greater WELLINGTON
REGIONAL COUNCIL

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Bulk Water Supply Development Strategy 2008

1. Purpose

To outline the results of recent investigations into future bulk water sources and recommend several water source developments.

2. Significance of the decision

The matters in this report do not trigger the significance policy of the Council or otherwise trigger section 76(3)(b) of the Local Government Act 2002 at this stage.

3. Introduction

Historically, significant water supply infrastructure to serve the Wellington urban area has been built at infrequent intervals of 25/30 years, but each project has been costly. The largest recent projects were the Stuart Macaskill lakes and the Wainuiomata water treatment plant. These lakes and the associated water treatment plant catered for a significant growth in the population.

When the current 1 in 50 year security standard was adopted in June 2000, in consultation with our customers, water supply at that time was sufficient for a 1 in 200 year return period. However this has now reduced below the 1 in 50 year standard. Modelling shows that it will continue to drop at an increasing rate unless measures are taken to increase the water supply.

4. Background

Report 05.359 titled Water Source Development Strategy, which was considered by the Utility Services Committee in September 2005, outlined a number of potential projects to supply additional water. It concluded investigations should continue into a few specific projects. Since then, the option of raising the maximum water level of the Stuart Macaskill Lakes has been included and a Te Marua pumping station omitted. The latter was omitted because it has now been determined that the benefits in terms of water sourced are very similar to abstracting more water at the Kaitoke weir.

Also, since 2005, Statistics New Zealand has raised their population estimate for the Wellington metropolitan area to 379,000 and substantially increased their future population projection. Further refinement of Greater Wellington's sustainable yield model means that where previously we believed there was sufficient water for a population of 377,000, this has been revised downwards to 368,000. These changes have increased the probability of a peak demand shortfall in water supply and accelerated the need to have access to additional source water.

5. Planning framework

The Council is required to meet the provisions of the Local Government Act 2002 which require various options to be evaluated. The specific provisions of the Wellington Regional Water Board Act 1972 (the Act) are also relevant for the bulk water supply function. The Greater Wellington Regional Council (GWRC) now assumes the role of the Board.

Section 26(1) of the Act states:

> *It shall be the function of the Board to investigate, construct, extend, enlarge, maintain, and repair waterworks for the bulk supply of pure water to constituent authorities.*

That is, the GWRC has a statutory duty to provide adequate water to the constituent authorities. At present, the constituent authorities are the four city councils in metropolitan Wellington.

Various parcels of land were transferred to the Board to use for water catchments (or for future use as water catchments) and for forestry purposes so the Board could carry out its water supply function. While some of the areas of land set aside for future water catchment are currently being used for recreational purposes, their prime purpose of water supply remains. This prime purpose is recognised in Greater Wellington Water's (GWW) management plan covering future water catchment areas.

6. Investigation into new water sources

Attachment 1 is a comprehensive report outlining options for sourcing additional water. The report briefly mentions demand-side initiatives but these will be included in a wider Regional Water Strategy. The options identified are described below.

6.1 Options – short-term

- Reducing the minimum flow at the Kaitoke weir from 600 litres/second (L/s) to 400 L/s
- Building a treated water reservoir in central Wellington in conjunction with the Wellington City Council and possibly the Capital and Coast District Health Board
- Raising the maximum water storage level in the Stuart Macaskill Lakes
- Developing the Upper Hutt aquifer.

6.1.1 Discussion

There are risks with all four options. While the scientific studies for the reduced flow at Kaitoke weir show there may be some adverse effects downstream, ways of managing them are being discussed with stakeholders. Hence, the outcome is dependent on the ability to obtain a variation to the existing consent to reduce the minimum flow.

Discussions about sharing the cost of a new Wellington city reservoir have been ongoing for several years but the Capital and Coast District Health Board has been unable to make a commitment. If a commitment is not made soon, it is proposed to ask Wellington City Council to consider a two way agreement with GWRC. There is no guarantee resource consents can be obtained for the reservoir site in the city town belt on an area above the Prince of Wales Park.

Preliminary analysis for raising the water level in the Stuart Macaskill Lakes indicates it is practical. Detailed analysis though may increase the cost estimate; this should be known in a few weeks. A building consent is required for the project. Some minor variations may be required to the existing resource consents but no new consents are required.

