

ACHIEVING SUSTAINABLE MUNICIPAL WATER SUPPLY THROUGH INTEGRATED WATER AND LAND USE PLANNING

*P. Hunter and C. Scrafton, MWH New Zealand Ltd
T. Harty and L. Brown, Hamilton City Council*

ABSTRACT

There is an increasing demand for water especially from agribusiness, electricity generators and urban growth. In 2010, the majority of consumptive weekly allocations were for irrigation (46 percent) and hydro generation (41 percent) with the remainder shared among public drinking supply, industry and stock watering. An increasing number of catchments are either over-allocated or nearing full allocation. By 2012 it is predicted that freshwater resources in our most economically significant regions will be fully allocated to users. The effects of climate change are only going to exacerbate this situation particularly in eastern parts of New Zealand where droughts are predicted to increase. The demand for water is outstripping supply. All these factors are going to make it increasingly difficult for councils and municipal suppliers to protect existing supplies for municipal water and secure additional supplies to provide for the long term growth of towns and cities.

To ensure that councils and municipal suppliers can continue to obtain water to provide for municipal supply to accommodate existing and future economic and social needs of communities, central and regional government must recognise the importance of municipal supply. Central and regional government regulatory frameworks need to prioritise allocation of water for critical activities such as municipal supply.

However, with such privileges come responsibilities for councils and municipal suppliers to justify the volumes of water required for municipal supply and to ensure it is efficiently and effectively used. To achieve these outcomes councils need to better integrate water and land use planning. This integration needs to occur throughout the various planning and development stages including ensuring growth strategies appropriately consider and identify future water allocation requirements, ensuring structure plans and local area plans etc. incorporate integrated catchment management planning and water assessments, and ensuring large scale subdivision and land use applications identify water use requirements and adopt efficient use mechanisms and devices.

District plans can be very effective tools for achieving water and land use planning integration. However, currently their potential for achieving such outcomes has largely been overlooked. Hamilton City Council's approach to its District Plan Review provides a useful case study on the various methods that can be incorporated into a district plan to integrate water and land use planning. These methods are not only designed to achieve the efficient use of water, but also result in a range of other benefits including improving water quality and the health of catchments, enhancing amenity values, assisting with climate change adaptation, improving biodiversity, and protecting natural character.

KEYWORDS

Water allocation, efficient use, municipal water supply, integrated water and land use planning, district plans.

1 INTRODUCTION

Past generations have grown up with the idea that New Zealand would always enjoy an abundance of clean water. In recent times, however, it has been recognised that the resource is not infinite and needs to be managed

carefully. The significant increase in recent years in the volume of water allocated in New Zealand underscores the urgency of balancing the competing needs of water users including industrial users, recreational users, municipal water suppliers, iwi, electricity generators, irrigators, etc. while maintaining the health of the aquatic habitat.

Water quality in many parts of New Zealand is declining across a number of indicators and is a key concern in terms of the state of New Zealand's environment (Ministry for the Environment 2007).

The perception that New Zealand is a water rich country, and there is enough water to provide for all needs has resulted in a lack of strategic long term planning for the allocation and efficient use of water. This lack of strategic planning, coupled with the failure to recognise the critical importance of water for municipal supply is in a number of cases making it difficult for municipal suppliers to secure long term supplies of water for their communities and to provide for future growth.

With the ever increasing demand for water, this situation is not going to improve for municipal suppliers unless the importance of water for municipal supply is recognised and prioritised ahead of other water users in Resource Management Act ("RMA") planning instruments. However, to support this prioritisation, municipal suppliers will clearly need to justify the volume of the water they require and demonstrate that once allocated they will use it efficiently and effectively.

