BEFORE THE AUCKLAND UNITARY PLAN INDEPENDENT HEARINGS PANEL

IN THE MATTER	of the Resource Management Act 1991 and the Local Government (Auckland Transitional Provisions) Act 2010
AND	
IN THE MATTER	of Topic 080 Rezoning and Precincts (General) and Topic 081 Rezoning and Precincts (Geographical Areas)
AND	
IN THE MATTER	of the submissions and further submissions set out in the Parties and Issues Report

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STATEMENT OF EVIDENCE OF MARK DOUGLAS BOURNE ON BEHALF OF AUCKLAND COUNCIL

WATERCARE SERVICES LIMITED

3 DECEMBER 2015

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1. SUMMARY

1.1 This statement of evidence is part of Auckland Council's (**the Council**) approach to addressing the submission points received on the Proposed Auckland Unitary Plan (**PAUP**) that have been allocated to Topic 080 Rezoning and Precincts (General) (**Topic 080**) and Topic 081 Rezoning and Precincts (Geographical Areas) (**Topic 081**). In particular this evidence provides an overview of Watercare Services Limited's (**Watercare**) water supply and wastewater networks. The Council's approach to zoning land areas where common land uses and activities occur will assist Watercare to plan for the delivery of bulk infrastructure to enable future development of those areas.

PART A – OVERVIEW AND BACKGROUND

2. INTRODUCTION

2.1 My full name is Mark Douglas Bourne. I hold the position of Environment and Consents Manager at Watercare. My qualifications and experience are provided in **Attachment A**.

2.2 I have been asked by the Council in this evidence to set out an overview of Watercare's water supply and wastewater network, which is designed to:

(a) Collect, treat and distribute drinking water; and

(b) Collect, treat and dispose of wastewater.

2.3 This infrastructure is owned and managed by Watercare to provide services directly to the people of Auckland. The focus of this evidence is on Watercare's water supply and wastewater bulk infrastructure.

2.4 I have previously prepared statements of evidence for the PAUP Hearing Topics:

(a) 038 Biosolids; and

(b) 033 and 034 General Coastal Marine Zone and Other Coastal Zones (wastewater network discharges).

3. CODE OF CONDUCT

3.1 I confirm that I have read the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2014 and that I agree to comply with it. I confirm

that I have considered all the material facts that I am aware of that might alter or detract from the opinions that I express, and that this evidence is within my area of expertise, except where I state that I am relying on the evidence of another person.

4. SCOPE

4.1 I am providing evidence to set out an overview of Watercare's water supply and wastewater network infrastructure, which is designed to:

(a) Collect, treat and distribute drinking water; and

(b) Collect, treat and dispose of wastewater.

4.2 This evidence addresses the following matters:

(a) The collection, treatment and distribution of drinking water from Watercare's dams, bores, springs and river sources (which service both metropolitan and non-metropolitan areas);

(b) The collection, treatment, and disposal of wastewater at Watercare's three metropolitan wastewater treatment plants; and

(c) The collection, treatment and disposal of wastewater at Watercare's non-metropolitan wastewater treatment plants. These plants provide wastewater services to Pukekohe and Warkworth (the two satellite towns identified in the PAUP), and rural and coastal villages.

4.3 I have relied on the statements of evidence of John Duguid for Topics 080 and 081 which set out a strategic overview of the Council's approach to zoning and precincts within the PAUP. This evidence should be read in conjunction with the following briefs of evidence:

(a) Raveen Jaduram's evidence for Watercare on behalf of the Council in Topic 012 RPS Significant Infrastructure, Energy and Transport;

(b) David Blow's evidence for Topic 013 RPS Urban Growth;

(c) Mr Blow's evidence for Topics 059-063 regarding Residential Zones; and

(d) The joint statement of evidence from Mr Blow, Christopher Allen and Andre Stuart on Topic 016 RUB North/West and Topic 017 RUB South.

5. BACKGROUND

5.1 This evidence provides an overview of how Watercare's network assets function within an integrated network. Watercare's maintenance programmes and infrastructure projects are prioritised to deliver expected levels of service while managing the risk of asset failure.

5.2 Watercare's water supply and wastewater network infrastructure is managed to ensure that customers are provided with agreed levels of service at a minimum price consistent with its statutory obligations[1]. As set out in Mr Blow's evidence for Topics 016 and 017 (RUB North/West and RUB South), Watercare is also required to give effect to the relevant aspects of the Long Term Plan, and, in accordance with section 58 of the Local Government (Auckland Council) Act 2009, to "act consistently" with the relevant aspects of any other plan or strategy of the Council[2].

5.3 This evidence forms part of the Council's approach to addressing the submission points received on the PAUP that have been allocated to Topic 080 and to Topic 081. In particular this evidence is intended to complement the Council's zoning approach to land use. Zoning areas where common land uses and activities occur will assist Watercare to plan for the delivery of bulk infrastructure to enable the future development of those areas. I do not comment on precinct matters in this evidence as they will be dealt with on a site specific basis by Council's other witnesses in Topics 080 and 081.

5.4 Watercare has provided technical information and evidence to inform the Council's evidence on Topics 080 and 081 and other topics in the PAUP. Watercare's input includes participating in workshops with the Council's planners to advise on the known capacity constraints within Watercare's networks. This information has been provided to enable the Council's planners to make informed assessments and proposals to upzone urban areas within Watercare's current Area of Service. Where possible, Watercare has sought to support and enable the Council planners' proposals, including assurance of the networks' current resilience or their likely resilience in the future if infrastructure can be planned and provided to facilitate upzoning expectations. In general, this has focused on areas where the built infrastructure is in place or is planned to accommodate growth.

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[1] Watercare is required to manage its operations efficiently with a view to keeping the overall costs of water supply and
[2] Watercare is required to give effect to the relevant aspects of Auckland Council's Long Term Plan, and act consistent with the relevant aspects of any other plan or strategy of Auckland Council to the extent specified in writing with the Governing Body. This requirement is set out in section 58 of the Local Government (Auckland Council) Act 2009.

5.5 Generally there is sufficient capacity in the metropolitan bulk water supply and wastewater networks to accommodate the proposed growth, although there are capacity constraints throughout the local network. These can be resolved, subject to funding and timing, to enable growth. There are more capacity limitations in the non-metropolitan areas due to limitation in resource availability (e.g. water sources) or assimilative capacity (e.g. for wastewater discharges).

5.6 A significant challenge for Watercare is how to plan and provide for infrastructure (including both new and augmented infrastructure) for the Auckland region given uncertainty around the timing, quantum and location of growth. Watercare must also ensure its infrastructure is operating in compliance with consent conditions.

5.7 Watercare's overall asset management objective is to operate, maintain, replace and develop assets over the long term to meet required delivery standards and foreseeable future needs at minimum cost. Watercare is committed to best-practice asset management as set out in its Asset Management Plan (**AMP**) and Customer Contract. This means:

(a) **Meeting the needs of a growing region—**As a major regional infrastructure provider, Watercare works with the Council to ensure the region is equipped to meet the needs of a growing population, while also maintaining the quality of our harbours and coastline. Watercare is focused on using Aucklanders' investment wisely and well. Watercare plans capital works projects which future proof for growth and development in the Auckland region and which replace aging infrastructure and ensure security of water supply.

