BEFORE THE HEARING PANEL

IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of Proposed Plan Change 12 to the Operative Hamilton City District Plan

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STATEMENT OF EVIDENCE OF JACQUELINE MAREE COLLIAR

Dated 20 December 2022

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INTRODUCTION

1. My full name is Jacqueline Maree Colliar.

2. I am the Strategic Waters Infrastructure Unit Manager at Hamilton City Council (**HCC**). I am authorised to provide this evidence on behalf of HCC.

3. I hold a Bachelor of Natural Resources Engineering (Hons). I have over 20 years' experience in Environmental Engineering, Strategic Waters Infrastructure planning and development working in and for public and private sectors.

4. I have been employed by HCC for 7 years and have held several roles including Infrastructure Engineer, Strategic Manager – Infrastructure. In my current role, I am also responsible for managing the strategic planning for three waters infrastructure that identifies investment needs and informs, amongst other things, the HCC Water, Wastewater and Stormwater Asset Management Plans (**AMP**), 10 – Year Long Term Plans; 30-Year infrastructure strategies; and supports evaluation of development proposals and external funding opportunities and negotiations.

5. My role in PC12 has been to co-ordinate the Development Group responses to City Planning Unit questions related to HCC's Three Waters systems ability to service growth. I have also managed and reviewed the delivery of the Three Waters Traffic Light Assessment (**TLA**) Report.

CODE OF CONDUCT

6. I am of Waikato and Ngaati Mahuta descent. I have been an elected member of Te Whakakitenga o Waikato Incorporated (**Te Whakakitenga**) since 2002. I have also served as an elected member of Te Arataura, the executive board of Te Whakakitenga since 2017. I am also a Crown-

appointed member of the Waikato River Authority and hold several directorships and trustee roles with public and private entities.

7. Through my professional and other roles, including with Te Whakakitenga and the Waikato River Authority, I have expertise and knowledge regarding Te Ture Whaimana o te Awa o Waikato (Vision and Strategy for the Waikato River) (**Te Ture Whaimana**) which I am able to apply in my professional role within HCC. I have read the evidence of Julian Williams on behalf of HCC and rely on that evidence in relation to its explanation of Te Ture Whaimana, which I consider to be an accurate account. My evidence is confined to the matters within my professional expertise, as set out in the scope section below, and is given on behalf of HCC. This evidence does not represent the views of either Te Whakakitenga or the Waikato River Authority.

8. I have read the Environment Court Code of Conduct for expert witnesses contained in the Environment Court Practice Note 2014 and agree to comply with it. I confirm that the opinions expressed in this statement are within my area of expertise except where I state that I have relied on the evidence of other persons. I have not omitted to consider materials or facts known to me that might alter or detract from the opinions I have expressed.

SCOPE OF EVIDENCE

9. This evidence presents an overview of the Three Waters networks within Hamilton City. It outlines each of the networks and identifies key constraints affecting that infrastructure. The evidence describes HCC's approach to infrastructure planning and how development influences infrastructure investment programmes and network policies, including the HCC Three Waters Connections Policy. The evidence comments on the impacts increased residential densities will have on existing and future

networks and investment programmes. It also briefly addresses the implications of the recent statutory reforms relating to Three Waters.

10. The evidence is intended to present the Panel with an overview of the Three Waters systems and the existing constraints, so that it can have a practical 'baseline' of information against which to consider HCC's approach to the implementation of the Resource Management (Enabling Housing Supply and Other Matters) Amendment Act 2021 (**Housing Amendment Act**) and in particular its reliance on Te Ture Whaimana as a Qualifying Matter (**QM**).

11. The evidence does not extend to a detailed analysis of the Three Waters networks and how those networks will respond to residential intensification, nor does it address the detail of HCC's infrastructure response to the proposed changes introduced through Plan Change 12 (**PC12**). That detailed technical evidence will be presented at the substantive hearing later in 2023.

EXECUTIVE SUMMARY

12. Hamilton City's Three Waters systems were designed and constructed to service development densities and to provide levels of service that were considered appropriate at that time. In many areas of the City, the original design levels of service and densities do not reflect current requirements and system performance expectations or provide for plan enabled development capacity, or densities anticipated through the National Policy Statement on Urban Development (**NPS-UD**) and Medium Density Residential Standards (**MDRS**).

13. Today's environmental, social, and cultural expectations and regulatory obligations require levels of service and performance that are significantly higher than delivered historically. Consequently, Hamilton City's existing

Three Waters systems have performance challenges to varying degrees across the City already. The City's Three Waters infrastructure cannot accommodate the levels of urban intensification already enabled by the District Plan or that proposed by the MDRS and the NPS-UD without significant investment.

14. Hamilton relies on the Waikato River as its sole source for water supply, and discharges treated wastewater and urban stormwater to the river. The Waikato River is not an infinite source of water and has a limit on the contaminant loads it can receive. These environmental limits present significant challenges to the City that require investment to address both asset investment (treatment and network upgrades, new storage, leakage and infiltration and ingress reduction, more integrated urban stormwater solutions) and non-asset investment (e.g., education and policy related interventions that support more holistic waters planning and behavioural change)). These water allocation and contaminant load environmental limits apply to the whole City and not to discrete areas.

15. To deliver the intensification already enabled in the District Plan, and contemplated through the MDRS and NPS–UD, without significant investment would lead to system failures including increased wastewater overflows and inadequate treatment; water supply systems that cannot meet demand or fire-fighting requirements; increased contaminant loads, discharge velocities and volumes from stormwater systems; and increased flood risks. The system failures would further degrade the receiving environment, further impact on cultural values and increase public health and safety risks. These impacts and outcomes are inconsistent with Te Ture Whaimana and the National Policy Statement – Freshwater Management (**NPS-FM**).

16. Te Ture Whaimana sets out an obligation to deliver 'betterment' to the Waikato River, and not simply to avoid, remedy or mitigate environmental

effects. The NPS-FM puts the health and well-being of water bodies and freshwater ecosystems first, the health needs of people (such as drinking water) are second and the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future is third in the hierarchy.

17. In addition to these regulatory drivers, catchment planning and infrastructure investments should provide for more resilient communities by reducing demand on the natural environment and through land use decisions that avoid creating or exacerbating natural hazards.

18. Solutions are available to address the infrastructure challenges, improve the health and wellbeing of the Waikato River from the current baseline, and deliver more resilient communities founded on the core principles of Te Mana o te Awa and Te Mana o te Wai.

19. Supporting densification will require significant investment on top of what has previously been identified in master plans and Long-Term Plan (**LTP**) funding requests. The level of investment needed to implement the necessary solutions is beyond HCC's ability to sustainably afford. These financial constraints supports the need to prioritise where MDRS and higher-density residential development is enabled.