2 INCREASING DEMAND FOR WATER

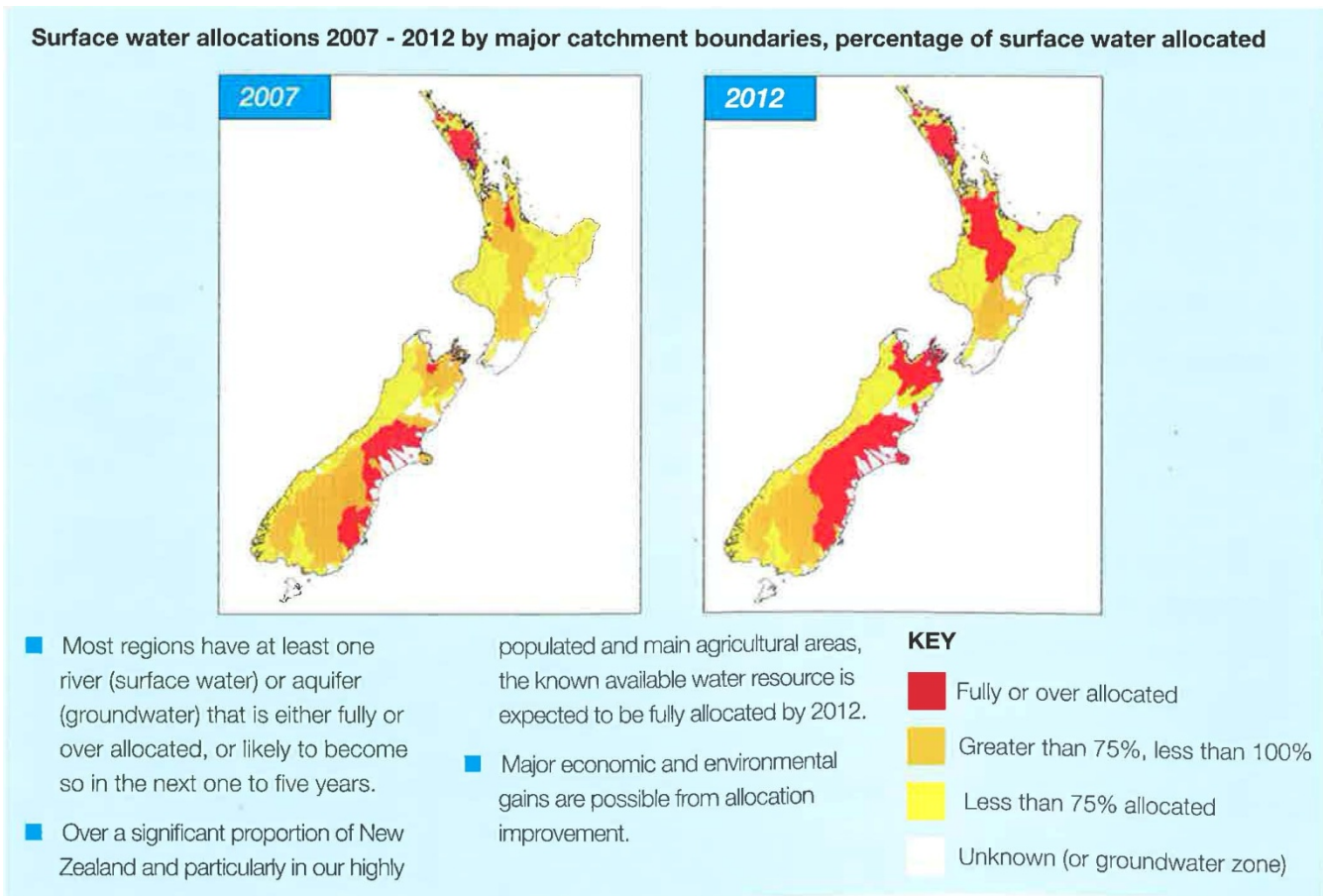
As illustrated in Figure 1 below, by 2012 it is predicted that freshwater resources in our most economically significant regions will be fully allocated to users on what under the RMA is a first-in, first served basis. Between 20-80% of water allocated is unused depending on factors such as the time of year and crop type (New Zealand Business Council for Sustainable Development 2008). In many instances water has been allocated with limited or no requirement to justify the need for the water or to demonstrate if and how the water will be used efficiently. These allocation trends and practices are becoming untenable and are resulting in increasing conflict between competing demands, including demand for water for municipal supply.

Demand is being driven by more intensive land use, irrigation particularly for agriculture and a growing population which is driving demand for electricity and municipal supply. In 2010, the majority of consumptive weekly allocations were for irrigation (46 percent) and hydro generation (41 percent) with the remainder shared among public drinking supply, industry and stock watering (Ministry for the Environment 2011). The allocation of water in New Zealand is growing significantly. Between 1999 and 2010 allocation of freshwater (to uses such as irrigation) nearly doubled, and in the last four years increased by 10 percent (Ministry for the Environment 2011).