(b) **Realising the efficiencies of integration—**By law, Watercare is required to manage its operations efficiently and minimise costs to customers (collectively).

(c) **Minimising the impact of the company's operations—**Watercare is also committed to being a good corporate citizen by ensuring the water and wastewater services we deliver balance the social, cultural, economic, and environmental needs of the people we serve.

5.8 As discussed in Mr Blow's evidence for Watercare in Topics 059-063 (on the Residential zones) development within Watercare's Area of Service puts pressure on Watercare's network as it has not historically been designed to accommodate the level of development that would be possible if the proposed rezonings are accepted.

While development may be enabled by the upzoning permitted under the PAUP, it is generally driven by market demand. Watercare will confront the same infrastructure challenge in relation to areas within its Area of Service that are subject to further upzoning.

5.9 The key challenges for Watercare are to:

(a) Analyse and understand the changing trends in market demand and investment enabled by upzoning, as well as changes to market demand; and

(b) Build into the planning model, the capacity to change the timing and quantum of investment over time.

5.10 The majority of areas in the Auckland region have capacity for further water supply and wastewater connections. However, where certain locations have reached or are nearing capacity, temporary restrictions that limit new wastewater connections may be required as a last resort until Watercare can expand its network in those areas.

6. RELEVANT PLANNING AND POLICY DOCUMENTS

6.1 The legislative and strategic framework for Watercare in the Auckland region has already been covered in a number of evidence statements, most completely in the joint evidence of Messrs Blow, Allen and Stuart for Topics 016 and 017.

6.2 Watercare is required to give effect to the relevant aspects of the Long Term Plan, and, in accordance with section 58 of the Local Government (Auckland Council) Act 2009, to "act consistently" with the relevant aspects of any other plan or strategy of the Council.

6.3 Key strategic documents that set out the direction for growth include the Auckland Plan, Local Area Plans, and the Regional Policy Statement provisions within the PAUP. Direction is also included in non-statutory strategies and programmes such as the Infrastructure Strategy and the Future Urban Land Supply Strategy (FULSS) which provide clarity as to the timing, sequence, scale and location of infrastructure requirements over the life of these strategic documents.

Auckland Plan

6.4 The Auckland Plan identifies multiple strategic directions. Of these strategic directions, several set out targets applicable to Watercare:

(a) ***Strategic Direction 7: Acknowledge that nature and people are inseparable***

- Target: Reduce gross per capita water consumption from 2004 levels by 15 per cent by 2025.

(b) ***Strategic Direction 12: Plan, deliver and maintain quality infrastructure to make Auckland liveable and resilient***

- Target: Reduce maximum annual potable water network losses to less than 12 per cent of total network volume by 2040.

- Target: Reduce wet weather overflows to an average of no more than two events per discharge location per annum, where the stormwater and wastewater systems are separated, by 2040 (with priority given to bathing beaches and other sensitive receiving environments by 2030).

6.5 Although not set out in the Auckland Plan, Watercare considers that its work with the Council through the Housing Project Office (HPO) is fundamental to enabling affordable, healthy and secure housing (Strategic Direction 11). By way of example, Watercare has assessed the available spare capacity within the existing water and wastewater networks and has identified that it has capacity to accommodate the 106 Special Housing Areas (**SHAs**) approved by the Council to date.

Regional Policy Statement, Proposed Auckland Unitary Plan

6.6 The PAUP Regional Policy Statement (**RPS**) as proposed to be amended by the Council, contains a number of key sections that are relevant to Topics 080 and 081 that need to be considered and given effect to. These include:

> **2.1 Providing for growth in a quality compact urban form**
>
> *…*
>
> ***Objectives***
>
> *1. A quality compact urban form with a clear defensible limit (Rural Urban Boundary) to the urban expansion of the metropolitan area, satellite towns, rural and coastal towns and serviced villages.*
>
> *2. Urban growth is contained within the RUB primarily focussed within the metropolitan area 2010.*
>
> *…*

Policies

1. Concentrate urban activities within the metropolitan area 2010, the RUB, the satellite towns, rural and coastal towns and serviced villages, avoiding urbanisation outside these areas.

1A. Avoid new towns and villages outside the RUB to support the efficient provision of infrastructure and protection of rural and coastal environments.

…

2.3 Development capacity and supply of land for urban development

…

Objectives

…

4. The development of land zoned future urban within the RUB occurs in ~~a~~an staged~~orderly~~, timely and ~~planned~~integrated manner aligned with the provision of infrastructure.

…

Policies

4. Stage the structure planning and rezoning of future urban zoned land having regard to the Council's Future Urban Land Supply Strategy and to enable coordinated and efficient ~~the~~ provision of infrastructure within the RUB, in accordance with the following principles:

- *a. land should be rezoned following the ~~approval~~ preparation of a structure plan ~~prepared~~ by either the council, the private sector, or public private sector partnership in accordance with Appendix 1.1*
- *b. rezoning ~~and infrastructure provision~~ should ~~be done~~ occur in a logical and integrated sequence, and aligned with the provision of infrastructure that is planned and has identified funding (including significant infrastructure) ~~out of sequence should be specifically avoided~~*
- *c. new urban growth within the RUB should be immediately adjacent to existing urban land unless the separation is necessary to:*
  - *i. avoid, remedy or mitigate significant conflict between activities*
  - *ii. ensure the efficient provision of infrastructure, including transport*
  - *iii. take account of the topography or other physical constraints*
  - *iv. avoid the areas outlined in Policy 3 above*

d. there is sufficient development capacity and land supply for both business and ~~housing~~residential growth in each sector i.e. north, ~~central,~~ west and south

e. the location and quantity of ~~land~~development capacity being released at any one time will have regard to the scale and economies of servicing and developing the land

f. ~~the~~achieves a quality compact urban form and a range of housing choices ~~desired~~ for the area ~~are met~~

g. the ability to ~~supply~~enable housing that is more affordable to households on low to moderate incomes

5. Require comprehensive planned development of greenfield land zoned for business and residential uses, through a structure plan process to ensure development is aligned with the provision of significant infrastructure, stormwater management and achieves a well planned quality community.

…

2.5 Existing ~~R~~rural and coastal towns and villages

…

Objectives

…

3. Growth in towns and serviced villages is contained within the RUB or where the RUB has not been established, within the urban areas~~zones~~ existing at the date the Unitary Plan becomes operative.

…

Policies

1. Require proposals ~~for~~to expand~~ing~~ existing rural and coastal towns and serviced villages that do not yet have a RUB, and have safe and efficient transport connections and efficient and well performing wastewater ~~facilities~~networks with additional or planned and funded capacity to be developed in a manner that:

[…]

c. incorporates affordable, feasible, sequenced and funded ~~social and physical~~ infrastructure, including significant infrastructure.

