QUEENSTOWN LAKES DISTRICT COUNCIL

COUNCIL
27 MARCH 2014 **REF: COU140308**

Item: No. 8 – Water Metering and Supply Management Principles

Purpose – Decision Making

1 To seek Council approval of the recommended principles for water metering and supply management and direction on the recommended work programme with a view to adopting water metering in the 2015-25 Long Term Plan.

Executive Summary

2 This agenda item summarises current issues with water management in the district and discusses universal metering as a tool for water demand management. Principles of water supply management and proposed next steps have been provided as the basis for further studies.

3 The water metering study is driven by the district's comparatively high average water use to many other districts in New Zealand (687 l/person/day based on 28k resident population; 416 l/person/day based on 46k average day population). Peak day use is also high which is primarily a result of summer irrigation.

4 Improved water supply management and the introduction of metering have the potential to help QLDC manage water demand growth more efficiently and cost effectively. Metering can provide many benefits, such as reduced environmental impact, improved network management, delaying capacity driven capital works (cost savings), improved fairness and equity and consumer education.

5 Nationally approximately 50% of New Zealand's population is subject to volumetric or user pays pricing which can only be achieved through the use of individual meters for each connection.

6 Other local authorities which have introduced metering and volumetric charging have seen a significant reduction in demand. Tauranga City Council achieved an average demand reduction of 25% and a peak day reduction of 30% with the implementation of universal metering and volumetric pricing and Nelson achieved a 37% reduction in peak demand.

7 The main issue with metering is the installation costs. Increased operational costs, meter replacement costs, potential public concerns and revenue volatility also need consideration.

8 It is proposed that Council adopt a set of principles for water metering and supply management which are set out in the recommendations section of this report. These principles will help direct staff when investigating options for Council's consideration and potential inclusion in the 2015-25 Long Term Plan.

9 Further investigations will include more detailed analysis based on additional network data collected on consumption patterns, the effectiveness of existing metering in the district and financial assessments of metering costs, benefits and charging options.

Recommendation

It is recommended that Council:

1. ***Notes the content of this report, and in particular that:***
    a. ***the current level of water consumption across the District (estimated at 416 litres per person per day (average day population) to 687 litres per person per day (usually resident population)) is not sustainable relative to the capacity within the existing water supply network;***
    b. ***without reduction in the level of consumption across the District in the near future, the estimated capital cost of increasing capacity is approximately $10M in the 2012-22 LTP;***
    c. ***The single most effective means of reducing water demand across New Zealand territorial authorities has been the introduction of water metering with an average daily reduction of 25% (conservatively based on Tauranga and Nelson figures);***
    d. ***Properly implemented, water metering would not create any additional revenue for Council (or an additional rates burden on residents), but would enable the costs of water supply and management to be more equitably and transparently allocated;***
    e. ***It is estimated that, if approved in principle, the implementation of water metering across the District could commence within 1 year and would require up to 5 years to implement fully, depending on the staged implementation approach adopted.***
2. ***Adopts the following principles for water metering and supply management:***
    a. ***<u>Financial sustainability:</u> water supply must be managed in a manner that avoids financially unsustainable capital expenditure across the water supply network.***
    b. ***<u>Environmental responsibility</u>: unnecessary water demand needs to be managed in a manner that minimises avoidable adverse effects on the environment.***
    c. ***<u>Fair and equitable allocation of costs</u>: All water supply costs (both operating and capital costs) should be fairly and transparently allocated to ratepayers (i.e. without unreasonable cross-subsidisation).***
    d. ***<u>Efficient Management</u>: Water supply must be undertaken in a manner that enables the most efficient and cost-effective management of our resources and network, and therefore requires use of tools which will provide us with better information to enable this to be done.***
    e. ***<u>Cost recovery</u>: Any changes to the current form of charging for water supply must maintain the principle of cost recovery only through the reallocation of costs, and therefore avoid any windfall revenue gains.***

f. ***<u>Demonstrable cost benefits</u>: The introduction of any form of metering should only occur when the financial and other benefits of doing so demonstrably outweigh the costs of implementation.***

g. ***<u>Revenue stability</u>: Water metering must be implemented in a manner which avoids any material revenue volatility across financial years.***

h. ***<u>Complementary water management measures</u>: Alternative or additional measures to metering need to be considered as part of a water demand management strategy, including public awareness.***