The impact of climate change is expected to exacerbate the problem of availability and demand for water. This is because likely impacts of climate change include higher temperatures, more frequent extreme weather events such as droughts (especially in the east of New Zealand) and floods, and changes in rainfall patterns with higher rainfall in the west and less in the east. These changes will from a water demand and availability perspective result in (Ministry for the Environment 2008):

- risk of drought and reduction in availability of water corresponding with an increasing demand for water for irrigation particularly in eastern areas.
- people are likely to enjoy the benefits of warmer winters with fewer frosts, but hotter summers will bring increased risks of heat stress and corresponding increases in demand for water.
- drier conditions in some areas are likely to be coupled with the risk of more frequent extreme events such as floods, droughts and storms.
- snowlines and glaciers are expected to retreat and change water flows in major South Island rivers which could influence the availability of both surface and ground water.

Figure 1: Percentage of surface water allocated



Source: *Best Use Solution for New Zealand's Water Problems*, New Zealand Business Council for Sustainable Development, 2008

3 CURRENT REGULATORY FRAMEWORK FOR WATER MANAGEMENT

The regulatory environment for the management of water is established under the RMA. A national policy statement, national regulations and environmental standards, numerous regional policy statements and regional plans have been developed under the RMA with the intent of sustainably managing New Zealand's water resources.

The most recent and long awaited addition to the regulatory tool kit has been the much heralded Freshwater National Policy Statement ("Freshwater NPS") which came into force on 1 July 2011. Unfortunately the document fails to provide any significant clear national guidance on managing the water resource, particularly in terms of prioritisation of water use and how water quality standards should be set. These matters are left to regional councils to determine. In addition the compliance period of 2030 relates to the inclusion of policies and methods in plans to prevent over allocation and further contamination of water bodies and not the actual achievement of such outcomes in the environment.

The RMA devolves decision making on the allocation and use of water and the ability to discharge contaminants into water to regional councils. The regulatory context for guiding this decision making is provided by regional policy statements and regional plans. While some regional councils have used these planning instruments to signal the need to provide for, protect and prioritise water for municipal supply (e.g. Auckland, Waikato, Tasman¹, Southland) other councils have failed to recognise the importance of ensuring the availability of water for municipal supply in their planning instruments. Unfortunately, in some cases where councils (Waikato and Tasman) have sought to prioritise water takes for municipal supply there has been significant opposition from

¹ It is noted that Tasman is a Unitary Authority

other users (e.g. electricity generators, agribusiness, industry, iwi etc.) culminating in protracted and costly appeals to the Environment Court.

While some district plans include provisions relating to managing the effects of land use on water quality, to date there has largely been limited recognition of the opportunities these planning instruments provide in achieving much greater integration of water and land use planning and the resulting benefits in terms of water quantity and efficient use.

4 IMPORTANCE AND UNIQUENESS OF MUNICIPAL SUPPLY

Water is an essential and irreplaceable commodity without which living beings cannot survive. Safe, reliable and secure potable water supplies are fundamental for the social and economic well being communities in our towns and cities and for their health and safety.

Local authorities and municipal suppliers have a range of functions and responsibilities under the Local Government Act 2002 (“LGA 02”) and other legislation including (Harty, T 2010):

- a) Specific responsibilities with respect to the supply of water for the purposes of drinking water, health and fire fighting; and
- b) The general responsibilities and powers of local authorities to promote and maintain the wellbeing of the people and communities of their districts which include:
 - the maintenance and enhancement of amenity values and the environment in urban areas which in turn improves the quality of life for residents,
 - facilitating the establishment and ongoing operation of businesses and industries which provide jobs and drive the economies of towns and cities.

Municipal water supply schemes provide water for an extensive range of activities, including hospitals, schools, correctional facilities, fire fighting, public sanitary facilities, public facilities and amenities, businesses and household use. Demands on such schemes and community expectations are far more complex than simply the provision of water just to meet drinking and sanitation needs.

The role of local authorities and municipal suppliers is more important than any other user, as they provide services which no other body would or could provide. They are also the only water takers required to treat such large quantities of water to a potable standard for community purposes. Local authorities and municipal suppliers also represent the interests of water users connected to municipal supply networks, including ensuring they have access to an adequate supply.

Local authorities need to plan for growth in their cities and districts and municipal suppliers need to account for that growth planning in managing their networks. The economic and social wellbeing of the community is inextricably linked with the ability to take water for municipal supply, including commercial / industrial uses. The unique characteristics of municipal suppliers’ infrastructure also set them apart from most other water takers, particularly insofar as investments are long term, upgrades cater for long term interests, infrastructure varies in quality, maintenance is ongoing and funds have to be raised via the Long Term Plan and Annual Plan processes (Harty2010).