6.7 These objectives and policies reflect the alignment between the Council's strategic approach to planning and Watercare's capital programme. As discussed in Mr Blow's Topic 013 RPS Urban Growth evidence, Watercare develops its capital programme to support the key principles of the Auckland Plan. The RUB defines the limit of Watercare's investment in infrastructure. Watercare works to plan for and provide infrastructure to maintain services and renew services in existing areas, and

facilitate the Council's growth expectations for the Auckland region both in existing areas and in greenfield areas in accordance with the policy framework in the PAUP. The location, size and timing of any new development have a direct bearing on the infrastructure required to service that development. If infrastructure is not in place, then development cannot proceed. Watercare continually engages with the Council around where growth will occur, as well as the sequence and timing of growth.

PART B – WATER SUPPLY

7. BACKGROUND

7.1 Watercare operates one metropolitan scheme servicing a population of around 1.32 million people, and eight non-metropolitan schemes servicing around 23,000 people in rural and coastal settlements in Franklin and Rodney.

7.2 Water from the metropolitan scheme is sourced from nine dams (five in the Waitakere Ranges and four in the Hunua Ranges), the Waikato River and an aquifer in Onehunga, and is treated at five treatment plants. Water sources for the metropolitan and non-metropolitan schemes are set out in **Attachment B**. The high cost of developing new township schemes means that very few new schemes have been developed in recent years. Watercare has extended the metropolitan supply network to Kumeu, Huapai and Riverhead, in the north of the region, while in the south, the Waikato-treated water supply network has been extended to include Pukekohe, Patumahoe, Clarks Beach and Waiau Pa.

7.3 A significant proportion of water for Auckland does not come from Auckland. The Auckland region has outgrown its ability to source water sustainably and now takes water from beyond its boundaries.

7.4 Watercare operates an integrated water supply network. This means that the system is designed to operate by bringing all stored water sources down at the same rate, and using run of river sources such as the Waikato River and the Onehunga aquifer as levels reduce. This will generally reduce the overall cost of running the system and generally prevent the southern lakes from overflowing. The (urban) water supply network is robust and is designed to supply water with a drought security standard of 1 in 100 years with 15 percent water storage (i.e. the dams are 15 percent full).

7.5 Watercare undertakes long-term planning to ensure additional sources to meet additional population growth and treatment plant capacity are available to meet peak

demand periods. There is a difference between yield and treatment capacity. The yield is the amount of water that can be drawn from a source at a given inflow constraint whereas the sustainable water treatment plant capacity is the maximum capacity the plant can operate at reliably, taking into account process limitation.

7.6 The Waikato Water Treatment Plant is consented at 150,000m3/day (treatment plant capacity). To meet urban Auckland's future needs, Watercare will need to source additional water by the early 2020s. Watercare has undertaken an options analysis and identified the Waikato River as the preferred source and lodged a resource consent application for additional water.

How Watercare's water supply network functions

7.7 In a water supply schemes raw water is supplied from storage dams or pumped from bores or river sources via pipes to the water treatment plant for treatment, and then transmitted to the end user through a series of large transmission pipes that then feed potable water into the local distribution network.

7.8 Treatment plants vary in size and treatment processes, providing treatment appropriate to the quality of the raw water and the networks each plant supplies. After treatment, water is gravity fed or pumped to reservoirs located at high elevations. The reservoirs provide additional supply into the network during peak demand times and in emergency situations. They also provide "head" or pressure for the water to flow to lower elevations in the network by gravity. Most of the pipe network functions by gravity with pumping only required to push water to the few properties at higher elevations.

7.9 Watercare's metropolitan water supply is divided into zones to maintain pressure across Auckland's variable topography. In selected locations pressure reducing valves (**PRVs**) are installed to reduce pressures to lower areas of the zones.

7.10 Hydrants are installed on all the local reticulation networks for fire-fighting and operational purposes such as flushing and draining pipes. The networks are regularly tested by Watercare and the New Zealand Fire Service to ensure sufficient water pressure and flow is available from the hydrants to fight fires.

7.11 Water meters are installed at each property to monitor the volume of water each customer uses. Water is charged for by volume. Meters are not usually installed on fire hydrants. Bulk meters record the volumes moving from the bulk supply network into the metropolitan scheme zones.

Water supply transmission network planning

7.12 There are two key foci for water supply network planning:

(a) New assets to create increased capacity to service growth, and

(b) Asset renewal for aging pipes.

7.13 The key new project is Hunua 4, a new 28km pipe from the Redoubt Road reservoir to the Kyber Pass Reservoir in the Central Business District. The purpose of the Hunua 4 watermain project is to increase the security of water supply from southern water sources and provide for growth. This is a $376 million project. Construction started in 2012 and is due to be completed in 2020.

7.14 Another major project that is underway is the construction of the new Runciman Reservoir. Initially one new water reservoir will be constructed, with the potential for a second one later on. The construction of the first is scheduled for 2017 and the second in approximately 10-15 years.

7.15 Watercare has also lodged a resource consent application for a new water take from the Waikato River to cater for the next decades of growth in Auckland.

7.16 Watercare also has the 2013-2016 Auckland Regional Water Demand Management Plan. This strategy identifies a range of programs to reduce the per capita water demand in Auckland.

Waikato Water Treatment Plant

7.17 The Waikato Water Treatment Plant was upgraded in 2012 to a capacity of 125,000m3/day to meet projected demand until 2019, subject to demand management targets being achieved. In 2013/14, a project commenced to upgrade the Plant's capacity by a further 25,000m3/day to a total capacity of 150,000m3/day. This upgrade of the water treatment plant to a capacity of 175,000m3/day has been brought forward from 2020/21 as a response to the increasing likelihood and the duration of drought events and is now expected to be completed by 2016/2017. Two subsequent capacity upgrades are planned for 2027 (additional 50,000m3/day) and 2035 (additional 100,000m3/day), to meet growing demand for drinking water.

7.18 Watercare is currently investigating options for a second water supply transmission network in the southern area (Waikato No. 2 Watermain). This investigation includes potential future routes for an additional pipeline to the existing Waikato No. 1

Watermain, connecting the Waikato Water Treatment Plant to Auckland. However, other options for extending the capacity of the Waikato No 1 Watermain are also being carefully considered.

Western Water Supply Strategy

7.19 The current demand to the West and North of Auckland is approximately 80,000m3/day. Demand is serviced primarily from the North Harbour No. 1 Watermain, which is supplied from the Huia Water Treatment Plant via the Huia No. 2 Watermain. In periods of high demand or when the Huia Water Treatment Plant is out of service, the New Lynn Pump Station (which operates daily and supplies water to customers in West Auckland) transfers water from Hunua No. 3 to the North Harbour No. 1 Watermain. The demand is supplemented from the Waitakere No. 1 and No. 2 watermains, which are supplied from the Waitakere Water Treatment Plant.

7.20 The Huia Water Treatment Plant is supplied from the two Huia dams and the two Nihotupu dams in the Waitakere Ranges. Raw water is delivered through a network of pressurised watermains and open surface tunnels. The two lower dams have pump stations to lift water into the tunnels, while the two upper dams gravity feed water to the head of the Huia Water Treatment Plant.