3. ***Agrees in principle, subject to the matters to be identified in the proposed report, to the introduction of water metering, with the scope and nature of water metering to be part of the public consultation process in the 2015-25 Long Term Plan.***

4. ***Directs officers to report back to Council within 6 months on the following matters:***

    a. ***the order in which parts of the network should be prioritised for the introduction of water meters based on network capacity and likely capital costs and savings;***

    b. ***the net capital expenditure which could be deferred as a result of the introduction of meters in each part of the network (i.e. the capital to be expended, the capital to be deferred and the period of deferral);***

    c. ***the charging options to accompany any form of water metering and the timeframe in which the charging regime could be adopted;***

5. ***Directs officers to provide Council within 3 months such draft amendments to the Water Supply Bylaw 2008 [including clauses 7.8 (Prohibition or restriction of supply for extraordinary use); 7.15 (Prevention of waste); and 8.1 (Breaches of conditions of supply)] as are necessary to ensure that effective regulatory action can be taken in respect of excessive water use within the District.***

Prepared by Mike Heiler

3 Waters Project Manager

Reviewed and Authorised by Erik Barnes:

GM Infrastructure and Assets

Discussion

Background

10 This agenda item sets out the current issues with water management in the district, discusses universal metering as a tool for water demand management and outlines principles and further work required to progress universal metering investigations. A more detailed report, including the experiences of other local authorities, is included as an attachment.

11 The Queenstown Lakes District has high average water use comparatively to many other districts in New Zealand. Peak day use is also high which means that network upgrades are larger than would otherwise be necessary. However, the district has relatively abundant sources of water from lakes and large rivers when compared to other districts. An exception to this is the Lake Hayes scheme where abstraction puts pressure on the spring fed bores.

12 Up to this point, zone metering of trunk mains and at pump stations has been the main tool for monitoring water use. Metering of water connections in the district has been limited to a number of commercial premises in the Queenstown CBD and residential connections on some smaller schemes (Luggate and part of Lake Hayes). In addition, where water connection meters have been installed, they have been used for information only (to assess water use trends).

13 Nationally approximately 50% of New Zealand's population is subject to volumetric or user pays pricing which can only be achieved through the use of individual meters or sub-metering for each connection. This figure includes Auckland which in itself is now nearly a third of the country's population. Other districts include Tauranga, Whangarei, Tasman, Nelson, Kapiti, Central Otago and Christchurch. Note that Christchurch has universal metering but does not charge volumetrically at present.

14 Nelson determined that the additional summer water demand was being driven by outdoor sprinkler use and to cater for the high number of tourists coming into the town. Nelson identified that failure to implement water reduction measures would require 100% extra capacity to allow for summer peak use, which is only approximately 10% of the year. Nelson estimates that the utilisation of water metering has decreased water use and that water savings at peak times of over 37% have been achieved. Nelson's domestic water use is now reported as 160 litres per person per day.

15 Tauranga has a similar story where the Council has made successful efficiency gains through metering. Since the introduction of metering and volumetric charging in 2002, average per capita water consumption is 25% below levels prior to metering and per capita peak use is 30% lower.

Current Issues

16 High water use

a The Queenstown Lakes District has a high water use compared to many other districts in New Zealand. The average daily water use (per capita) across TLAs that apply volumetric charging for water supply is typically in the region of 200 litres per person per day. This contrasts with a figure close

to 700 litres per person per day (usually resident) in the Queenstown Lakes District.

b Some of this high use can be explained by the Queenstown Lakes District's high temporary population, however even when considering this, the water use for the average day population is high at 416 litres per person per day. In addition, it is likely that temporary residents will have a lower demand on water consumption per person.

17 Cost of capacity driven projects

a Capacity driven projects are those that are triggered by demand growth, putting strain on the existing network. Examples of these may include a new reservoir, a bigger pump station or bigger pipes. In the 2012 LTP, approximately $10M of capital spending was budgeted for capacity driven water supply projects.

b If water demand growth is not checked, these projects will have to take place earlier and be on a bigger scale than would otherwise be necessary.

18 Poor understanding of the 'health' of our network

a Without metering, it is difficult to understand the capacity and condition of our existing network. Therefore, maintenance activities tend to be reactive (responding to issues when they occur) rather than proactive (fixing the issues before they occur). This results in more expensive operational costs.

b In addition, the use of consumables (particularly electricity and treatment chemicals) is also relatively high as a result of more water being transported through the water supply network.