Unfortunately, particularly at the national level there is a lack of recognition and understanding of the critical importance of water for municipal supply and the unique characteristics of municipal supplier’s infrastructure and responsibilities. Where recognition is afforded to the importance of municipal supply it is often only seen in a narrow sense – that of drinking water and water required for sanitation. There is a general failure to recognise the critical contribution municipal supply makes to the liveability of our towns and cities and how fundamental a safe and secure water supply is for the businesses and industries that provide employment and goods and services for urban communities.

5 CHALLENGES FOR MUNICIPAL SUPPLIERS

The challenges for municipal suppliers in terms of protecting existing sources of water for municipal supply and securing new water sources to accommodate growth are only going to increase and get more difficult unless regulatory frameworks at both national and regional levels recognise the importance of municipal supply and prioritise water or application to take water for municipal supply purposes. These challenges are a result of:

- a) Increasing competition for water, particularly from the continued expansion of agribusiness.
- b) Less and less water available as catchments reach full allocation, or are over allocated and in the longer as the effects of climate change especially in the eastern areas of the country increase.
- c) Increasing opposition by other users such as agribusinesses and electricity generators to supportive regulatory frameworks for municipal supply in regional planning instruments and to applications to take water for municipal supply.
- d) Increasing focus on water allocation to the “highest value use” in terms of direct contribution to the New Zealand economy and GDP and the failure to recognise the important contribution municipal supply makes to the liveability and to amenity of our towns and cities along with the social and economic wellbeing of urban communities.
- e) Arguments put forward by competing water users to only provide for the drinking water and sanitation components of municipal supply.

To address these challenges and to ensure the ability to secure sufficient water to provide for the long term needs and growth of urban communities, councils and municipal suppliers must:

- a) At a national level actively lobby to ensure the unique requirements and responsibilities of municipal suppliers are clearly understood and promoted by central government and organisations such as the Land and Water Forum. Indications are that the Minister for the Environment intends to undertake a review of the Freshwater NPS in the next few years. This review will provide an important opportunity to secure favourable provisions supporting municipal supply and the need to prioritise water for such a critical and unique use.
- b) At a regional level seek to ensure regional councils understand the unique requirements and responsibilities of municipal suppliers and make appropriate provision in their regional policy statements and regional plans for the prioritisation of water for municipal supply. Should regional councils fail to include such provisions in their regional planning instruments councils and municipal suppliers need to work collaboratively in lodging submissions on regional policy statements and regional plans to ensure these documents deliver the regulatory frameworks required to secure sufficient water to provide for the long term needs and growth of urban communities.

However, seeking to secure favourable regulatory status such as prioritisation for municipal supply must come with responsibilities to ensure that the volumes of water sought have been appropriately justified by sound and robust growth planning and that once the water has been allocated it is used as effectively and efficiently as possible. It is therefore critical that councils and municipal suppliers adopt best practice water conservation and demand management practices and more effectively integrate responsibilities for land use planning and water planning. This is an area of council planning and implementation that has considerable potential to achieve significant ongoing efficiencies in the use of water and that is generally overlooked or not recognised.

In recent times councils have become more aware of the need to integrate water and land use planning, particularly in terms of adopting “green technologies” “water sensitive design” “low impact design” “integrated three water practices” etc. to achieve improved stormwater management and water quality outcomes. However, the benefits of integrated water and land use planning for achieving improved water quantity outcomes have not been recognised to the same extent. This is why there is a need to consider water and land use planning

integration in a more holistic sense and incorporate all three waters (stormwater, water supply and wastewater) to achieve more efficient use of water and minimise the generation of wastewater.

6 INTEGRATED WATER AND LAND USE PLANNING

By integrating water and land use planning councils can better manage the effects of land use and land use change on both water quality and water quantity. Integrated water and land use planning needs be undertaken at regional, sub regional, catchment, neighbourhood and site levels.

Previously growth planning particularly at a regional or sub-regional level has been driven by demographics and land suitability with little regard to the availability of a secure long term water source to support planned growth. Assumptions were generally made that there would always be an available and abundant supply of water to satisfy growth needs. However, given the increased competition for water and that an increasing number of catchments are reaching full allocation, future water sources should be a fundamental consideration in any growth planning exercise. Where future growth is projected in water short areas, such growth needs to be robustly justified along with projected water requirements. Future water requirements that have been well researched and are evidence based will assist councils in protecting and securing future water sources to accommodate growth. Without comprehensive growth planning that takes into account future water requirements, councils may well struggle to secure long term supplies of water for municipal needs, let alone obtain water from existing users where catchments have become over-allocated.