7.21 The Waitakere Water Treatment Plant has a peak capacity of 20,000m3/day. The plant is supplied solely from the Waitakere dam, via a dedicated pressurised watermain. It services the higher elevation areas of West Auckland. Both the Pleasant Road and Hobsonville Pump Stations provide supply when the Waitakere Water Treatment Plant is out of service.

7.22 Growth estimates are based on the Council's population growth projections. There is some uncertainty because of the SHAs, of which a number are located in the North-West greenfield areas. However, the transmission watermains are designed using the peak flow of the peak day estimations with long-term design horizons. The pipes are designed with a 100-year design life, which typically means that the pipes are oversized for the first half of the design life and potentially undersized for the second half of the design life.

7.23 The North Harbour No. 2 Watermain will service the growth horizon for the north west and will be supplied directly from the Huia Water Treatment Plant. This will allow a gravity supply of treated water to Albany reservoirs on the North Shore. Hunua No. 4

Watermain will feed Auckland's Central Business District and will allow the Hunua No. 3 to supply more water to the West and the North via the North Harbour No. 1 and the New Lynn Pump Station.

Helensville

7.24 Watercare is working to identify a range of non-coastal aquifers in the Auckland region, including an investigation of groundwater sources to supply the Helensville area. The current Average Daily Demand (ADD) in Helensville is approximately 1,063m3/day. The Peak Daily Demand (PDD) is approximately 1,600m3/day. Population predictions suggest a doubling of the residential population in Helensville during the next 40 years with a correlating increase in water demand.

7.25 It has been identified that the Mangakura Dams and the Sandhills Wetland, which supply Helensville, do not have a sufficient yield to meet future growth. The Awaroa Bore in the Awaroa Stream floodplain yields an insufficient volume of water to mitigate present or future supply-demand challenges.

7.26 Watercare is continuing to investigate new sources of raw groundwater because the water quality and quantity is likely to be more reliable than a surface water source.

7.27 Watercare advised the Council that it can service approximately 60 dwellings in the approved SHA (which is outside the existing urban area) from existing sources. However, if the additional plant capacity is taken up by the SHA, this will limit further development in the area.

Warkworth

7.28 Warkworth has historically relied on water taken from the Mahurangi River. The Mahurangi River is a tidal estuary that opens into the Mahurangi Harbour and then out to Hauraki Gulf.

7.29 As the Mahurangi River source is not able to provide for the growth of Warkworth, Watercare has developed a new groundwater source at Sanderson Road. The bore is now constructed and water quality testing is on-going. Once the water quality is proven, Watercare will either build a new water treatment plant at this new location and gradually bring the groundwater from this bore into production or upgrade the existing treatment plant. The delivery timeline for this is expected to be about two years.

7.30 Once the new source is brought into production, Watercare will transition from the river source to the groundwater source.

7.31 The new water groundwater source at Sanderson Road is planned to cater for a population of approximately 12,000-15,000 people. Beyond that, new sources will need to be identified. Watercare is investigating various alternatives. This includesconnecting the water supply network with the Hamilton Road bore in Snells-Algies, although this is likely to only be used as a measure to increase the resilience in the system rather than cater for growth.

Wellsford

7.32 As discussed in paragraph 19.9 of Mr Blow's Topic 016 and 017 evidence, water is supplied to the Te Hana and Wellsford communities by a water take from the Hoteo River. The daily take limit is 1,300m3/day. This is equivalent to approximately 1,700 dwellings on average. There are approximately 1,000 equivalent dwellings currently connected to the water network.

7.33 There is also a consented annual water take volume limit of 270,000m3 per year. The 2015 monitoring report indicated that the cumulative take exceeded the annual limit, based on the current connected dwellings. Watercare is currently seeking a replacement consent that uses a "net take" approach, which will increase the take from 1300m3/day to 1500m3/day and have no annual limit. This will provide for additional supply capacity.

PART C – WASTEWATER

8. BACKGROUND

8.1 A wastewater network comprises pipes that originate from connections to individual houses and commercial or industrial buildings, and join to larger pipes that service neighbourhoods (collectively referred to as the local network). These pipes then connect to larger transmission pipes that convey the wastewater to a treatment facility (collectively referred to as the transmission network).

8.2 In 1960, the Mangere Wastewater Treatment Plant was commissioned along with construction of several of the trunk interceptor sewers to convey all of Auckland's wastewater (south of the Auckland Harbour Bridge) to Mangere. The Mangere Wastewater Treatment Plant was most recently upgraded in 2003 when the oxidation ponds were removed and significant foreshore restoration was undertaken.

8.3 In 1962, the Rosedale Wastewater Treatment Plant in Albany was commissioned to accommodate the rapid development of the North Shore. In 1982 the Army Bay Wastewater Treatment Plant on the Whangaparoa Peninsula was commissioned to treat the Hibiscus Coast's wastewater. The Mangere, Rosedale and Army Bay plants were transferred to Watercare following local government amalgamation in 2010 and comprise the three metropolitan wastewater treatment plants that service over 1.35 million people.

8.4 There are also 15 non-metropolitan wastewater treatment plants of various sizes that service the two satellite towns (Pukekohe and Warkworth) as well as rural and coastal settlements. The non-metropolitan wastewater plants were mostly constructed in the 1970s and 1980s. The most recent scheme to be commissioned was in Kawakawa Bay in 2011.

8.5 Watercare's metropolitan and non-metropolitan wastewater networks servicing Auckland comprise three components being the local network, the transmission network, and the treatment plants. These are described below:

(a) Local network—the local network is a network of smaller local wastewater pipes that collect wastewater from individual properties and convey wastewater to the transmission network;

(b) Transmission network—the transmission network is comprised of the large transmission interceptors and branch sewers that convey the wastewater to the region's wastewater treatment plants; and

(c) Treatment plants—the treatment plants treat the wastewater to a level where it can be safety discharged into the receiving environment. The receiving environment can be coastal waters, freshwater, or land.

8.6 A list of the wastewater treatment plants for the metropolitan and non-metropolitan schemes is set out in **Attachment C**.

8.7 Collectively, Watercare's wastewater network comprises approximately 7,700km of wastewater pipes and 488 pump stations.

8.8 This evidence discusses the regional wastewater servicing strategy, focusing on the capacity (current and planned) of the transmission network to service urban growth in Auckland. The evidence will provide an overview of Watercare's wastewater servicing in two parts:

(a) Metropolitan plants that service the metropolitan area of Auckland (via Mangere and Rosedale), and the Hibiscus Coast (via Army Bay); and

(b) Non-metropolitan plants that service Pukekohe, Warkworth and a number of rural and coastal settlements.

8.9 The Comprehensive Discharge Consent (commonly known as the Network Discharge Consent (**NDC**)) requires that Watercare manage the wastewater network (including both the combined and separated network) to achieve either: (a) an average of no more than two Wet Weather Overflow Events per Engineered Overflow Point per year; or (b) an alternative discharge frequency that can be shown to be the Best Practicable Option (BPO) if this cannot be achieved for one or more Engineered Overflow Points. Watercare is required to develop a Wastewater Network Strategy on a six-yearly basis. The Strategy will including a prioritised Wastewater Network Improvement Works Programme that will outline:

(a) How the existing Levels of Service that already meet the NDC performance target will be are maintained;

(b) How Levels of Service will be improved where necessary and practicable; and

(c) How urban growth with be provided for.