20. In addition to financial constraints, delivering strategic infrastructure takes time and should not be approached in a reactive or ad hoc manner. For example, the consenting processes necessary to secure approval for major infrastructure projects such as treatment plants, discharges, reservoirs, bulk wastewater storage facilities, blue/green corridors and pumpstations and trunk programmes can take many years. The time to complete designs, procurement, construction and commissioning can also take many years.

21. Just adopting MDRS as per the Housing Amendment Act without a clear and committed infrastructure investment and delivery programme is expected to increase network failures and result in environmental, social and cultural impacts that are inconsistent with Te Ture Whaimana and other regulatory drivers. A targeted approach to increased densities is required to enable deliberate and deliverable infrastructure plans to be developed and ensure the investment needed to service the increased densities is in place at the right time.

22. There will be areas of the City where the existing networks may have capacity to service development with or without investment. HCC proposes to use the Three Waters Connections Policy to control development where network and system constraints exist.

BACKGROUND

23. Ensuring there are well-functioning Three Waters infrastructure systems within Hamilton City is a critical function of HCC. The ability for those systems to manage the growth within the City to acceptable standards is central to all infrastructure planning. District Plan provisions which enable where and how growth can occur are a key driver in how the systems are planned and managed.

24. District plan provisions alongside other factors (such as economic feasibility and national and regional demographic profiles) inform growth projections which are then used for strategic infrastructure planning and identifying investment programmes needed to provide adequate Three Waters services.

25. Hamilton City's existing Three Waters systems were designed and constructed to service densities and provide levels of service considered appropriate at the time they were developed. The densities used to design

the existing system do not reflect current plan enabled development (such as duplexing provisions) or those anticipated through the NPS-UD and MDRS.

26. The existing Three Waters system already have performance issues and challenges which are constraints to further growth. System performance assessments and strategic infrastructure planning has recommended investment programmes needed to service growth, however not all recommended investments have been funded.

27. Current strategic planning and investment programmes have not been developed to cater for current plan enabled capacity. Enabling further residential intensification across all parts of the residential zones in Hamilton, in an untargeted manner, would further exacerbate existing Three Waters servicing issues.

28. Unless increased densities are targeted, HCC would be unable to plan, deliver, and manage the Three Waters infrastructure successfully to ensure it was giving effect to Te Ture Whaimana. Development would occur in a manner which places demand on infrastructure which cannot be managed appropriately, leading to network failures, increased public health and safety risks, regulatory breaches, and prosecutable non-compliances.

29. PC12 seeks to introduce new plan provisions which enable increased levels of residential intensification in the City. It seeks to do so in a targeted manner. This approach attempts to enable HCC to take a more strategic and efficient approach to infrastructure planning and delivery so that development occurs in a manner consistent with the provisions of Te Ture Whaimana. Locations for which PC12 targets growth have been determined by land use drivers, not necessarily the state of the existing network capacity.

30. This evidence presents the key infrastructure considerations which inform HCC's decision on how to implement the MDRS and Policy 3 requirements of the Housing Amendment Act. It also explains why the proposed plan provisions are necessary to accommodate a matter required to give effect to Te Ture Whaimana under s 77I(c) of the Resource Management Act 1991 (**RMA**).

EXISITING THREE WATERS INFRASTRUCTURE

31. **Appendix 1** provides a basic outline of the City's strategic Three Waters networks and high-level information on existing stormwater management challenges across the City. A brief outline of the key features of the systems is provided in this evidence. Detail on the existing system components, current and predicted system performance and constraints, and current and future investment needs are included in in the TLA. The TLA is Appendix 3.5 to the Section 32 report.[1]

Consented Limits

32. HCC holds a suite of consents from Waikato Regional Council (**WRC**) for taking water from and discharging treated wastewater and stormwater to the Waikato River as required by the Waikato Regional Plan (**Regional Plan**).

33. These consents impose conditions setting specific parameters or limits for managing the respective activities. A basic summary of the limits and key requirements that exist for each suite of consents for each of the Three Waters is outlined below.

[1] https://storage.googleapis.com/hccproduction-web-assets/public/Uploads/Documents/Content-Documents/Property-Rates-and-Building/PC12-Growing-Up/Plan-Change-documentation/Section-32/s32-Appendix-3.5-Three-Waters-Performance-Assessment-Report.PDF

34. The consenting framework established through the Regional Plan is a key mechanism for WRC to carry out its own statutory functions regarding the sustainable management of natural resources including statutory obligations arising from Te Ture Whaimana and the NPS-FW.

35. As the consent holder, HCC must ensure it complies with the conditions of those consents. Balancing infrastructure planning and investment, with controls on the location, type (e.g. demand profile), and timing of land-use is a critical method to ensure compliance.

36. The renewal of each consent is expected to involve reconsideration by WRC of appropriateness of the requirements, including water take volumes and discharge parameters, to ensure any renewed or new consents reflect newer policy requirements and information on the current and projected future state of the Waikato River.

37. In general, this is expected to result in more onerous requirements reflecting the progressively increasing demand on our natural water systems, the impacts of climate change on the environment, and the increasing importance being placed on the sustainable use of scarce water resources. This would then prompt the reconsideration of infrastructure planning and investment and land-use controls in order to ensure compliance.

38. HCC anticipates that future municipal water, wastewater and stormwater consents authorising the City's water activities (including consented water take volumes and discharge contaminant concentrations and loads) will become more stringent over time. Particularly given the evolving regulatory environment including better recognition of Te Ture Whaimana and increasing pressure that has been placed on the Waikato River as a whole since the existing consents were granted (i.e. between 2007 and 2011).

39. HCC also anticipates the requirements for the restoration and protection (effectively betterment) of the River will become paramount in any decision making regarding activities which affect the River. This places HCC in a unique position regarding Three Waters infrastructure. No other municipal entity in New Zealand builds and operates its Three Waters infrastructure in a context where the receiving environment calls for restoration and improvement. Typically, the adverse effects of development relating to Three Waters are required to be managed by a public infrastructure response that avoids, remedies and mitigates effects to an acceptable level. In Hamilton, these effects need to be managed so that there is, over time, an improvement in the receiving environment, where the River is restored and protected from further degradation. This is a high bar. Renewed consents will increasingly reflect this threshold.

Potable Water

40. HCC provides Hamilton's residents and businesses with a safe, high-quality, reliable, and sustainable service through treatment, distribution, and management of Hamilton's water supply.

41. Hamilton City currently relies on a single water treatment plant to produce potable water. The plant is located at the southern end of the City and draws water directly from the Waikato River. Raw water is drawn from the Waikato River into the Water Treatment Plant where it is treated to provide a high standard of drinking water. The HCC potable water supply system is made up of a single treatment plant (located at the southern end of the city), nine reservoirs, demand management zones and over 1,250 km of associated pipe network. HCC's reticulation network currently supplies a population of approximately 180,000 people.