From a regulatory perspective the management of water quantity in terms of allocation and use has been the responsibility of regional councils. Increasingly, regional councils are becoming more and more concerned with ensuring that if water is to be allocated then the volumes sought must be clearly justified and that once the water is allocated it will be efficiently and effectively used. Consequently, as discussed above councils and municipal suppliers will need to undertake comprehensive growth planning to support volumes sought for takes for municipal supply. They will also need to provide clear evidence of the measures adopted to ensure the efficient and effective use of the water allocated.

Traditional methods to demonstrate commitment to efficient use of water have focussed on water conservation and demand management strategies and plans. These mechanisms have a focus on network maintenance (leak detection, pressure reduction), economic instruments (water metering, wastewater charging), water efficient technologies (rainwater tanks, appliances and plumbing fixtures, greywater reuse), education and regulation. While these mechanisms are being very successfully applied with the increase in competing demand for water, reduced availability of water and in some cases significant litigious opposition to municipal takes, councils will need to consider other mechanisms for achieving the efficient use of water.

Councils need to consider utilising other tools to assist them in designing their towns and cities to minimise inefficient water uses, maximise reuse opportunities and manage the urban water cycle as a single system. A critical tool which has previously been under-utilised in achieving these outcomes is the district plan. A limited number of councils have used their district plans to require the installation of rainwater tanks and greywater reuse (e.g. Kapiti Coast District Council). However, the opportunity exists through district plans to achieve a holistic approach to water management by adopting more integrated approaches to water and land use planning.

7 ROLE OF DISTRICT PLANS IN ACHIEVING INTEGRATED WATER AND LAND USE PLANNING

There are a range of matters that district plans can address and mechanisms they can adopt to integrate water and land use planning and these are discussed below. Many of the matters and mechanisms are inter-related and will achieve multiple benefits in addition to managing water demand, efficient use of water and improving water quality and the health of catchments. Additional benefits include enhancing amenity values, assisting with climate change adaptation, improving biodiversity, and protecting natural character.

7.1 ENSURING ADEQUATE SUPPLY OF WATER TO SUPPORT GROWTH

There has been criticism both nationally (Appellants to Variation 6 Water Allocation and Use to the Waikato Regional Plan) and internationally (Arnold, CA 2005, McKinney, M 2003) as to whether appropriate consideration is given to the availability of water to adequately supply areas identified for future growth. It is important to ensure that district plans addresses this matter. An assessment of water requirements and water availability should be made as part of any structure planning process for greenfield developments, or as part of the local area planning process or other mechanisms adopted by the district plans to manage the redevelopment of brownfield areas for particularly for intensification.

Best practice would be to ensure the availability and security of a reliable and secure water supply prior to any rezoning for urbanisation or intensification. Provisions could be included in district plans requiring as part of any structure planning process or local area etc. planning process for the provision of information regarding the water supply requirements for the area concerned and evidence of the availability of water to supply these requirements.

It is also important for land use and water planning purposes to understand the impacts of significant developments such as large subdivisions, large commercial and industrial developments, medium and high density residential developments etc. on existing water supplies. District plans could assist with this by requiring applications for such developments to be supported by “water assessments” that could include information on such matters as proposed land use activities, projected water use by individual activities, incorporation of water conservation, reuse and recycling devices, adoption of green technologies, impervious surfaces, landscaping selection, water saving targets and key performance indicators, monitoring, auditing benchmarking etc. District plans would need to establish criteria to determine what types of activities would be subject to the provision of “water assessments” and the matters to be addressed in a “water assessment”.

District plans have a key role in managing “high water use” industries. This role could involve including rules limiting the use of water by a single industrial activity. Failure to comply such rules could require “high water uses” to go through a resource consent process and provide council with the discretion to consider the availability of a reliable water supply and the efficient use of water. Applications would need to be supported by a “water assessment”.

7.2 CATCHMENT BASED PLANNING

District plans should take a catchment based approach to land use planning. This would greatly assist in achieving integrated catchment management, the integrated management of the effects of land use on water quality and quantity, and holistic approaches to the management of the hydrological water cycle. District plans should take a more catchment based approach to land use planning. To facilitate better catchment based planning, a greater understanding is required of the effects of land use proposals on the health and well being of the catchments within which activities are proposed to be located.

The structure planning process for greenfield development and the local area planning process or other mechanisms adopted by district plans to manage the redevelopment of brownfield areas for intensification are critical stages for the consideration of catchment based planning and the integration of the hydrological water cycle. District plans should include provisions requiring as part of the structure plan, local area plans etc. development process consideration of how the catchment within which development will be located functions. Such considerations could include – the current state of health of the catchment, natural systems, processes and open space that provide benefits in terms of flood control, water filtration and ground water recharge, the location of any sensitive receiving environments and how development will affect these systems, processes, areas and environments.