8.10 The Wastewater Network Improvement Works Programme (both capital and operational solutions) developed under the NDC framework will form the basis of the wastewater networks component of Watercare's AMP, in alignment with programmed renewals and the wastewater treatment servicing strategy.

9. METROPOLITAN AUCKLAND

9.1 The majority of the metropolitan area of Auckland is serviced by two wastewater treatment plants: the Mangere Wastewater Treatment Plant and the Rosedale Wastewater Treatment Plant.

Central Isthmus

9.2 The initial development of Auckland was focused in central Auckland. In the 1880s, stream pollution and a typhoid outbreak prompted a need for a public, reticulated wastewater disposal system to replace the cesspits and nightsoil collection system. Between 1900 and 1920 a combined (wastewater and stormwater) system was built in central Auckland, discharging directly into the Waitemata Harbour near Okahu Bay

without any treatment. Other boroughs such as Hillsborough also built underground pipe networks to collect wastewater and stormwater with discharge to the Manukau Harbour (also without treatment).

9.3 The Mangere Wastewater Treatment Plant was commissioned in 1960. Together with the Mangere Plant, several large wastewater interceptors were constructed to convey the wastewater to the new plant. Today the Central Isthmus is serviced by a system of key wastewater interceptors:

(a) **Orakei Main Sewer**–This wastewater pipe was constructed between 1908 and 1914 and extends from Waterview area to Okahu Bay. It serves the suburbs of Mount Albert, Three Kings, Point Chevalier, Sandringham, Westmere, Grey Lynn, Ponsonby, the Central Business District, Newmarket, Remuera, Ellerslie, and Meadowbank. Large parts of these catchments are serviced by the combined sewer network. In 2009, a 3km section of the downstream end of the Orakei Main Sewer was replaced by a tunnel (Project Hobson) that provides for increased capacity for wastewater storage and some overflow mitigation.

(b) **Eastern Interceptor**—This interceptor was constructed in 1960 (at the same time as the Mangere Wastewater Treatment Plant). It starts at the Okahu Bay Pump Station and connects directly to Mangere. In addition to the flows from the Orakei Main Sewer, it picks up flows from the Eastern Bays, Howick and Tamaki.

(c) **Western Interceptor**—Auckland's western catchments flow to the Western Pump Station in Te Atatu. From there the Western Interceptor, also constructed in 1960, takes those flows and conveys them to the Mangere Wastewater Treatment Plant. Along the way, it picks up flows from the Onehunga Branch Sewer which services the largely industrial catchment to the west of Mount Wellington.

(d) **Southern Interceptor**—This interceptor was constructed in 1965, connecting the majority of south Auckland to the Mangere treatment plant. The suburbs of Manukau, Homai, The Gardens, Manurewa, Weymouth, Takanini, Wattle Downs, Papakura and Drury are serviced in part or in whole by this interceptor.

9.4 At a macro level, there are two key servicing constraints facing the Central Isthmus:

(a) Significant capacity constraints in the combined sewer network; and

(b) A future limitation on the Mangere Wastewater Treatment Plant.

9.5 Around one fifth of the Central Isthmus area continues to be serviced by a combined network. Both wastewater and stormwater is directed to a single pipe network. This combined system is designed to convey dry weather flows (i.e. wastewater) to the treatment plant. In wet weather increased flow is conveyed to the treatment plant, but during periods of heavy rainfall it is designed to overflow stormwater mixed with wastewater at specific locations. Over the last two decades, work has been undertaken to decouple the stormwater and wastewater by installing separate pipes. This work has proved challenging due to the scale of the infrastructure challenge and the significant capital cost and the fact that even in 'separated' areas, there is still a significant amount of stormwater discharged into the wastewater network.

9.6 To address this infrastructure challenge, Watercare has proposed the construction of the Central Interceptor. This area covers the western part of the Auckland Isthmus wastewater network (an area of approximately 43km2). This $880 million project consists of a new 13km gravity tunnel from Western Springs to the Mangere Wastewater Treatment Plant, three link sewer tunnels extending westward from the main tunnel, a series of connections with the existing wastewater network, and a new pump station. The project also includes a series of 'CSO Collection Sewers' which are smaller wastewater pipes that extend out from the main work into local catchments to provide overflow mitigation in each catchment area.

9.7 The purpose of this project is to:

(a) Provide network capacity for growth and development in the central area;

(b) Duplicate the lower section of the Western Interceptor; and

(c) Reduce existing wastewater overflows from the old combined network into urban streams and the Waitamata Harbour.

9.8 The Central Interceptor is, in part, being developedto support growth throughout the Central Area both in the western part of the isthmus (which will be serviced directly by the Central Interceptor) and in the eastern part because it will free up capacity in the Eastern Interceptor by diverting the wastewater from the Orakei Sewer. The estimated completion date for the Central Interceptor main works is 2027.

9.9 Another key project that Watercare has underway to relieve the pressure on the Mangere Wastewater Treatment Plant is the construction of the Northern Interceptor. Its purpose is to transfer flows from the Hobsonville Pump Station to the Rosedale Wastewater Treatment Plant instead of the Mangere Wastewater Treatment Plant. Portions of the west Auckland wastewater catchments will be diverted to the Hobsonville Pump Station. This will free up capacity at the Mangere Wastewater Treatment Plant to service the Central and Southern Areas of Auckland.

North Shore

9.10 The wastewater network in the former North Shore City Council area was built as an integrated system that consists of a number of transmission pipes that convey wastewater to the Rosedale Wastewater Treatment Plant. The North Shore system is characterised by a significant number of pump stations (both in the transmission and local networks) that convey wastewater to rising mains.

9.11 The former North Shore City Council (**NSCC**) launched a programme in 2002 focused on reducing the number of wet weather overflow events in the North Shore network from over 12 times per annum to no more than two per annum by 2021. As part of this programme the NSCC undertook investigative work to update the network model, identify the vulnerable areas of the network, identify the priority catchments for improvements, and develop a programme of upgrade works. A number of the identified projects have been carried forward into Watercare's programme of works. Future improvements identified will be prioritised within the programme in accordance with the NDC conditions.

West and North West Auckland

9.12 Auckland's western catchments gravitate via the Swanson, Whenuapai and Glen Eden Branch Sewers to the Western Pump Station in Te Atatu. From there the flow is pumped into the Western Interceptor and conveyed to the Mangere Wastewater Treatment Plant.

9.13 The North West sub-region of Auckland (the North West Transformation Area) has been identified as a significant area for future urban development within the Rural Urban Boundary (**RUB**). This area consists of Whenuapai, Redhills, Hobsonville, Massey and further out into Kumeu, Riverhead, and Huapai.

9.14 The new growth areas of Redhills, Massey, and Whenuapai are serviced by the Massey North Branch Sewer that conveys flow to the Hobsonville Pump Station.