42. HCC has resource consents authorising the abstraction of water from the Waikato River for municipal water supply purposes. The primary

abstraction consent (AUTH 113941) was granted in 2009 and expires in 2044 and includes conditions including:

a) "Stepped" limits on the maximum daily abstraction volume (cubic metres per day) and the maximum take rate (cubic metres per second). These limits and future issues associated with consented water allocation are discussed further below.

b) Restrictions on use of water for high water use industrial activities.

c) Recording, monitoring and reporting requirements including daily take information, monitoring of environmental effects of the take; periodic reporting on water conservation and demand management; periodic reporting to confirm maximum daily take volumes; annual monitoring reports.

d) Establishment and function of a Water Steering Group with Waikato-Tainui.

43. The water take consent provides for increases in maximum daily take volumes to meet demand, starting from 105,000 cubic metres per day in 2009 to 146,315 cubic metres per day from December 2038.

44. HCC can apply to WRC every 6 years to move to the next 'step' and increase the maximum daily take volume for that step. The final step in the current consent allows HCC to obtain a maximum daily take volume of 146,315 m^3 per day. This stepped approach aims to ensure that, as the City grows, the amount of water HCC can take from the river can meet increased demand.

45. The Water Treatment Plant has a current peak production capacity of 106,000 m^3 per day, which results in a maximum daily abstraction capacity of 111,000 m^3 per day. Currently, the sustainable peak treatment capability of the plant is about 78 million litres per day. During summer, peak demand has reached up to approx. 90 million litres per day and in the

evenings a large portion of the demand for water is met from reservoir storage.

46. The City has nine reservoirs located across the City and surrounding areas, providing a total effective storage volume of approx. 112 million litres. Water storage equivalent to a minimum of peak daily demand is required for emergency purposes. As the City grows, additional reservoir storage will be required for emergency purposes; to meet water supply demand during peak periods; and to provide adequate system resilience.

47. A storage shortage of approx. 80 million litres is anticipated by 2061 (based on 2021 LTP population projections). Infrastructure master planning completed for the 2021 LTP recommended construction of an additional six reservoirs to address the storage deficit. The timing and volume of the six new reservoirs and any additional reservoirs arising from further growth will be linked to actual growth in demand.

48. The 'stepped' take volumes in the HCC consent were based on growth forecasted at the time of consent. These forecasts do not reflect the rate of growth experienced in HCC in recent times for both residential and non-residential land use activities, nor the current plan enabled development capacity proposed by the NPS-UD and MDRS. In 2020 HCC secured a step up to a maximum daily take volume of 125,315 m^3 per day.

49. Before 2044, a renewed consent will be required which will need to extend the allocation beyond 146,315 m^3 per day. To service projected growth out to Year 2065[2], it is estimated that the maximum water demand will be in the range of 159,000 to 184,000 m^3 per day.

50. The Metro Spatial Plan (**MSP**) area is forecast to grow to approximately 430,000 people by 2065. Applying the same water demand assumptions

[2] Growth Projections produced by Hamilton City Council to support the 2021 Long term planning processes

to the additional MSP area, by 2065 the total water demand is estimated to increase to 217,000 m^3 per day.

51. Given the water demand for HCC and the MSP area in the medium and long-term, it is likely that there will be insufficient water available to allocate from the Waikato River to service the needs of the growing population. This results from the current state of water allocation from the Waikato River coupled with the low rates of surrender of existing allocations and allocation "claw-backs" that occur at the time of consent renewals, i.e., when consents are renewed but at a lower allocation.

52. Various initiatives exist, or are already planned, to make better use of the scarce water resources. These include implementing a water loss management programme, Smart Water education (e.g. Water Alert Levels), metering commercial, industrial and extraordinary users. Universal water metering is recommended in the Water Master Plan but funding has not been approved in the 2021 LTP. A funding decision will be required in the 2024 LTP and will be necessary in order to manage water to not exceed the current water take consent limits.

Wastewater

53. HCC's current wastewater system comprises of a single centralised Wastewater Treatment Plant (**WWTP**) located at the northern end of the City; five strategic interceptor pipelines; over 130 pump stations and over 800 km of connecting pipework. The system services over 50,000 households and provides trade waste services to over 5,000 commercial and industrial premises.

54. The wastewater network receives and conveys back wash from the Water Treatment Plant to the WWTP, and while it is not a combined wastewater/stormwater system by design, under wet weather flow

conditions the network does receive considerable levels of surface and groundwater infiltration and ingress.

55. HCC has a suite of resource consents authorising treatment and discharge activities associated with the WWTP. The primary wastewater discharge consent (AUTH 114674) was granted in 2007 and expires in 2027. The discharge consent includes a number of conditions such as:

a) Maximum daily limits on discharge volume to the Waikato River;

b) Concentration and/or mass load limits (these include monthly, quarterly and seasonal limits) on key parameters including cBOD5, total suspended solids, total nitrogen, total phosphorus, and *E.coli;*

c) Monitoring, planning, inspection, notification, and reporting requirements; and

d) Establishment and function of Tangata Whenua Wastewater Liaison Group.

56. Compliance with fixed contaminant mass load limits (particularly nutrients) over summer is only just being managed with the current technology of the WWTP. Compliance with fixed mass limits for specific contaminants will become more difficult with increasing wastewater volumes that accompany growth.

57. HCC has a programme for upgrading the WWTP to increase treatment capacity. This includes consideration of significant retrofits to implement technologies that can better respond to increasing pressure on mass limits compliance and to remain compliant with the current discharge consent limits and reductions in mass limits that will likely accompany new wastewater discharge consents post-2027.

58. To support future planning and broader sub-regional considerations, HCC alongside neighbouring local authorities (Waikato and Waipa District), Iwi and Mana Whenua have completed strategic assessments and detailed business cases that identify preferred options to meet the future wastewater treatment needs of the Waikato Metro Area. This work has focussed on investment to contribute toward the restoration and protection of the Waikato River and support growth. The detailed business cases have been approved by HCC, Waikato DC, Waipa DC and Waikato-Tainui. Key recommendations from this work include:

    a) Upgrades to the Pukete WWTP to deliver necessary significant reductions in contaminant mass loads to the Waikato River (e.g., nutrients and microbial contaminants);

    b) Decommissioning the existing Ngaaruawahia WWTP and conveying wastewater from the Northern Metro communities for treatment at the Pukete WWTP; and

    c) Development of a new Southern Sub-Regional WWTP to meet the future needs of Hamilton, Airport and surrounding environs.

59. These recommendations have informed the 2021-2031 LTP and 2021-51 Infrastructure Strategy and will be included in future funding requests. Significant additional (unfunded) investment will be required to deliver the necessary treatment capacity and standards endorsed through the recent Metro Wastewater work. Implementing the recommendations is also subject to consenting and designation processes which can take many years to complete. The physical upgrade works and new plant commissioning also takes many years to complete. Demand may exceed available treatment and discharge capacity while these processes are being worked through.