District plans should also include provisions relating to:

- protecting natural and manmade features that act as water holding areas or reservoirs such as stream beds, gully systems, recreation areas, ponds and other ecosystem services etc. that serve to recharge ground water, reduce runoff, improve water quality and decrease flooding.
- protecting flood plains.
- restricting development and obstruction to overland flow paths.

- restricting the establishment of impervious surfaces over recharge arrears.
- restricting development of activities involving the storage and use of hazardous substances over recharge areas, aquifers or areas that drain into sensitive receiving environments.
- protecting and enhancing riparian planting.

It is also important that consideration be given to understanding the role and function of catchment management plans, how they relate to district plans, how district plans can support them and how they can support district plans.

7.3 DEMAND MANAGEMENT AND EFFICIENT USE OF WATER

District plans provide opportunities to manage land use in a manner that assists in achieving the efficient use of water. Mechanisms that could be incorporated into district plans include:

- restricting activities that have the potential to generate high water usage – e.g. large lot residential subdivisions (landscaping irrigation requirements).
- restricting high use industries unless they demonstrate the availability of an adequate and reliable water supply and efficient use of water.
- requiring applications for large scale developments requiring the supply of significant volumes of water to provide water assessments.
- Requiring dual plumbing that allows greywater from showers, sinks and washers to be used for landscape irrigation and toilet flushing and other possible non potable uses to be included in the infrastructure for new developments.
- requiring rainwater tanks for landscape non potable household use e.g. toilet flushing and landscape irrigation to be included in the infrastructure for new developments.
- Where district plans require provision of landscaping areas also include provisions requiring all aspects of landscaping from the selection of plants to soil preparation and the installation of irrigation to be designed to reduce water demand, retain runoff, decrease flooding and recharge ground water.

7.4 MANAGING EFFECTS ON WATER QUALITY

Adopting an integrated approach to water and land use planning will assist in improving water quality and catchment health. Managing the effects of land use on water quality is an important function for district plans. As discussed above, the structure planning (greenfields) and local area planning etc. (brownfields / intensification) are critical stages in the planning of development as these planning tools identify where activities are located and how they can be managed to protect and enhance water quality. District plans should include provisions requiring as part of the structure plan, local area plans etc. development process consideration of:

- how natural resources such as wetlands, riparian vegetations, gullies, water bodies etc. will be protected for water quality improvement and overall long-term resource sustainability;
- how the use of natural processes / green infrastructure can be maximised to protect water quality; and
- where and how activities will be located and management to avoid any adverse effects on water quality.

At the subdivision, comprehensive development, resource consent stages district plans should require where practicable that adoption of green technologies including swales, stormwater retention ponds, rain gardens etc. Where applicants considered it is not feasible to adopt such approaches district plans should require provision of evidence to support their position.

District plans should also seek to minimise the use of impervious surfaces for driveways, streets, parking areas etc. so that land is available to absorb stormwater, treat contaminants, recharge ground water and reduce flooding.

7.5 EFFICIENT AND EFFECTIVE PROVISION OF INFRASTRUCTURE

District plans includes provisions that control the establishment and installation of infrastructure including infrastructure associated with the treatment and reticulation of water, wastewater and stormwater. Where the

installation and operation of any three waters infrastructure and associated activities will have only minor effects on the environment, district plans should place minimal controls on these activities. Any earthworks provisions should not compromise the efficient installation of any linear infrastructure such as pipe networks.

As part of any district plan review process, an analysis should be undertaken to remove any unnecessary barriers to the effective and efficient provisions of green infrastructure and technologies (including recycling and reuse). Consideration should be given to the development of methods to incentivise the adoption of these technologies in existing developments.

8 HAMILTON CITY COUNCIL DISTRICT PLAN CASE STUDY

In 2009, the Waikato Regional Council granted Hamilton City Council a 35 year resource consent for a water permit to take water from the Waikato River for the purpose of municipal supply. The consent contained a number of conditions relating to monitoring, reporting and reviewing the effectiveness of actions adopted by Hamilton City Council in respect of water conservation and demand management and implementing water savings targets and key performance indicators. The consent conditions also required Council to report on other methods adopted by Council to achieve the efficient use of the water allocated by the permit.