Wastewater from Hobsonville also flows to the Hobsonville Pump Station. These flows are currently conveyed to Mangere Wastewater Treatment Plant via the Western Interceptor. However, in the future, Watercare will divert flows to the Rosedale Wastewater Treatment Plant once the Northern Interceptor is constructed.

9.15 A number of the key pump stations along this network will need to be upgraded to accommodate future growth as they were designed and constructed to meet the projected level of development in this area envisioned by the former Waitakere City Council. The Hobsonville Pump Station was specifically designed to be duplicated in the future, and will have the ability to pump flows to either Mangere or Rosedale, enabling wastewater to be managed as a regionally integrated system.

Kumeu, Huapai, and Riverhead

9.16 In 2010, Watercare took over a project initiated by the former Rodney District Council to install a wastewater network to serve urban growth in the communities of Kumeu, Huapai and Riverhead, and to address pollution problems associated with failing septic tanks. Watercare completed the installation of this wastewater network in June 2012. This system is a Pressure Wastewater Collection (**PWC**) system that conveys wastewater to the Riverhead Pump Station then onwards to the Hobsonville Pump Station. The uptake of connections to the wastewater network in this area has been much slower than that projected by the former Rodney District Council, causing significant operational challenges for the network in the first years of its operation. While the situation is improving slowly, this is an example of a significant investment in wastewater infrastructure beyond the main metropolitan area that continues to be significantly underutilised.

9.17 This network was designed to cater for the full development envisaged under the Rodney District Plan. While this area generally only reflects a limited amount of upzoning, there is a significant amount of future urban land proposed here. This will require the network to be duplicated at some point in time. For example, a new Huapai pump station will be needed and the existing Riverhead Pump Station will likely need to be upgraded to accommodate the growth signalled by Council, but the timing of this will depend on the actual growth in the area.

South

9.18 The Southern metropolitan area (excluding Pukekohe) is serviced by the Southern Interceptor and the South-Western Interceptor. The Southern Interceptor services

Pakapura and Manukau and connects into the Eastern Interceptor at Otahuhu. The South-Western Interceptor was built in the 1980s to provide extra capacity to deal with the growth in South Auckland. The South-Western Interceptor connects directly to the Mangere WWTP. Watercare is proposing to replace or duplicate the Southern Interceptor to enable further growth in South Auckland. This work will have to be undertaken to enable the full extent of development provided for in the future urban zones in Hingaia, Karaka and Drury. Initial investigations into this area are now underway. There are some initial upgrades planned within the next 10 years, including upgrades to the Hingaia Pump Station and rising main. Additional major reinforcements will be required to accommodate the full build out of the southern future urban land, but the scale, scope, and timing of this not yet known.

Hibiscus Coast

9.19 The Army Bay Wastewater Treatment Plant located on the Whangaparoa Peninsula is Watercare's third metropolitan wastewater treatment plant. It currently serves a population of approximately 46,000 people, but this is forecast to increase to an ultimate population of 135,000. The plant was built in 1982 and upgraded in 1998 and 2005. Treated wastewater is discharged into the Hauraki Gulf and all dewatered biosolids are taken to a permitted solid waste landfill for disposal.

9.20 Wet weather flow into the Army Bay Wastewater Treatment Plant currently peaks at around 700 litres/second and is forecast to increase to around 1,400 litres/second. However, the overall plant capacity is currently constrained to 300 litres/second by the capacity of the existing marine outfall. This restricts the ability of the Hibiscus Coast network to pass flow forward to the plant and requires flows above 300 litres/second to be stored in attenuation ponds at the plant or split to the environment from the wastewater network.

9.21 During extreme wet weather events, there is a manual procedure that is followed to throttle the flows within Watercare's network. This results in the overflow of untreated wastewater to the sea from the wastewater network as decant ponds at the Army Bay Wastewater Treatment Plant reach their capacity limits. The Hibiscus Coast is a high growth area and the need to throttle the network due to the limited outfall capacity will become more frequent.

9.22 There is a project underway to upgrade the outfall pipe from the treatment plant. This will increase the capacity of the flows able to be discharged, reducing the need

to throttle flows in the network. This project is currently programmed for completion in 2019.

10. NON-METROPOLITAN AREAS

North

10.1 Watercare operates and manages seven non-metropolitan wastewater treatment plants in the northern area of the Auckland region i.e. at Denehurst, Omaha, Snells-Algies, Helensville, Waiwera, Warkworth and Wellsford.

Snells-Algies and Warkworth

10.2 Warkworth and Snells-Algies are currently serviced by two wastewater treatment plants, one located at Warkworth and the other at Snells Beach.

10.3 The Warkworth Wastewater Treatment Plant is situated alongside, and discharges into, the Mahurangi River. Watercare is currently in the process of obtaining a replacement consent for the discharge of wastewater. The existing consent has an area of service that constrains Watercare's ability to connect any properties outside of this area. While there is capacity at the wastewater treatment plant to service additional growth, there are questions about the long-term sustainability of continuing to discharge treated wastewater in the Mahurangi River. Watercare is considering options for the long-term servicing of Warkworth. One option under consideration is to divert the wastewater flows from Warkworth to the Snells-Algies plant and decommission the Warkworth wastewater treatment plant.

10.4 The existing network generally has the capacity to service the existing urban areas, but the wastewater network will need to be upgraded and extended to service future urban areas as the growth occurs.

10.5 The Snells-Algies Wastewater Treatment Plant services the wider Snells Beach and Algies Bay areas. The plant has a consented discharge of 4,680m3/day and currently services approximately 2,200 dwellings.

10.6 Although the plant currently has capacity to service growth in Snells-Algies, the outfall pipe is in very poor condition and must be replaced. Watercare has a $20 million project underway to replace the 7.6km pipe. To minimise the risk of breakages in the pipe, Watercare has throttled back the wastewater pump station (to equivalent of 23 litres/second). This has limited Watercare's ability to accept new connections in the area until the new outfall pipe is in place. The outfall pipe

replacement project commenced. Once this pipe has been completed, the plant will be able to service approximately 13,000 people.

10.7 The local wastewater reticulation network will need to be upgraded to accommodate additional growth in this area.

Matakana, Point Wells and Omaha

10.8 As discussed in Mr Blow's evidence for Topics 059-063 on Residential zones, Matakana, Point Wells and Omaha are all serviced for wastewater by the Omaha Wastewater Treatment Plant. The treatment plant operates under two resource consents which combined provide for a total discharge of 2060m3/day. However, the current treatment capacity of the plant is approximately 600 - 900 m3/day (equating to 900 – 1500 equivalent dwellings) with the existing number of filters. To achieve the maximum throughput at the plant, additional filters would be required.

10.9 The network between Point Wells and the Omaha wastewater treatment plant as well as Matakana and the Omaha Wastewater Treatment Plant is a pressure wastewater collection network. The Omaha catchment is a gravity collection system with a pump station and rising main to the plant.

