

# LOADSHIFT

IAN PARKES REPORTS ON THE CAREFUL PLANNING THAT HAS GONE INTO AN UPGRADE OF WATERCARE'S MAIN WATER TREATMENT PLANTS. AT THE SAME TIME AS IT UPGRADES THE PLANTS SO THEY WILL SERVE AUCKLAND FOR THE NEXT 10 TO 15 YEARS, WATERCARE WILL ENSURE THAT THE REGION CONTINUES TO RECEIVE THE WATER IT NEEDS. PHOTOGRAPH BY RACHEL ALFORD.



THE ARDMORE AND HUIA WATER TREATMENT PLANTS ARE THE GRAND OLD LADIES OF AUCKLAND'S WATER PLANTS. HUIA FIRST WENT INTO OPERATION IN THE 1920s; ARDMORE WAS OPENED IN 1956. THESE OLD UP-WASH VALVES, INSIDE THE HUIA PLANT, WILL STAY WHEN THE PLANT UNDERGOES AN UPGRADE NEXT YEAR.

How do you carry out major construction work on four big water treatment plants to meet stringent new drinking water standards and still keep supplying your customers? That's the challenge that Watercare's engineers faced when they planned major upgrades at Watercare's main treatment plants during the next 12 months. However, some careful planning means that the upgrades will proceed and that the Auckland region is assured of sufficient water.

Watercare's two biggest water treatment plants are the Huia Water Treatment Plant, in the Waitakere Ranges west of Auckland, which supplies up to 25 per cent of the region's peak demand, and the Ardmore Water Treatment Plant, in Auckland's far south, which supplies up to 65 per cent of the region's water. Reducing capacity at those plants puts pressure on the rest of Watercare's treatment capacity.

Happily, the Ardmore plant – which is the workhorse of the regional system – can run at reduced capacity while engineers carry out the upgrade, beginning this month. The Ardmore plant, which has a maximum daily capacity of 318,000 cubic metres, can be upgraded in sections while maintaining a minimum daily capacity of 200,000 cubic metres. It's more difficult at the Huia plant. At Huia, Watercare also needs to replace a channel that collects and carries water from the filter beds to the treated water tanks. That will require a shutdown of the plant for four weeks early next year.

To make up the shortfall in water in the west while Huia is out of operation, Watercare is building a \$2 million pumping station at New Lynn. It will pump water to Auckland's west, from Ardmore, during the brief shutdown of the Huia plant. The pumping station will be needed in the future in order to keep Auckland's fast-growing western and northern suburbs supplied with water.

So, through some well-thought through shifts in load, Watercare can ensure that the Auckland region is supplied with water while the company undertakes the work at the water treatment plants.

The Waitakere Water Treatment Plant and the Onehunga Water Treatment Plant – both of which are a fraction of the size of the Ardmore and Huia plants – will also be upgraded in the project. The upgrade at Onehunga is a smaller job because of the characteristics of the water there.

The work at the treatment plants has been

prompted by the parts of the New Zealand Drinking Water Standards 2000 that come into effect on 1 January 2005. The majority of the drinking water standards took effect in 2000, but some parts were delayed until 2005 because they require upgrades at many water treatment plants in New Zealand. Watercare's new Waikato Water Treatment Plant was designed to meet the standards and complies already.

The most significant change in the drinking water standards from January 2005 is a requirement to reduce turbidity – that's the quantity of suspended solids in the water – from 0.5 NTU (nephelometric turbidity units) to 0.1 NTU. As pathogens tend to attach themselves to these tiny particles, taking them out of the supply reduces any remaining pathogens' options for a free ride into the water network.

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Ministry of Health's drinking water standards are based on World Health Organisation standards and are very robust.

To meet the new standards at Ardmore and Huia, Watercare is replacing the filter sand, upgrading the filter backwashing capability, the filter-to-waste systems, and the process controls.

The project also includes improved washwater recovery systems. New washwater thickeners will remove solids before the washwater is recycled to the plant inlet to reduce the risk of recycling pathogens. Watercare is also upgrading the electrical systems at Huia and Ardmore.

The Waitakere Water Treatment Plant will receive a similar upgrade, and it will be fitted with a new pre-treatment facility.

Overall, the upgrades will bring improvements in Auckland's water treatment plants that will mean the plants are fit to serve the region for at least the next 10-15 years.

Once Watercare had mapped out its schedule to meet the January 2005 deadline, the company's analysis showed Watercare would have sufficient capacity to meet demand for water in normal circumstances. But in the worst-case scenario, based on data from the last 10 years (plus adjustments for population growth), Watercare could have a demand shortfall in a sustained period of hot, dry weather.

For that reason, Watercare has decided to bring forward an extension of the Waikato Water Treatment Plant. The extension will boost maximum daily capacity from the Waikato plant from 50,000 cubic metres to 75,000 cubic metres a day.

Bringing forward the Waikato extension, which will be complete by January 2004, has reduced the risk of a shortfall from small but significant, to almost non-existent. The general manager of water, Phil Gormack, says that in the very unlikely event of abnormally high demand peaks, Watercare would ensure supply by managing water at an operational level. That would include maximising use of the storage capacity in the system's reservoirs and other measures.

Phil says the need to upgrade to maintain Watercare's 'A' grade rating across all of its treatment plants brought into question the viability of two other water treatment plants – one at Papakura and one at Huia Village in Auckland's far west.

The Papakura plant takes water from Watercare's smallest dam, Hays Creek, and supplies up to 10,000 cubic metres of water daily to Papakura township. Phil says Watercare is consulting with Papakura's United Water about the Papakura plant.

The Huia Village Water Treatment Plant is even smaller, supplying 450 properties. Phil says one option would be to link residents in Huia Village to the local network through a new pipeline, supplying water from the main Huia plant in the Waitakere Ranges. However, some residents have told Watercare they want to keep the Huia Village plant to retain an unfluoridated supply. A decision has been deferred while Waitakere City Council polls residents on fluoridation.