19 Limited ability to target leakage reduction

a Approximately 30% of the district's public water supply is lost to leakage. This is particularly high in Queenstown. Identifying, targeting and stopping the leakage is difficult without detailed knowledge of where water is flowing at any one time.

b Currently, we rely on installing audio loggers at locations in the network and night flow testing using bulk meters to identify leaks.

20 Catering for peak day use

a Peak day use is also high which is primarily a result of summer irrigation. As an example, the Wanaka scheme uses more than 2.5 times the amount of water on its peak day compared to its average day.

b Future expansions to the water supply network are designed for this peak day and therefore, the network upgrades are oversized for the majority of the year's demand. Reducing this peak day use will result in more cost effective upgrades.

How metering can help

21 Capital project cost savings

a The most significant benefit of demand reduction is the delaying of capacity driven projects in the future. Because overall demand is still projected to

increase with land use growth over the next 20 years, the need for additional capital expenditure will not be eliminated but costs will only occur when they are truly required.

b Based on an initial review, a sustained water demand reduction of 20% would result in deferral for up to 15 years of the $10M of capacity driven projects identified in the 2012 LTP. This will be the subject of more detailed study.

22 Environmental benefits

a There are environmental benefits to the community through water demand reduction, including:

- Minimising environmental impact through a reduction in the scope and scale of infrastructure projects.
- Reduced water abstraction from natural water bodies. This may be significant in some areas of New Zealand; however the district has relatively abundant sources of water from lakes and large rivers when compared to other districts.
- Reduced wastewater volumes. Approximately 80-85% of average day household water usage is discharged to the public wastewater system. This has a flow-on effect with regard to wastewater treatment requirements and discharge volumes.

23 Network management

a Through increased collection of data and understanding of consumption patterns, Council is able to better manage its water supply network, in particular:

- Leakage (both public and private) can be more easily identified to further reduce demand on the network.
- Planning of capital works and operational activities are improved by more accurate data and understanding of the network.
- Reduced maintenance costs are realised by decreasing the amount of reactive maintenance resulting from the improvement in planning.
- The use of consumables (particularly electricity and treatment chemicals) will also reduce as a result of less water being transported in the reticulated network.

24 Fairness and equity

a Metering also provides the opportunity to consider volumetric charging of water, although this is not an inevitable step. (Christchurch City Council has universal metering but still charges a fixed rate).

b Volumetric charging will provide further incentive to reduce household use. In addition, the element of fairness and equity is a consideration; i.e. high users pay more for their water. At present, water revenue is obtained by targeted rates which do not account for individual consumption. Volumetric charging with water metering prevents high water users essentially being subsidised by low water users.

25 Consumer education

a Consumers and Council will improve knowledge of their water use which encourages attitudinal change to water consumption. The improved data on consumption patterns can be used for education and incentive and enforcement initiatives to help reduce consumption. An example of this is penalising or limiting supply to high users by enforcement via the tools of Council plans and bylaws.

Issues with metering

26 Installation Costs

a By far the biggest hurdle to installing universal metering is the upfront capital cost. Metering of all connections is a significant investment and must be balanced against the benefits summarised above.

b Establishing the average cost of installing water meters has many variables. The most significant variable is the level of complexity of installation. In addition to capital costs of installation of the metering network, allowance needs to be made for renewals of meters.

c Initial estimates for the district indicated a potential capital cost to meter the full district of approximately $9M; however this cost requires more detailed assessment. This estimate is similar in scale to recent costs borne by Kapati District Council, which has a higher usually resident population (49,000) and therefore the initial cost estimate for our district may be conservative.

27 Operational Costs

a In addition to the capital installation costs there will be an on-going operational cost in reading the meters and managing the increased data. Additional management costs will be incurred if volumetric pricing is implemented through a more complex billing system.

b For a district of this size, a single full-time equivalent meter reader would be sufficient and therefore operating costs for meter reading would be in the order of $80,000 per year (with overheads).