60. While HCC has an investment programme to upgrade and maintain the wastewater network (including new and upgraded interceptors and

pipelines, pump stations, large wastewater storage facilities and network renewals) wastewater overflows from the network do occur as a consequence of wet weather flow conditions, network blockages (such as those caused by the accumulation of fats, wet wipes or other material introduced to the network), illegal network cross connections from the wastewater network to the stormwater network (or vice versa) or system failures (for example mechanical or electrical failures).

61. HCC does not hold resource consent(s) to authorise wastewater overflows from the network to the environment either via the stormwater network or directly to land or water. To date, HCC has sought to ensure that sufficient network capacity is available to service existing communities and growth under dry weather conditions and certain wet weather conditions, and provide for growth through planned network upgrades, and where it has been considered acceptable, reduced levels of service which ultimately reduces system resilience. There are a few instances where interim solutions such as privately owned and operated wastewater storage devices have been accepted. These do not deliver resilient or reliable wastewater networks, in fact they increase the risks of network failure and adverse cultural, social and environmental impacts. Allowing interim solutions resulting in a proliferation of onsite storage devices as a means of addressing wastewater network capacity constraints is, due to the performance risks attached, contrary to HCC's obligations set out in Te Ture Whaimana.

62. HCC also has an investment programme targeted at maintaining and reducing infiltration and ingress into the wastewater network; to contain wet weather flows and to reduce wet weather overflows from the network to the environment. WRC has taken enforcement action against HCC due to unlawful discharges from the wastewater network. Hamilton City has been prosecuted on several occasions (including in the past 2 years) due to

overflows from the wastewater network and the resulting environmental, cultural and social impacts of those overflows.

63. HCC expects the performance of our wastewater system and any overflows (including the unconsented overflows that occur routinely under wet weather conditions) to be subject to increasing scrutiny from WRC, Iwi, Mana Whenua and the community. Even without the introduction of MDRS, this will likely require additional investment from that currently recommended to maintain and improve the overall performance of the system in line with regulatory drivers.

Stormwater

64. The stormwater system collects, diverts, conveys, treats and discharges rainwater to land or surface water. Its functions include protecting the health of people, preventing and reducing the risk of habitable building inundation from flooding and minimising the pollution of urban waterways. The stormwater system comprises the piped network, including inlets and outfalls, artificial drains; stormwater treatment devices such as ground soakage, raingardens and constructed wetlands; and natural features such as gullies and streams, and the Waikato River or lakes to which the stormwater is discharged. The stormwater system also includes overland flow paths, which may lie anywhere - on roads, parks or private property.

65. The system drains an urban catchment of approximately 9,000 ha however the total catchment area draining to the City reach of the Waikato River is much larger at approximately 30,000 ha. The stormwater system is also used to discharge potable water during the maintenance of reservoirs and flushing and testing of fire hydrants.

66. HCC holds a comprehensive stormwater discharge consent (**CSDC**) from the WRC authorising the discharge of stormwater from the City's stormwater

network principally to the Waikato River via separately consented outfall structures. The CSDC (AUTH 105279) was granted in 2011 and expires in 2036. The CSDC includes various requirements, including avoiding as far as practicable and otherwise minimising discharges that are likely to adversely affect aquatic ecosystems (this includes a list of parameters to avoid creating in the stormwater receiving environment e.g. specific ranges on pH, dissolved oxygen, temperature, suspended sediments, nitrogen), preparing and implementing catchment management plans, stormwater monitoring and reporting.

67. Integrated catchment management plans (**ICMPs**) are being developed for each of the City's stormwater catchments to make sure stormwater infrastructure is planned, developed and managed in the most efficient and practicable way for the specific catchment. There are different options for dealing with stormwater and the most efficient approach depends on the specific catchment.

68. The stormwater purpose of ICMPs is to:

a) Provide guidance to developers and regulatory bodies on how stormwater from new developments will be managed and integrated with other water services and proposed future land uses;

b) Minimise the need for stormwater treatment and detention devices;

c) Propose opportunities for the reuse of stormwater to reduce water demand;

d) Minimise stormwater and the effects of urbanisation on river and streams;

e) Lessen flood hazards on private property; and

f) Involve other stakeholders (such as taangata whenua, recreational and local interest groups) who may wish to contribute to the management of the catchment's waterbodies.

69. New or additional discharges arising from greenfield development and intensification and infill are not automatically authorised under the CSDC. For large scale development new discharge consents are generally secured by the developer. In most cases these consents are then transferred to HCC as part of the vesting of assets. HCC will usually then seek certification from the WRC that the new discharge is consistent with the requirements of the CSDC so that the consent can be subsumed into the CSDC (a process established within the CSDC). This reduces the administrative burden arising from holding multiple discharge consents held by HCC and monitored and enforced by WRC.

THREE WATERS NETWORK INFRASTRUCTURE PLANNING AND FUNDING PROCESS

70. Given the significant and varied statutory responsibilities of HCC, we follow a robust, structured approach to Three Waters system infrastructure planning and investment. Understanding this process, even at a high level, will assist in understanding subsequent evidence regarding the current state of the network.

71. Some of the key elements to this process are outlined as follows. Given the nature of the work and the need to align with the timeframes of other processes, in particular funding processes and growth projection reviews, as soon as one cycle completes the next needs to be starting.

Confirm technical and regulatory requirements

72. As part of each infrastructure master planning and funding cycle, HCC (re)confirms the overall system of management and performance objectives, including reviewing system performance against drivers associated with meeting regulatory obligations, responding to technical constraints, and maintaining or achieving necessary or desirable operational levels of service.

73. The drivers include matters outlined in relevant national and regional policy statements and plans and standards; other relevant national, regional or local strategies, policies, and plans (including climate change adaptation, sustainability and resilience strategies and policies); consent limits and other compliance parameters; established design standards (e.g. Regional Infrastructure Technical Specifications); and targets to address identified existing network deficiencies (i.e. resilience, capacity, age or condition related matters).

Confirm land-use and growth assumptions

74. Land-use, growth projections (using specified time periods and by area) and plan enabled capacity (i.e., city full) assumptions need to be confirmed as key assumptions for infrastructure master plans. These are critical inputs to modelling work and ultimately help inform decision-making on the timing and sequencing of infrastructure projects and programmes.

Infrastructure master planning

75. HCC's Strategic Waters Infrastructure Unit leads comprehensive technical analysis including system performance modelling (especially for Water and Wastewater networks and flood hazard assessments), and optioneering work to develop an infrastructure master plan for each of the Three Waters

in response to the technical and regulatory requirements, land-use and growth.

76. As part of the master planning process short, medium, and long-term investment programmes are recommended. The recommended investment programmes focus primarily on capital investments, however operational improvements and other non-asset interventions and solutions are often included in the recommendations.