10.10 There are approximately 1,500 dwellings already connected across the three communities. There is an approximately 300 dwelling potential within the existing undeveloped land at Matakana. In addition, in excess of 100 lots have been accepted for connection in the Point Wells area. This means that the plant is currently operating at capacity, and when connections are required in the existing undeveloped land, this will put additional pressure on the plant and trigger the need for an upgrade.

10.11 There are also significant seasonal influences, with summer peaks raising the loads and flows to the treatment plant. Buffering storage is utilised to maintain discharge consent compliance, as required.

10.12 Watercare had has allocated $3.0M (2015 dollars) in 2018/19 for additional filters to remove the hydraulic capacity constraint at the plant that currently constrains its capacity. However, even with this upgrade future connections to this plant will need to be managed to ensure compliance with the conditions of the plant's wastewater discharge consent.

Wellsford

10.13 Wellsford and Te Hana are serviced by the Wellsford Wastewater Treatment Plant. Te Hana is connected to Wellsford via a gravity network, a pump station and a rising main to the Kelly's Hill Pump Station in Wellsford. This pump station then connects with a gravity network into the Armitage Pump Station, which, with other gravity networks, feeds into the Wellsford wastewater treatment plant.

10.14 The Wellsford Wastewater Treatment Plant has a consent discharge capacity of 1,260m3/day. This equates to approximately 1,900 equivalent dwellings. There are significant wet weather influences to the flow such that the daily flow limit is exceeded with the current connected dwellings during specific wet weather events. In addition, the treatment capacity of the plant has also been reached for the existing connected dwellings. The consent for this plant has expired, but continues to operate legally in accordance with the provisions of the RMA. A new replacement consent application will be lodged in the second half of 2016.

10.15 Notwithstanding theoretical capacity in the plant itself, there are a range of compliance issues that are being addressed by Watercare as part of the reconsenting process. This limits Watercare's ability to increase the number of connections to the plant at this time.

Helensville

10.16 The Helensville Wastewater Treatment Plant services Helensville and Parakai. This plant has recently been upgraded to enable the plant to comply with the discharge consent granted in 2012. These upgrades enabled Watercare to lift the red zone in Helensville and allow further connections. However, the upgrades were focused on meeting Watercare's compliance requirements rather than on servicing additional growth.

10.17 In addition to controlling the capacity of the plant, Watercare is also working to manage connections at Parakai. The Springs Road Pump Station at Parakai is designed to accommodate 70 litres/second. As discussed in Mr Blow's Topic 016 / 017 evidence, Watercare has not undertaken an investigation of the cost and feasibility of upgrading that pump station for this evidence but notes that any upgrade would also trigger works with the associated conveyance network (which runs under the Kaipara River).

Waiwera

10.18 The Waiwera Wastewater Treatment Plant was commissioned in 1974. The plant receives wastewater from the township of Waiwera, and is located on the southern side of the estuary. The plant consists of two oxidation ponds constructed by infilling and forming embankments within the Waiwera Estuary.

10.19 The existing resource consent for the Waiwera Wastewater discharge expired on 31 December 2000. It permits the discharge of treated wastewater effluent from the Waiwera Wastewater Treatment Plant to the Waiwera Estuary channel. Watercare has considered options to progress the consent application, and prefers the option of piping wastewater from Waiwera to Hatfields Beach. However, because the existing network around Hatfields Beach and Orewa is already constrained, portions of the plant at Waiwera would be retained for pre-treatment and storage during wet weather.

South

Beachlands / Maraetai

10.20 The Beachlands Wastewater Treatment Plant has an existing consent condition that limits the population that can be serviced by the plant to 10,000 people. There is also a volume limit on discharge of 2,800m3/day. The discharge consent for the plant expires in 2025.

10.21 The plant's treatment capacity is 10,000 people. There are currently approximately 7,000 people connected to the plant.

10.22 As discussed in Mr Blow's evidence for Topics 059-063, if growth occurs to the levels currently indicated by the Council in the Residential Settlement Serviced[3] (RSS) and Plan Change 30, the 10,000 people limit will be reached before 2025, requiring Watercare to seek new discharge consent earlier than currently expected.

10.23 Significant infrastructure provision and upgrade will also be required to support this level of intensification.

Clevedon

10.24 Plan Change 32 provided for the expansion of Clevedon Village on the rural land outside the existing village. This plan change was initiated by the former Manukau City Council and carried forward by the Council following amalgamation. It was notified in October 2010 and became fully operative in April 2015.

[3] Residential Settlement Serviced is a consent standard applicable to the Manukau provisions of the operative plan.

10.25 A key driver for the plan change was to develop a township of sufficient size to enable the development of a wastewater network to address the public health and environmental concerns associated with failing septic tanks. Watercare has undertaken a comprehensive options assessment to identify the preferred servicing option. These included various options around building a new local treatment plant to options for connecting into the existing network. The preferred option is to construct a new pipe to convey wastewater from Clevedon to the existing Watercare network in Takanini for further conveyance to the Mangere Wastewater Treatment Plant. The technical and financial evaluation of the options has been based the projected level of development identified in Plan Change 32.

10.26 Watercare does not have provision for funding this new infrastructure in its AMP.

10.27 The Clevedon landowners have formed an infrastructure development company and Watercare is currently in discussions with the group about financial and operation arrangements regarding the construction and operation of the new infrastructure.

Pukekohe

10.28 Pukekohe is serviced by a local network that connects to the Pukekohe Trunk Sewer that conveys wastewater to the Pukekohe Wastewater Treatment Plant. Both the location of the plant and the discharge environment is outside of the Council's area. The plant continues to service the Auckland communities of Pukekohe, Paerata and Patumahoe, as well as the Waikato District communities of Tuakau and Pokeno.

10.29 A significant issue in the Pukekohe area is that there is limited capacity in the existing local wastewater network through Pukekohe, and the capacity varies from location to location. The local wastewater network will require significant upgrading to accommodate the Future Urban zone land adjacent to Pukekohe.

10.30 The existing trunk wastewater pipe between Pukekohe is currently being upgraded and is being sized to cater for growth in the wider Pukekohe area, including neighbouring growth areas in the Waikato District (Tuakau and Pokeno). The estimated completion date is 2017.

10.31 The Pukekohe Wastewater Treatment Plant currently has consent capacity to allow a daily discharge of 8,450m3/day, which equates to approximately 13,000 dwellings on average. The treatment capacity matches this figure. Watercare is currently seeking a short-term replacement discharge consent from the Waikato Regional Council, and developing a longer-term servicing strategy that will require a significant upgrade of

the Pukekohe Wastewater Treatment Plant. The future capacity of this plant will be limited by the level of discharge allowed by the future discharge consent. This plant discharges into the Waikato River and therefore is influenced by the wider vision and strategy for the Waikato River and the existing co-management regimes that are now in place of the River.

West Franklin

10.32 The West Franklin area is currently serviced by three small wastewater treatment plants located at Clarks Beach, Waiuku and Kingseat:

(a) ***Clarks Beach/Glenbrook/Waiau***—The wastewater treatment plant at Clarks Beach has a consented discharge volume of 600m3/day which equates to approximately 2,700 people (or 900 dwellings). Currently this plant services Clarks Beach, Glenbrook Beach and Waiau Beach. There are currently approximately 550 dwellings connected to the plant. However, because the plant is significantly affected by wet weather, it cannot accept many new connections at the present time until the plant is upgraded or a new consent is obtained allowing for increased discharges.