If the first three short-term projects mentioned above are implemented, then modelling shows sufficient water will be available for the population of 395,000 projected to be reached by 2012. Put another way, completion of these three projects only restores the system to the adopted 1 in 50 year security standard (2% probability of shortfall in any one year). They do not provide for future growth. Hence, development of a fourth project, the Upper Hutt aquifer, needs to proceed in parallel with the other three to provide for growth.

For the Upper Hutt aquifer, the abstraction required is subject to resource consents and further testing.

With the first three projects and consent for 16 million litres a day (MLD) abstraction from the Upper Hutt aquifer, modelling shows there would be sufficient water sources for a population of 425,000 (projected to occur by 2022), or 440,000 if the aquifer provides up to 24 MLD.

6.2 Demand management

There are many demand-side options available that should reduce dependence on the bulk water supply system. These will be included in the Regional Water Strategy. Introduced over a period, it is expected these initiatives could deliver significant savings in water demand. For example, government regulations for water efficiency labelling of appliances are expected to be agreed in July 2008 and implemented by July 2009.

The water supply/infrastructure managers of the four city customers have been involved in development of part of this strategy. They took part in the multi-criteria selection process that considered the various dam sites. Water metering is a demand management tool available to the TLAs rather than Greater Wellington. The water supply/infrastructure managers have indicated that in order to advise their councils on the options, they would also need to provide

some high level information on the costs related to water metering as a longer term option. Greater Wellington has some up to date information and it is proposed to share this with the four city councils.

6.3 Options – long-term

Continued population growth will eventually outstrip the reduction in water consumption that demand management can provide and lead to a situation where more source water is required.

If all the short-term options are able to be implemented and demand management programmes deliver a 15 percent reduction in water usage, then an additional water source will be required when the population reaches 460,000. Based on the latest population projections, this will occur about 2040. Conversely, a return to the level of the 2005 population projections would defer the date even further.

As a cautionary note, failure to achieve any of the short-term options brings the requirement for a new major water source much closer.

If none of the four short-term options are implemented, then development work for a new dam needs to progress almost immediately (although some delay may be possible if significant demand management initiatives are implemented now). This is because there is already a water source deficit and development of a dam will take 8 to 10 years to complete.

All that can really be said at this point in time is there is considerable uncertainty as to when a major new water source in the form of a dam will be required. For this reason, there is no immediate need to continue investigations. The situation can be reviewed as each short-term option is achieved or halted. Rather, naming the preferred dam site provides the community with information and removes other sites from consideration.

Attachment 1 includes consideration of three dam sites. Three multi-criteria analysis workshops were carried out. These were with water supply/infrastructure managers from the four city councils, Greater Wellington Regional Councillors, and GWRC Divisional Managers. All workshops were lead by independent facilitators from MWH Consultancy. First choice by a clear margin for all three groups was the Whakatikei dam site and associated infrastructure. Key advantages identified were:

- It has a security of supply advantage through being located on the western side of the Wellington fault line, whereas all the existing water treatment plants are located close to, or to the east of, the fault line.

- It is closer to the areas of projected population growth in the western side of the region.

- The Whakatikei dam can be increased in height for $1M to create a storage reservoir that is 50 percent larger. There is also the potential to recharge the reservoir from the Akatarawa River via a tunnel as a future development.

Although the Whakatikei dam site and the water catchment are owned by Greater Wellington, the land designation is not quite appropriate for the development envisaged. Processes can be advanced now to ensure the District Plan includes the required designation. This provides greater certainty for the project when it is needed and releases the other two dam sites from consideration for the foreseeable future.

6.4 Timing – Upper Hutt aquifer vs a dam

An option is to proceed with a dam immediately instead of developing the Upper Hutt aquifer. A table in Attachment 1 indicates the nett present value (NPV) cost of building a dam is $94M. Developing the Upper Hutt aquifer followed by a dam has an NPV of $70M since large value expenditure is farther into the future. This is a conservative analysis and a worse case, as it assumes there are no benefits from demand management. Developing the aquifer and achieving a 15% saving in water use by demand management would defer the need for a dam for possibly 18 years, and result in an even lower NPV for the aquifer followed by dam construction.

A further factor to consider with building a dam now, (and probably 50% larger for the $1M additional) is that it provides a substantial volume of stored water. This negates the benefits from some of the potential demand side management initiatives.

The conclusion reached is that it is more beneficial to develop the Upper Hutt aquifer before considering a dam.

7. Consultation

The Council's 2008/9 Annual Plan indicates system enhancements will begin in 2008/9 to provide a water supply for a population of 395,000. This is achieved through implementing the first three of the short-term options. The four city water supply customers can be consulted directly about the four short-term options and the preferred dam site. In due course, public consultation can be part of the 2009-19 LTCCP.