77. The investment programmes recommended include timing, sequencing and costings. These form the basis for funding proposals to inform the LTP process. This work also considers and identifies strategic infrastructure needed to service large development areas (in particular, greenfield areas) that HCC would typically expect to be primarily funded by growth.

78. Developers are expected to directly pay for local and in some cases trunk infrastructure, and to contribute to trunk and strategic infrastructure through development contributions for infrastructure that HCC delivers up front. Where there is no funding for necessary trunk or strategic infrastructure upgrades, the developer would be expected to fund or provide the necessary infrastructure or wait until that lead infrastructure is in place.

79. The time taken to review and update each of the master plans depends on a range of factors, including the availability of key inputs, in particular the availability of the necessary growth and land-inputs and the scale of changes (arising from revised growth assumptions, legislative drivers and level of service targets) required compared to previous work. Updating an infrastructure master plan normally takes between 18 and 24 months.

80. Failing to produce robust analysis has the potential to result in the sub-optimal investment programmes that deliver reduced benefits, result in lost opportunities or fail to identify critical investment needed to ensure

that statutory obligations are met and adequate levels of service are maintained.

10-Year Long-Term Plan Funding Process

81. Every three years the funding of infrastructure projects and programmes are considered alongside other matters competing for funding through the statutory 10-Year LTP and 30-Year Infrastructure Strategy process. This process prioritises, and ultimately determines, which proposed projects or programmes are to be funded, and how, in accordance with HCC financial strategies and policies. This determines the setting of rates, development contributions, and what projects HCC will and will not proceed with over the 10-year term.

82. Not all of the investment recommended through the master planning processes are funded in the LTP and so a funding deficit to maintain and improve levels of service for current growth projections already exists. The infrastructure investment deficit will be exacerbated by further intensification.

Implementation of the programme

83. LTP-funded projects and programmes are then advanced and the potential risks arising from not funding infrastructure projects are noted for monitoring.

84. While the comprehensive nature of the infrastructure planning means that all necessary projects are identified, whether they make it into the LTP, and in what year, is determined at a political level, and often involves a series of competing interests and priorities. HCC has never been in a position to fund all necessary projects in one LTP cycle, and even then, many projects get pushed progressively towards the later years through each annual plan,

and ultimately remain undelivered. It is only the highest priority projects that are funded and delivered.

85. For example, HCC has over $1 billion of unfunded infrastructure projects in the first ten years of the 30-year Infrastructure Strategy. For the Three Waters asset classes, these unfunded projects total $399 million:

a) Water $145 million;

b) Wastewater $204 million; and

c) Stormwater $49 million.

86. The Infrastructure Strategy indicates significant future funding challenges and estimates a requirement for $12.8 billion of capital investment over the next 30 years to meet the City's current needs. While this includes investment in sub-regional infrastructure to service growth outside Hamilton City's boundaries, such as HCC's anticipated share of $244 million for a new WWTP and $336 million for a new Water Treatment Plant, it has not fully captured the needs of infill and intensification plan-enabled capacity, expanding growth areas outside the current City boundary nor the potential full extent of the recent NPS-UD changes and its intensification expectations.

87. From time-to-time opportunities arise that may allow the progression of unfunded projects, for example, through Private Developer Agreements, or grants such as the Infrastructure Acceleration Fund. Key to participating in such opportunities is the need to have developed an understanding of what infrastructure is needed, where and when.

88. As will be apparent, in such a competitive funding environment, it is impossible to develop and fund an infrastructure programme that upgrades all parts of the City networks. Identifying a strategic set of

priorities, and targeting growth areas, is the only efficient and sustainable approach.

CURRENT STATE OF THE THREE WATERS NETWORK

The brownfields/infill networks

89. Modern Hamilton City has developed from an area centred around the Central City from the late 1800s and has progressively expanded overtime. **Appendix 2** includes a diagram showing the indicative spatial development of the City over time.

90. The City's Three Waters systems have also developed overtime and have been designed and constructed to provide levels of service considered appropriate when they were developed and to respond to densities planned for at that time.

91. In many areas of the City (particularly areas urbanised before the early 2000s) the design standards and approaches do not reflect current requirements, and the capacity of these networks are based on lower densities than current requirements and have not been designed to service plan enabled capacity, or those anticipated through NPS-UD and MDRS.

92. For example, stormwater networks in Hamilton up until around the early 2000s were designed purely for drainage purposes. No or minimal treatment was considered necessary, imperviousness assumptions reflected land use up to that time and rainfall assumptions did not consider the impacts of climate change.

93. These historic approaches and assumptions are no longer appropriate resulting in reduced levels of service being provided through these networks or impacts that are no longer acceptable and require significant

retrospective investment in order to achieve regulatory obligations, including to "*restore and protect the Waikato River*".

94. Water and wastewater reticulation and distribution networks were designed and installed to service development densities typical of the time, and commonly were based on less than 16 dwellings per hectare.

95. Intensification will impact on the networks ability to meet the necessary fire fighting standards, therefore require upgrades or acceptance of levels of service below fire fighting standards which is not considered appropriate for Hamilton.

96. Wastewater networks were designed to convey peak wet weather events up to a certain return period (based on wet weather flow assumptions) beyond which they were designed to overflow into the stormwater system and the receiving environment. Infiltration and ingress into the network being experienced as a result of increased runoff and network conditions is increasing the frequency of these overflows, delivering a lower level of service than originally designed for. Furthermore, while the original wastewater overflow level of service may have been accepted or tolerated historically, HCC is under increasing scrutiny and pressure to address wet weather overflows in order to address environmental, cultural and social impacts and satisfy regulatory obligations, including Te Ture Whaimana and NPS-FM.

97. Upgrading these networks in order to meet today's environmental, social and cultural expectations and regulatory obligations requires levels of service and performance that are significantly higher than delivered historically. Te Ture Whaimana sets out an obligation to deliver 'betterment' to the Waikato River, and not simply to avoid, remedy or mitigate environmental effects.

98. In addition to these regulatory drivers, the anticipated impacts of climate change are now better understood. Catchment planning and infrastructure investments should provide for more resilient communities through land use decisions that avoid creating or exacerbating natural hazards; investment in measures to reduce demand on the environment including through physical / asset (treatment improvements; network upgrades; leakage reduction; infiltration and ingress reduction; overland flow path and blue green corridor creation and protection) and non-asset based solutions (e.g. education, policy, planning).

99. These elements are all critical factors that need to be considered in planning, managing and investing in the City waters systems to meet future needs. In short, the existing networks are already under considerable capacity constraints, and the regulatory environment within which HCC renews and upgrades the networks mean that upgrades across the entire network without any identified priority areas is unaffordable and cannot realistically be delivered.