28 Public concern

a A less tangible impact of universal metering is the potential for public opposition to its implementation. Water metering is often a contentious issue, raising public concern in communities across the country. Common misperceptions by members of the public who oppose water metering include that metering is a money-making exercise; that user-pays is the first step towards privatisation; that other water management tools should take priority, such as water tanks and education programmes; and that low income households would struggle to pay for water.

b Both Central Otago District Council and Kapiti Coast District Council experienced some public opposition, but have worked with their communities to overcome this and have recently implemented universal metering and volume based pricing (Kapati is currently in an implementation stage). This highlights the need for a comprehensive public education process before universal metering is implemented.

29 Revenue volatility

a The implementation of volumetric pricing also creates the risk of financial revenue instability, particularly in the short term. Revenue is linked to consumption patterns requiring a thorough understanding of consumer response to volumetric pricing to ensure cost recovery when a reduction in demand leads to a reduction in revenue.

b In addition, revenue will be impacted by climatic conditions which will vary year to year. A wet summer with corresponding low irrigation will provide lower revenue than a dry summer.

Water Metering and Supply Management Principles

30 It is proposed that the following principles are applied for Council water supply management when considering universal water metering and other supply management options:

a Financial sustainability: water supply must be managed in a manner that avoids financially unsustainable capital expenditure across the water supply network.

Capital expenditure is triggered by a combination of three factors, maintaining or raising an agreed level of service to increase capacity due to increases in demand, and to replace or renew deteriorated assets. Managing and reducing water demand is required to reduce the scale and extent of capital projects

b Environmental responsibility: unnecessary water demand needs to be managed in a manner that minimises avoidable adverse effects on the environment.

QLDC will consider the impact on the environment of its water abstraction, conveyance and disposal activities and will endeavour to minimise or avoid any adverse effects.

Reduction in water demand helps to achieve this aim by reducing the scale and nature of physical works on the network. In particular a reduction in consumption has a corresponding reduction on wastewater generation and its associated environmental impacts (volume of discharge to water, treatment requirements, energy consumption etc.).

c Fair and equitable allocation of costs: All water supply costs (both operating and capital costs) should be fairly and transparently allocated to ratepayers (i.e. without unreasonable cross-subsidisation).

The current water revenue model is not equitable as it cannot factor individual consumption and low water users are effectively subsidising high users. Therefore Council will aim to establish a model that fairly allocates costs with regard to volume of use between individual ratepayers and between different parts of the network. Coupled with this, the revenue model should have incentives and disincentives to change water-consumption practices.

d Efficient Management: Water supply must be undertaken in a manner that enables the most efficient and cost-effective management of our resources and network, and therefore use tools which will provide us with better information to enable this to be done.

The increased knowledge of water use patterns and levels through universal metering provide many benefits with regard to efficient and cost effective management of the supply network. Outcomes achieved by better information include a more targeted leakage reduction programme, better planning of maintenance activities and capital works and reduced energy and chemical costs

e Cost recovery: Any changes to the current form of charging for water supply must maintain the principle of cost recovery only through the reallocation of costs, and therefore avoid any windfall revenue gains.

Reallocation of revenue between high and low volume consumers will balance anticipated expenditure on the water supply system.

f Demonstrable cost benefits: The introduction of any form of metering should only occur when the financial and other benefits from doing so demonstrably outweigh the costs of implementation.

Universal metering and the associated reduction in water consumption must provide financial benefit to the district through deferral of capacity driven infrastructure projects as well as reductions in operational costs.

However, the financial benefits of water demand reductions needs to be assessed against the potentially significant costs of implementation as well as increased operational costs (meter reading and processing). Therefore, a robust and thorough financial cost benefit analysis of metering needs to be undertaken. This should be done at a scheme level as installation costs and financial benefits will vary from scheme to scheme.

g Revenue stability: Water metering must be implemented in a manner which avoids any material revenue volatility across financial years.

A risk of a volumetric charging based water model is revenue volatility as revenue will be linked to climatic conditions (a wet summer will have lower water consumption and corresponding decrease in revenue). Therefore, water demand forecasting based on consumer response to volumetric charging as well as climate predictions will need to be assessed carefully when developing this type of water revenue model

h Complementary water management measures: Alternative or additional measures to metering need to be considered as part of a water demand management strategy.

Metering as a water demand management tool should be complemented by alternative/additional measures including public awareness (education) and regulatory enforcement (through the Water Supply Bylaw).