While Hamilton City Council has a comprehensive Water Conservation and Demand Management that supported its water take application and that contains the actions numerous actions to implement water conservation and demand management measures, Council considered it important to investigate a range of other methods to achieve efficient and effective use of water. One of the key methods identified to achieve this outcome was its District Plan. Council then embarked on an exercise to identify the various mechanisms and approaches the district plan could adopt to achieve the efficient and effective use of water (Hunter, PM 2011). This exercise highlighted the opportunity for the District Plan to take an integrated approach to water and land use planning and also identified a much broader range of benefits from such an approach. These benefits included not only the efficient use of water, but also improving water quality and the health of catchments, enhancing amenity values, assisting with climate change adaptation, improving biodiversity, and protecting natural character. One of the recommendations of this investigation was the need for the District Plan to include a Water Chapter. As Hamilton City Council is currently undertaking a Review of its District Plan a Water Chapter is able to be incorporated into the Plan as part of the Review process.

8.1 DISTRICT PLAN WATER CHAPTER

The recommendation that the District Plan Review includes a standalone Water Chapter is based on the following:

- The significant issues associated with the ongoing availability of water for municipal supply, particularly due to the competing demands for water in the Waikato River Catchment.
- Council's water permit consent conditions.
- Council's recognition of the need to better integrate water and land use planning.
- Water quality issues and the health and well being of the Waikato River.
- The statutory, policy and strategic drivers.
- The Waikato River Settlement Act 2010 and the Vision and Strategy for the Waikato River.
- Hamilton is New Zealand's fourth largest city and is located on New Zealand's longest river and one of the most iconic rivers.

In addition, the Assumptions that the Council has developed to guide the District Plan Review project include that the District Plan will *"reflect best practice plan making"* and that *"innovative approaches will be adopted where ever possible, but the approaches must be sound and defensible"*. The inclusion of a standalone Water Chapter in the District Plan Review is an innovative approach that is clearly support by sound and robust statutory, policy and strategic drivers. In addition it demonstrates that the Council is dedicated to showing

leadership and commitment to the integration of land use and water planning and setting a clear direction for addressing the effects of land use on the health and well being of the Waikato River.

The proposed Water Chapter is structured as follows:

- Establishment of a clear and directive policy framework (objectives and policies) to achieve the integrated management of water and land use in Hamilton City.
- Methods (rules) to achieve the development of a built environment designed to achieve the efficient use of water and to manage the use and development of land so as to avoid adverse effects on water quality.
- Requirements for structure plans, local area plans, large scale subdivisions and significant developments to incorporate integrated catchment management plans and water assessments.
- Identification of significant cross boundary issues associated with the integrated management of water and land use in the Waikato River Catchment and processes for dealing with these issues.
- Cross references to methods in other chapters of the District Plan dealing with the integrated management of land use and water.
- Identification of catchment and sub-catchment boundaries on Planning Maps.

8.2 POLICY FRAMEWORK

As set out above, the District Plan Review needs to establish a clear and directive policy framework (objectives and policies) for the integrated management of water and land use planning in Hamilton City. Matters addressed in the framework include:

- Promoting catchment based planning and the integration of the hydrological water cycle through structure planning (greenfield), local area planning etc. (brownfield / intensification) processes and through subdivision and resource consent processes.
- Ensuring an adequate supply of water is available to support future growth and that “high water use industries” demonstrate the availability of an adequate and reliable water supply and efficient use of water prior to establishment in the City.
- Managing the effects of land use and development in a way that:
 - protects water quality.
 - conserves water resources.
 - result in efficient water use.
 - sustains healthy catchments.
 - protects the natural functioning of catchments.
 - minimises flood risk.
- Promoting the adoption of green infrastructure and technologies and reuse and recycling devices.

8.3 METHODS

Proposed methods to be adopted by the District Plan Review to effectively and efficiently implement the above policy framework include:

- Identification of natural and manmade areas, features that serve to recharge ground water, reduce runoff, improve water quality and decrease flooding etc. and the protection of these resources from effects and land use and development.
- Inclusion of rules that require “high water use industries” demonstrate the availability of an adequate and reliable water supply and the mechanisms to be adopted to ensure efficient use of water.
- Identification of land uses and activities that have the potential to use water inefficiently and inclusion of rules that either restrict their establishment or avoid inefficient water use.
- Review existing rules relating to impervious surfaces and rules relating to the provision of activities that use impervious surfaces to determine methods for reducing impervious surface cover.