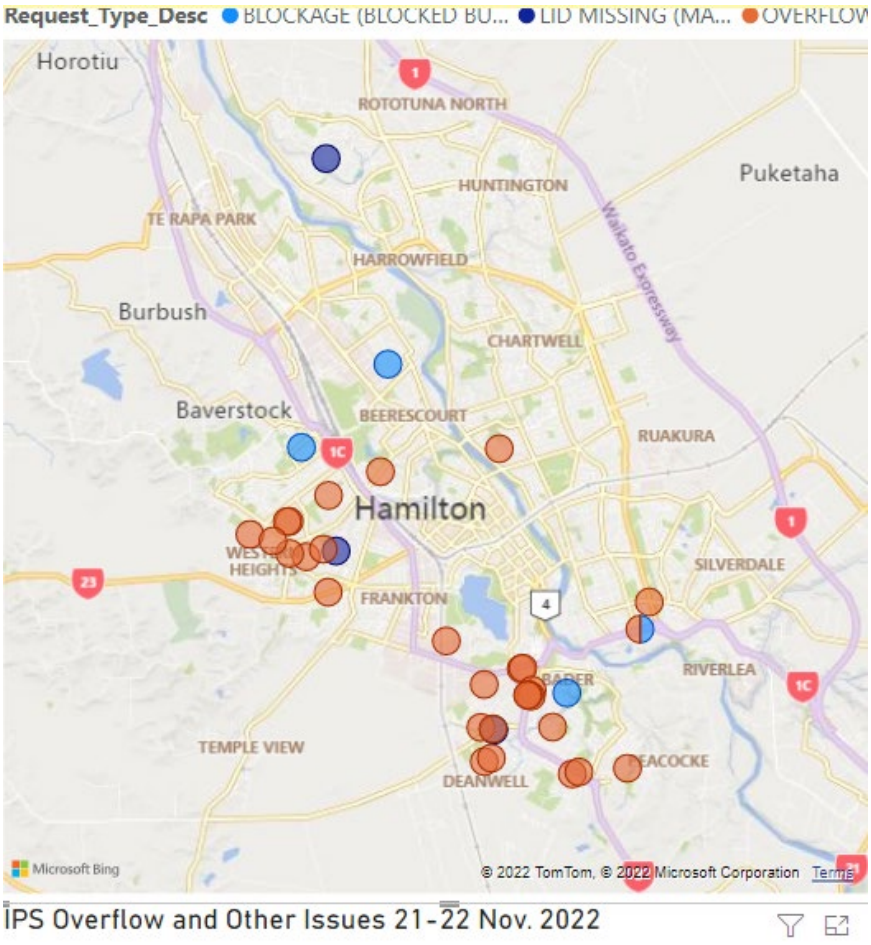
100. Retrofitting strategic upgrades within the brownfield's environment (such as water reservoirs, bulk wastewater storage facilities, stormwater treatment devices will require suitable sites which may be difficult and costly to secure. Major upgrades to networks in brownfield areas will also be disruptive and will need to be carefully co-ordinated across all waters and other utilities to deliver an efficient upgrade programme.

101. Existing information based on previous master planning and growth assumptions is available that demonstrates that the City's infrastructure network in general is not capable of supporting the existing District Plan-enabled densities and projected growth without resulting in failures, breaches of consent, and consequential impacts on the environment. This creates conflicts with the objectives of Te Ture Whaimana which seek protection and restoration, and no further degradation of the Awa.

Recent examples of network failure

102. System or systemic failure impacting on cultural and environmental values, are at times in breach of HCC's consents resulting in enforcement action by WRC. WRC has taken action against HCC on several occasions in recent times due to wastewater network overflows and discharges. By way of recent example, in late November 2022 Hamilton experienced a moderate rainfall event. Over 21-22 November 2022 dozens of wastewater overflows were reported as depicted in Table 1 below. One of the more significant failures resulted in contamination of the Maangakootukutuku stream. Mana whenua exercised their mana whakahaere in response to wastewater overflows during this event and placed a Rahui over that stream. Uncontrolled discharges such as this are not authorised by HCC's current discharge consents.

Table 1: 21-22 November 2022 overflows



103. These examples of system failure and resulting impacts would be expected to increase as a consequence of continuing to enable intensification without addressing the adequacy of infrastructure.

Network capacity constraints

104. In light of these clear signals highlighting the vulnerability of the networks, HCC reviewed the capacity of the existing brownfields and greenfields networks to determine their capacity to meet the demands of residential intensification as required under the Housing Amendment Act. HCC prepared a TLA as part of its preparation of PC12 to investigate the state of the network using existing information to determine the nature, scale and extent of infrastructure capacity. The TLA is Appendix 3.5 to the Section 32 Report.

105. City-wide constraints such as water allocation and WWTP discharge limits are mentioned in the TLA but do not influence the colour-based categorisation of areas. This evidence outlines these higher order consenting limits. The TLA report focuses more on the reticulation network components of the wider infrastructure network.

106. Based on existing available information, the TLA report considers a range of factors in order to provide an indicative snapshot of the current capability of the network to provide for growth. This is visually depicted in the TLA using colour coding for defined parts of the City. Factors considered relevant to determining the state of the network, for which information exists, included:

a) Water Supply:

I. Head loss; and

II. Minimum pressure/ firefighting standard compliance.

b) Wastewater Network:

I. Local and trunk pipeline utilisations under dry weather flow conditions (winter);

II. Local and trunk wet weather overflows; and

III. Strategic interceptor pipeline utilisation under dry weather flow conditions (winter).

c) Stormwater System:

I. Flood hazards.

II. Discharged water quality, volumes and velocities.

d) Watercourse quality risks:

I. Watercourse erosion risks; and

II. Ecological health.

107. Notably, the TLA inputs use older growth projections (which are lower than current projections and do not reflect the current plan-enabled capacity in the District Plan), and do not reflect the greater impact of proposed PC12 or unconstrained MDRS increases in density. This means the TLA results represent a 'best-case' baseline, which if modified with newer growth projections and PC12 or MDRS densities would demonstrate even greater capacity constraints.

108. The TLA demonstrates that no part of the City is unconstrained with respect to Three Waters. Some parts of the City may be in a better state with one water, but not the others.

109. In testing the capacity of the Three Water systems, the TLA assessment criteria focussed largely on network performance, impacts and investment needs each of the discrete areas. It is however important to acknowledge other strategically important system wide challenges facing the City. These challenges have not been specifically included in the performance assessments as they are largely independent of the geographic locations of development and intensification. They include:

(a) Water allocation constraints. i.e. recognising the finite water resources available from the Waikato River to service growth
(b) Environmental limits of the Waikato River to receive contaminants arising from urban land uses (wastewater and stormwater discharges) and the need to reduce the contaminant discharge loads and address the impacts of residual contaminant discharges.
(c) Climate change impacts on the city's water systems including reduced source security, and increased flood hazard risks, erosion and wastewater network overflows.
(d) Water supply intake, headworks and treatment system capacity.
(e) Wastewater treatment plant and discharge system capacity.
(f) Impacts of intensification on local network capacity performance and the upgrades needed to ensure compliance with technical specifications and design standards (e.g. pipe sizes and methods of network connections). Generally speaking, the proposed NPS-UD density will treble the previously utilised demands in Master Planning for Strategic Infrastructure. These density increases applied to an existing built-up environment trigger a number of design requirements which require upsizing at the local infrastructure level and a step change in trunk and strategic conveyance network investment.
(g) Satisfying the city's obligations under Te Ture Whaimana with respect to network performance.