8. Financial

Reducing the minimum flow at the Kaitoke weir requires a variation to the existing resource consent and the costs associated with this are provided for within the operational budget. If a variation is granted, adjusting the minimum flow controls is a very minor procedure.

An amount of $3M has been provided for in the 2008/9 capital expenditure programme as a contribution to a new reservoir located in Wellington City. Expenditure is spread over four years and assumes three parties contribute to the cost. Until an agreement is concluded with Wellington City Council, the decision made whether this a two-way or three-way joint project, and the scope of the project refined further, the sum provided remains as a preliminary estimate.

Constructing a pumping station on the Hutt River at Te Marua was provided for a few years ago. In the Proposed 2008/9 Annual Plan, it is noted the project is deferred a further year, with expenditure over the period 2009/12. It is now proposed to cancel this project as the benefits are similar to those that can be obtained from a minimum flow reduction at the Kaitoke weir. In the Council's 2006/7 Long Term Council Community Plan (LTCCP), it was indicated that the minimum flow reduction at the weir or the pumping station were alternative projects. Instead, it is proposed the amount of $5.9M provided for the pumping station in the 2008/16 revision of the LTCCP is reallocated to the project to increase the capacity of the Stuart Macaskill Lakes. Once the detailed analysis is completed in a few weeks, a specific project report will be submitted to the Parks, Forests and Utilities Committee. This may request some funding adjustment.

Seventy nine million dollars was provided in the 2006-16 LTCCP for a dam as a way of indicating major expenditure would be needed. The sum was not attached to a specific site. Development of the Upper Hutt aquifer, costing $16-33M was mentioned but not specifically provided for in the capital works programme. Pleasantly, the cost has now been revised to $15-19M.

At this stage, it is expected that there will be no financial provision for a dam option in the 2009-19 LTCCP capital works programme (in anticipation that sufficient demand management initiatives will be implemented to defer its need) but the Upper Hutt aquifer will be included. It would be appropriate though to indicate the preferred dam site. A small sum will be requested for the 2008/9 capital works programme to allow preliminary work on the Upper Hutt aquifer project assuming a positive outcome following consultation with the four city councils.

Increases in the water levy ranging from 7.2% to 7.8% in the years 2009/10 to 2012/13 were included in the 2006-16 LTCCP. These are expected to be reduced when the next LTCCP is prepared, given the more modest cost of the aquifer development compared with a dam.

9. Communications

In the latter part of this summer, it was necessary to request the city councils to impose a sprinkler and irrigation ban, the first such ban for at least 20 years. In early April, the Stuart Macaskill Lakes were only 41% full. Low flows in the rivers though were in the 1-in-10 to 1-in-15 year range. It is therefore timely that the Committee is being requested to approve the advancement of a number of water supply projects.

A media release can be made about the projects and the consultation following the committee meeting. Further information including answers to anticipated questions can be made available on our website.

10. Recommendations

That the Committee:

(1) ***Receives*** *the report and notes its contents.*

(2) ***Notes*** *the proposal to prepare a Regional Water Strategy in conjunction with the region's territorial authorities, which will include demand-side options that could defer the need for future water supply infrastructure.*

(3) ***Notes*** *a resource consent variation is required to source more water from the Kaitoke weir.*

(4) ***Notes*** *officers will be reporting back to the Committee following completion of initial design work to raise the maximum water level in the Stuart Macaskill Lakes.*

(5) ***Notes*** *officers will be proposing adjustments to the 2008/9 capital works programme at the June Committee meeting to be approved by the Council but these will not impact on the water levy for 2008/9.*

(6) ***Agrees*** *that the proposal for water abstraction at a pumping station on the Hutt River at Te Marua will not proceed.*

(7) ***Agrees*** *in principle that the Whakatikei dam site and associated infrastructure is the preferred site for the development of a dam, at such time as one is needed, and that action is taken to appropriately designate the site.*

(8) ***Approves*** *officers concluding a draft agreement with Wellington City Council and possibly the Capital and Coast District Health Board for joint use of a new reservoir to be built in Wellington city, and reporting back to Committee.*

(9) ***Approves*** *consultation with the four city councils about the four short-term water source development projects and selection of the Whakatikei dam site for development at such time as it may be required.*

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Attachment 1: Report on Metropolitan Wellington Water Supply Development