(b) ***Kingseat***—There is currently a small public wastewater treatment plant located at Buchanan Road. This plant provides wastewater services to 30 dwellings. It does not have capacity to service any additional dwellings.

(c) ***Waiuku***—There is currently a public wastewater treatment plant located in Waiuku. The current discharge consent was recently renewed for a further five years (until 2019), but is subject to extensive monitoring conditions because the plant discharges into the Waiuku Estuary. The plant is estimated to have capacity for an additional 1,000 people based on the current consent conditions.

10.33 Given the capacity constraints of the wastewater treatment plants in the West Franklin area, Watercare is consider all options to provide for growth. An option could be the development of a new sub-regional wastewater treatment plant at Clarks Beach that will service the wider area and address current compliance challenges. Watercare has initiated work to support an application for a wastewater discharge consents and expects to lodge the consent in the latter half of 2016. This is a challenging consent given the proximity to the Manukau Harbour, and therefore the timing to obtain the consent is uncertain at this stage. Once granted, a new

modular wastewater treatment plant will then be constructed to accommodate growth in the area.

10.34 It is anticipated that this plant will initially service Clarks Beach, Glenbrook Beach/Waiau, and Kingseat. It is possible that Waiuku will be connected to the new plant at a future point in time.

10.35 The estimated capital cost of the new wastewater treatment plant is approximately $76 million. This does not include any upgrades to the pipes and pump stations or the new pipes to connect Kingseat.

Kawakawa Bay

10.36 The Kawakawa Bay Wastewater Treatment Plant is a Membrane Bio Reactor (MBR) based plant. The treated wastewater is preferentially discharged into the effluent irrigation field at the Glen Forest. Waste activated sludge from the bioreactors is temporarily stored onsite before being transferred to the Mangere Wastewater Treatment Plant for digestion.

10.37 Watercare advised the Council in September 2015 that the Kawakawa Bay Wastewater Treatment Plant is consented to treat 180m3 of wastewater per day and, at present, receives 65m3 per day from 254 connections. This means the plant runs at about one third capacity and can accept more connections.

Bombay

10.38 As discussed in Mr Blow's evidence for Topics 016 and 017 the existing Bombay Wastewater Treatment Plant services six houses (approximately 18 people) and the Transpower sub-station. It is a very basic plant designed for the existing connected dwellings. The consent discharge conditions allows for a daily volume of 5m3. This equates to the average wastewater flow from approximately 22 people. There is no wastewater network.

11. CONCLUSIONS

11.1 This evidence has set out an overview of Watercare's water supply and wastewater network, which is designed to:

(a) Collect, treat and distribute drinking water; and

(b) Collect, treat and dispose of wastewater.

11.2 The evidence should be read in conjunction with the briefs of evidence referred to in paragraph 4.3 above. It is designed to provide an overview for Topics 080 and 081, and to complement the evidence of Mr Duguid for the Council.

11.3 This evidence is intended to complement the Council's zoning approach to land use. Watercare has provided technical information and evidence to inform the Council's evidence on Topics 080 and 081. Where possible, Watercare has sought to advise on the known capacity constraints within Watercare's network. This information has been provided to enable the Council's planners to make informed assessments and proposals to upzone urban areas within Watercare's current Area of Service.

11.4 This evidence outlines Watercare's bulk water supply and wastewater network's current resilience, as well as a range of projects that Watercare is currently undertaking or planning to undertake to augment that network. As significant capital work on Watercare's plants and bulk network takes place, it has greater capacity to plan for and provide infrastructure that enables upzoning. In general, Watercare has focused on areas where the built infrastructure is in place or is planned to accommodate growth.

11.5 Watercare acknowledges its statutory responsibility to give effect to the relevant aspects of Auckland Council's Long Term Plan, and act consistently with the relevant aspects of any other plan or strategy of Council to the extent specified in writing with the Governing Body. Watercare continues to work to align its significant capital works programme to ensure compliance with its consent conditions (applicable to water supply and wastewater respectively).

Mark Douglas Bourne
3 December 2015

ATTACHMENT A

QUALIFICATIONS AND EXPERIENCE OF MARK BOURNE

Qualifications & Affiliations

- Diploma in Business
- NZCE (Civil)

Key Skills

- Operating wastewater treatment plants; network infrastructure planning; capital projects; network consents; trade waste management

Work Experience

- Watercare Services Limited, 1992 – present
    - Environment & Consents Manager, 2015 – present
    - Operations Manager, 2010 – 2015
    - Operations workstream leader, 2010
    - Network Operations Manager, 2009
    - Operations Support Manager, 2006
    - Customer Services Manager, 2004
    - Trade Waste Manager, 1996 – 2003
    - Project Manager, 1994 – 1996
    - Marketing Team Leader, 1992 – 1994
- Auckland Regional Council, 1989 – 1991
- British Gas PLC, London, UK, 1987 – 1988
- Alfred Marks Technical Recruitment Ltd, London, UK, 1986 – 1987
- Wilson Industries Ltd, Brisbane, Australia, 1985 – 1986
- NZ Railways, 1981 – 1985

ATTACHMENT B

WATER TREATMENT PLANTS

Plant	Water Source
Metropolitan Plants	
Ardmore	Hunua Ranges Dams (4)
Huia	Waitakere Ranges Dams (4)
Waitakere	Waitakere Dam
Papakura	Hays Creek Dam (*currently out of service*)
Waikato	Waikato River
Pukekohe	Waikato pipeline
Onehunga	Bore
Non-metropolitan Plans	
Waiuku (3)	Bores (3)
Snells/Algies	Aquifer
Warkworth	Mahurangi River
Helensville/Parakai	Dam and springs
Wellsford	Hoteo River
Clarks Beach	Out of service
Huia Village	Lower Huia Dam
Patumahoe	Out of service
Muriwai	Springs
Buckland	Out of service
Bombay	Spring
Glenbrook	Bore
Waiau Beach	Out of service
Douglas Road	Out of service

ATTACHMENT C

WASTEWATER TREATMENT PLANTS

Plant	Receiving environment
Metropolitan Plants	
Mangere	Manukau Harbour
Rosedale	Hauraki Gulf
Army Bay	Whangaparaoa Passage
Non-metropolitan Plans	
Pukekohe	Parker Lane Stream / Waikato River
Waiuku	Waiuku Estuary
Beachlands	Land, Local Creek, and Hauraki Gulf
Snells / Algies	Inner Channel, Hauraki Gulf
Warkworth	Mahurangi River
Helensville	Kaipara River
Clarks Beach	Waiuku Estuary
Wellsford	Hoteo River
Waiwera	Waiwera Estuary
Omaha	To forest and Mangatawhiri Spit
Kawakawa Bay	Plantation forest
Kingseat	Local Creek / Manukau Harbour
Denehurst Drive	Local disposal field
Owhanake	Local Creek / Hauraki Gulf
Bombay	Local disposal field