110. These strategic servicing challenges have not been specifically included in the TLA but are significant and exacerbate the scale and costs of future investments needed to service the growing city and restore and protect the Awa.

111. At a high level, the TLA suggests that the Greenfield parts of the City fare better. This is because growth projections used for previous master

planning and funding recommendations have concentrated growth in these areas and have projected low growth or declining population in brownfield areas. Consequently, previous, and current infrastructure planning and development has focussed investment on the networks needed to service these greenfield areas.

112. Assessing network performance using growth enabled by the current district plan provisions will highlight that the most recent recommended investment programmes are deficient and that significantly more investment is needed across the City.

113. Based on the TLA, it is evident that HCC would need to make a substantial commitment to additional infrastructure planning and investment across the entire network, but particularly within the Stage 1 area, if MDRS densities were enabled in all residential zones without constraint. Increased infill development densities occurring ad hoc, across the residential zones, would place pressure on the already constrained networks, leading to network breaches and failures at the local scale arising from unmanaged cumulative impact.

114. In addition, retrofitting strategic upgrades within the brownfield's environment (such as water reservoirs, bulk wastewater storage facilities, stormwater treatment devices will require suitable sites which may be difficult and costly to secure.

115. Major upgrades to networks in brownfields areas will also be disruptive and will need to be carefully co-ordinated across all waters and other utilities to deliver an efficient upgrade programme.

Effect of intensification where infrastructure capacity constraints exist

116. As stated above, the TLA demonstrates that much of the City does not have adequate infrastructure capacity to support the demand projected for

them under historic low growth projections and current district plan enabled densities. That situation is exacerbated under current growth projections and an unconstrained roll out of MDRS.

117. The adverse environmental effects and risks that arise from allowing growth without adequate infrastructure include:

a) Increased contaminated stormwater run-off impacting on water quality, ecology, public health, cultural activities and the relationship between people and the Awa;

b) Erosion from unmanaged stormwater impacting on water quality, habitat, accessibility, cultural activities, and the relationship between people and the Awa;

c) Increased number, locations, and volume of wastewater overflows impacting on water quality, ecology, public health, cultural activities and the relationship between people and the Awa;

d) Reduced and inadequate water pressure compromising fire-fighting capacity; and

e) Increased risk to people, property, and the environment from flood hazards.

118. Most of these effects represent non-compliances or breaches of regional consents held by HCC, and can be directly or indirectly linked to one or more of the Te Ture Whaimana objectives.

119. Hamilton's historic approach to development planning and response has been to ensure that, in particular, the water and wastewater networks have adequate capacity under certain conditions to manage additional demand. This has been done through planning major investment upgrades, requiring developers to fund upgrades, consuming capacity that would

typically be reserved to provide system resilience (e.g. pipe capacity), or enabling short-term interim solutions where major upgrades are planned and funded (e.g. onsite storage tanks). For stormwater, Hamilton's approach since the early 2000s has been to require on-lot stormwater treatment, and downstream urban waterway restoration. Further works are planned and needed to manage the impacts of increased development on our urban streams.

Why is the infrastructure network in its current state?

120. The TLA results demonstrate that the current networks are unable to meet the needs of cumulative increases in demand arising from infill and do not provide for existing plan-enabled capacity. Further intensification cannot occur without significant investment in the networks.

121. The capacity constraints have occurred as a result of multiple factors, one being the financial limits which HCC is required to operate within, which means HCC must prioritise infrastructure projects, with not all obtaining funding.

122. The impact of these financial limits have been exacerbated by the introduction of the duplex provisions of the Operative District Plan (**ODP**) which came into effect in 2014 and have had a significant impact on infill/intensification across the City, effectively doubling the plan enabled capacity within the City's residential zones and development densities in the city not supported by network design capacities.

123. Subsequent infrastructure planning has been unable to proactively respond to the ad-hoc, market-led approach that delivers duplex development across the City. There is currently no staging or sequencing requirements of duplex development.

124. As a result of the duplex provisions in the ODP, infill development has occurred 'pepper potted' across the residential zones, incrementally and cumulatively generating demand on the existing networks, leading to the constraints identified in the TLA, and the breaches and failures referred to above.

125. Whilst a new network could be designed to support plan-enabled duplex densities they cannot affordably or practically be implemented across the City all at once. Nor would investment in select locations necessarily be prudent. There could be a potentially lengthy time for growth in that location to deliver the intensification to match the infrastructure investment, and it is possible that the design life of the infrastructure would be exceeded well before the actual design capacity was reached, representing a wasted investment.

126. Providing an unconstrained MDRS approach would reinforce this existing disconnect or imbalance between the land uses enabled under the ODP and the infrastructure planning and funding, but with an order of magnitude difference between plan-enabled capacity and the ability to provide adequate infrastructure.

QUALIFYING MATTER – TE TURE WHAIMANA

127. I refer to the evidence of Julian Williams dated 20 December 2022, filed on behalf of HCC. This evidence sets out the origins of Te Ture Whaimana, and its significance within the Waikato planning landscape. It has become a fundamental part of HCC's Three Waters infrastructure planning, with a great deal of strategic effort now directed towards the question of how HCC gives effect to Te Ture Whaimana.

128. Te Ture Whaimana sets a high bar in terms of managing Three Waters-related effects, with HCC required to deliver outcomes which contribute to

the restoration and protection of the River, and its ongoing improvement or betterment.

129. To achieve those outcomes, HCC is focussed on how it can plan, build and operate a Three Waters network that appropriately manages the effects of land uses within the City. HCC attempts to maintain a balance between maintaining and managing the existing networks to an acceptable level; the rate of urban development and the provision of public infrastructure necessary to manage the effects generated by that development. If HCC can get the balance right, it can give effect to Te Ture Whaimana. If the balance is not maintained, network breaches and failures occur, and corresponding breaches of Te Ture Whaimana arise.

130. In an environment where infrastructure capacity and funding are constrained, keeping a level of control on where, and to what extent residential intensification can occur will help achieve that balance. If HCC knows where intensification will occur, it can target its infrastructure programme including investment needed in existing assets accordingly. This targeted and strategic approach to infrastructure planning, in combination with a set of controls over which developments can connect to the City networks and when allows HCC to keep the relationship between land use and public infrastructure in balance.

131. The Housing Amendment Act allows HCC to make the MDRS and Policy 3 requirements less enabling if that is necessary to accommodate a matter required to give effect to Te Ture Whaimana.

