a much stronger ecologically acceptable approach to the provision of water and wastewater services. To help evaluate what options are available to us we have recently engaged MWH New Zealand Ltd. (Montgomery Watson Haza) in conjunction with CSIRO (Commonwealth Scientific and Industrial Research Organisation – Australia) to prepare a report evaluating various options. Their brief in short is to:

"Identify potential environmentally friendly and publicly acceptable practices that could be used for the provision of a water supply and disposal of wastewater, and stormwater, to urban development in a sustainable manner, and assess their viability both on a cost and risk basis."

In carrying out this assessment, the consultants have been asked to look at each option and address the following issues:

- List the good and bad points of its implementation including levels of service.
- Assess the cultural implications.
- Provide a cost estimate of implementing the option.
- Provide a cost estimate of operating the option.
- Assess the risk factors of the option.
- Assess the energy demand of the option.

This report is due to be received in April, after which a team of market researchers will take the report to the community and assess the level of community acceptance of each option.

Outcome

The outcome we hope to achieve from this research is not to find the cheapest option for the provision of services to a large greenfield site, but to gather sufficient information on each option to be able to make a balanced decision taking the community and the environment into account.

Cost is not necessarily a determining factor as this will be paid for by the development within the greenfield area by way of Impact Fees (i.e., a charge for each new lot created to cover the cost of the infrastructure) and will therefore be financially neutral to the City. At the same time however,

from a developers point of view, costs cannot be so high that development will not be viable.

Obviously, future development has to be more environmentally sustainable and this is expected to result in extra costs. It is generally accepted that water supply, wastewater disposal, and stormwater treatment will all be more expensive than they have been in the past.

It is this Council's job to find that fine line between managing the needs of the present without compromising the ability of future generations to meet their own needs while maintaining the ecological and environmental integrity.

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