Proposed Next Steps

31 The following actions are proposed for investigating water supply management, universal metering and charging. These will be the subject of further investigation and discussion in the lead up to the 2015-25 Long Term Plan.

32 Identify high water users

a Before consideration of universal metering, it is necessary to understand whether there are particular high water users who can be targeted for specific water demand management measures.

b Identification and classification of these high water users will require a number of tools to be used such as GIS analysis of property types and sizes, existing metering information (particularly network metering), anecdotal evidence and inspections.

c A media statement is proposed to outline steps Council is taking to identify high water users in the district and communicate the need to reduce consumption.

33 Continue with non-metering water demand initiatives

a Non-metering water demand initiatives include education, promotions and Council water demand management. Ideally these will be continued to provide the ability to assess benefits over multiple years. This information will be used to refine and calibrate the cost-benefit models.

34 Review the capacity driven projects

a A more detailed review of the capacity driven water supply projects in the Long Term Plan is required to confirm the assumptions of deferral that can occur through water demand reduction. This may require additional hydraulic modelling against various scenarios of demand growth based on peak day flows.

35 Assess universal metering costs

a Investigation of the likely complexity of meter installations and quantification of costs is required, particularly in Queenstown and Wanaka with their more urban environments. This will involve review of GIS records, site walkovers and more detailed pricing. In addition a review of operational options is required when considering volumetric charging (e.g. automatic vs manual metering reading, billing methods, reading frequencies etc.).

36 Review alternative strategies

a Before embarking on universal metering of the whole district it will be necessary to assess the costs and potential benefits of alternative strategies for water supply management. Examples of these may include:

- Installing metering on a scheme by scheme basis to both stagger the capital costs and target the easier schemes first.
- Investigate the advantages of targeted metering (and potentially volumetric charging) to those high water users identified in Action 1.
- Reviewing and using the Water Supply Bylaw to regulate and penalise high water users.
- Installation of water supply restrictors (physical restrictors at the point of supply) to high water users, potentially coupled with property water tank storage.
- Application of seasonal restrictions, as per the Lake Hayes scheme.

37 Develop a communication strategy

a Community education requirements need to be considered if the decision to implement universal metering is made. It is likely that there will be mixed

reactions to the project which will require a carefully managed implementation process.

b Drawing on the experience of other local authorities that have implemented universal metering (and volumetric pricing) will be very helpful in this instance to understand challenges they faced with community opposition.

38 Determine the longterm metering option and implement for new developments

a This will potentially be accomplished through both the District Plan and Water Supply Bylaw revisions, with further consultation being undertaken through the 2015-25 Long Term Plan.

Local Government Act 2002 Purpose

39 The author has reviewed Section 10 of the LGA. This matter gives effect to the purpose of local government because:

Activity (local democracy, infrastructure, local public services, or performance of regulatory functions)	The consideration of universal metering relates directly to the provision of core local infrastructure. This will include taking steps to determine the most efficient and cost-effective options for water supply management in the district.
Quality (efficient, effective and appropriate to present and future circumstances)	
Economic (most cost-effective for households and businesses)	

Significance of Decision

40 The author has reviewed the Significance Policy. The report recommendation is not significant under the Council's Policy on Significance for the following reasons:

a No unbudgeted expenditure will result from the recommendations in this report.

b The principles and actions outlined are provided as bases for progressing further studies and, as such, do not affect ratepayers.

c A revision of the Water Supply Bylaw is proposed however this does not constitute a change to existing policy.

Consultation - Interested or Affected Persons

41 No consultation or communication has been undertaken prior to consideration of this item. Consultation with the community will be required when decisions are required as to the direction of water metering in the district. This will likely take place as part of the 2015-25 LTP process.

42 It is proposed that a media release be drafted to inform ratepayers of Council investigations into high water users in the district, as outlined in Paragraph 30c.

Relevant Council Policies and Plans

43 The following Council Policies and Plans were considered for this report:

a Council's Policy on Significance – see 'Significance of Decision' section above.

b The Water Asset Management Plan – the status of current water usage and forward works plans.

c The Water Demand Management Plan 2012/13 - a review of information, actions and data on water usage were utilised.

d Water Supply Bylaw 2008 and the existing capability to provide incentives and penalties with regard to water consumption.

Risk Management

44 Not applicable.

Attachments

A Universal Water Metering as a Tool for Water Supply Management report, February 2014