- Inclusion of rules requiring new developments to incorporate water conservation, reuse and recycling infrastructure and devices.
- Where rules require landscaping areas to be provided, to also include provisions requiring all aspects of landscaping from the selection of plants to soil preparation and the installation of irrigation to be designed to reduce water demand, retain runoff, decrease flooding and recharge ground water.
- Inclusion of rules requiring that any structure plan process (greenfields) and any local area plan etc. (brownfields / intensification) process address the following:
 - water supply requirements for the area concerned and the land uses and activities to be provided for and evidence of the availability of water to supply these requirements.
 - how the catchment within which development will be located functions, its current state of health, natural systems, processes and open space that provide benefits in terms of flood control, water filtration and ground water recharge, the location of any sensitive receiving environments and how development will effect these systems, processes, areas and environments.
 - how natural resources such as wetlands, riparian vegetations, gullies, water bodies etc. will be protected for water quality improvement and overall long-term resource sustainability;
 - how the use of natural processes / green infrastructure can be maximised to protect water quality.
 - where and how activities will be located and management to avoid any adverse effects on water quality.
 - protection of flood plans and overland flow paths.
- Inclusion of rules requiring applications for significant developments (e.g. large subdivisions, comprehensive development areas, large commercial and industrial developments, medium and high density residential developments) to be supported by “water assessments” to determine the effects of the proposals on water supplies and identify mechanisms to achieve the efficient use of water. The assessments should include information on such matters as:
 - proposed land use activities;
 - projected water use by individual activities;
 - incorporation of water conservation, reuse and recycling infrastructure and devices;
 - adoption of green technologies;
 - extent of impervious surfaces;
 - landscaping selection and irrigation needs;
 - water saving targets and key performance indicators, monitoring, auditing benchmarking etc.
- Inclusion of rules requiring large scale subdivisions, comprehensive developments and other significant developments requiring resource consents to adopt where practicable green technologies including swales, stormwater retention ponds, rain gardens etc
- Use of Design Guides to support methods designed to:
 - protect water quality
 - conserves water resources
 - achieve efficient water use
 - sustains healthy catchments
 - protect the natural functioning of catchments
 - minimises flood risk
- Inclusion of catchments and their boundaries on planning maps.
- Inclusion of monitoring and reporting requirements to determine the efficiency and effectiveness of policies, rules, or other methods to achieve the integrated management of water and land use.

9 CONCLUSIONS

There is an increasing demand for water especially from agribusiness, electricity generators and urban growth. There are an increasing number of catchments that are over-allocated or nearing full allocation and the effects of climate change are only going to exacerbate this situation particularly in eastern parts of New Zealand where

droughts are predicted to increase. The demand for water is outstripping supply. All these factors are going to make it increasingly difficult for councils and municipal suppliers to protect existing supplies for municipal water and secure additional supplies to provide for the long term growth of towns and cities.

Indications are that applications for resource consents for water permits to take water for municipal supply are increasingly going to draw oppositions from competing users, particularly in catchments that are over-allocated or nearing full allocation. Many of these competing users are well resourced and sufficiently motivated to take appeals to the Environment Court and higher Courts to protect their existing allocations and secure access to new water sources

To ensure that councils and municipal suppliers can obtain water to provide for municipal supply to accommodate existing and future economic and social needs of communities, central and regional government must recognise the importance of municipal supply and the uniqueness of councils' and municipal suppliers' responsibilities and infrastructure. Central and regional government regulatory frameworks need to prioritise allocation of water for critical activities such as municipal supply or prioritise water permit applications for municipal supply.

However, with such privileges come responsibilities for councils and municipal suppliers to justify the volumes of water required for municipal supply and to demonstrate how once the water has been allocated, they will ensure it is efficiently and effectively used. To achieve these outcomes council need to better integrate water and land use planning. This integration needs to occur throughout the various planning and development stages including ensuring growth strategies appropriately consider and identify future water allocation requirements, ensuring structure plans and local area plans etc. incorporate integrated catchment management planning and water assessments, and ensuring large scale subdivision and land use applications identify water use requirements and adopt efficient use mechanisms and devices.

District plans can be very effective tools for achieving water and land use planning integration. However, currently their potential for achieving such outcomes has largely been overlooked. Hamilton City Council's approach to its District Plan Review provides a useful case study on the various methods that can be incorporated into a district plan to integrate water and land use planning. These methods are not only designed to achieve the efficient use of water, but also result in a range of other benefits including improving water quality and the health of catchments, enhancing amenity values, assisting with climate change adaptation, improving biodiversity, and protecting natural character.

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