132. HCC does not have the financial capability to implement an infrastructure investment programme which upgrades and improve its existing networks to the point where they each have the capacity to manage all of the additional demand likely to arise from the widespread roll out of MDRS.

133. Without this investment, an imbalance between enabled residential densities and public infrastructure will arise, and inevitably lead to

breaches of the networks, of the related consent conditions, and ultimately Te Ture Whaimana. The water allocation and supply may become inadequate to meet demand or ensure that fire fighting standards are met.

134. Resolving the imbalance can only occur through modification of the MDRS and Policy 3 enabled densities, reducing and confining the extent and areas of increased densities, and then prioritising the limited infrastructure programme funding HCC has to those areas along with those existing areas with unacceptable levels of service. In combination, HCC also proposes to implement a more robust connections regime, to ensure that development only connects to the networks where capacity exists.

THREE WATERS CONNECTIONS POLICY

135. Maintaining the balance between enabled development and public infrastructure requires a control over connections. Infrastructure is not always available when and where it is needed. A mechanism is required to deal with the situation where development occurs ahead of network capacity being available.

136. HCC has a Three Waters Connection Policy (**Connections Policy**) supported by a suite of bylaws that deal with Three Waters[3] that, among other matters, seek to protect the functioning of the Three Waters networks. The bylaws allow HCC to refuse connections to its networks under specified circumstances.

137. To date, the manner in which the current policy and bylaws are being implemented simply prioritises users and their demands with little, if any, actual assessment as to whether there is adequate infrastructure capacity available in the networks to meet that additional demand. Effectively, approval for connections to the network are a fait accompli for many activities.

[3] Tradewaste and Wastewater Bylaw 2016; Water Supply Bylaw 2013; Stormwater Bylaw 2021.

138. The connections approach is being reviewed, with the intent that a new approvals regime will be in place prior to the substantive hearings on PC12. The reviewed approach is intended to establish a fair, transparent, efficient and robust process for considering development proposals to determine whether there is sufficient available capacity in the network to allow a connection.

139. This approach is expected to involve tiers of assessment relevant to the type, scale and location of the proposed development, the capability of the network to cater for the increased demand (including consideration of funded or planned network improvements) without compromising the network – using critical determining factors / criteria, the potential for the applicant to resolve infrastructure capacity issues (e.g. through Private Development Agreements), and whether the location is being promoted in PC12 to realise land use based benefits for which infrastructure investment is assumed to be prioritised.

140. It is likely that implementing the new connections approach will result in development demand in parts of the City not being granted connections approval until such time as infrastructure planning and investment delivers additional capacity. In controlling connections in this manner, HCC will maintain the necessary balance between land use and infrastructure that is so critical to delivering on the Te Ture Whaimana objectives.

141. This provides a critical backup to RMA plans for managing the effects of development where inadequate system capacity exists but is intended to operate to support those RMA plans rather than replace them.

IMPLICATIONS OF THREE WATERS REFORM

142. Finally, in terms of completing the overview of the HCC Three Waters infrastructure position, a number of points relating to Central Governments' Three Waters reform is necessary.

143. The reforms will significantly alter roles and responsibilities for the design, planning, investment and operation of the current and future Three Waters networks. As a result of the Three Waters legislation, the Three Waters tools, such as the Connections Policy, the Three Waters bylaws[4], infrastructure master plans, LTPs and infrastructure strategies, will no longer be required by HCC as Three Waters will cease to be its responsibility. As it stands, decision-making on Three Waters-related matters currently sits with the Department of Internal Affairs until the new water entities are established and operational.

144. For now, HCC must assume that the statutory drivers and obligations (e.g. giving effect to Te Ture Whaimana) that underpin HCC's approach to connections will be carried through into the drivers and obligations of the new Three Waters entity that has responsibility for Hamilton City and that suitable powers and tools will be provided to the entity to deliver on those roles and responsibilities.

145. Accordingly, regardless of which entity is responsible for the infrastructure, the same 'matters' required to give effect to Te Ture Whaimana must be accommodated.

CONCLUSION

146. Hamilton City's existing Three Waters systems were designed and constructed to service densities and provide levels of service considered appropriate at the time they were developed. These systems have not been designed to service current plan enabled development densities or those anticipated through the NPS-UD and MDRS.

[4] Tradewaste and Wastewater Bylaw 2016; Water Supply Bylaw 2013; Stormwater Bylaw 2021.

147. Today's environmental, social, cultural expectations and regulatory obligations require levels of service and performance that are significantly higher than delivered historically.

148. Te Ture Whaimana sets out obligations to deliver 'betterment' to the Waikato River, and not simply to avoid, remedy or mitigate environmental effects. 'Betterment' could relate to environmental health (e.g. water quality, ecological), social outcomes (e.g. the communities' relationship and interaction with the River and catchment), cultural outcomes (e.g. strengthening of whakapapa with the Awa (including the catchment and metaphysical being); the ability to exercise mana whakahaere including the conducting of customary activities and having decision making authority around the management of the Awa).

149. HCC's existing Three Waters systems have challenges with respect to meeting regulatory requirements and relevant obligations under Te Ture Whaimana to varying degrees across the City already.

150. These challenges will be exacerbated by continued infill development currently enabled by HCC's existing duplexing policies, and further compounded by the development densities contemplated by the NPS-UD and MDRS, particularly if that intensification is not directed to identified growth areas where infrastructure spend is targeted.

151. Even with that more targeted approach to densities, a step change in investment from that previously identified is required. HCC must provide the necessary infrastructure capacity and performance needed to respond to the densities contemplated by the NPS-UD and MDRS, while ensuring it contributes toward restoring the health and wellbeing of the Waikato River in its fullest sense as required by Te Ture Whaimana.

152. The TLA and Master Plan work highlights that to enable the intensification contemplated without significant investment would result in worsening the effects on the Waikato River and its tributaries which will create conflict with Te Ture Whaimana.

153. The detailed costs to upgrade the networks, treatment plants and headworks to provide for NPS-UD and MDRS across the city have not been quantified at this stage. It is clear however that the cost and practical challenges with doing so across the city, all at once will be prohibitive. There is a significant infrastructure investment deficit already from that recommended to respond to the 2017 population projections and what has been funded in the 2021-2031 LTP.

154. The TLA highlights that the costs to provide infrastructure necessary to respond to MDRS everywhere all at once is prohibitive and confirms the need to prioritise where MDRS and higher-density residential development is enabled.

155. Adopting MDRS as per the Housing Amendment Act without a clear and committed infrastructure investment and delivery programme will increase network failures and adversely affect the Awa and communities. Accordingly, a targeted approach to increased densities is required to ensure that the necessary investment needed to service the increased densities is in place at the right time.

156. Prioritising specific areas of the city for high density development would provide the ability to prioritise infrastructure investment in strategic locations, contribute toward Te Ture Whaimana, and provide for growth.

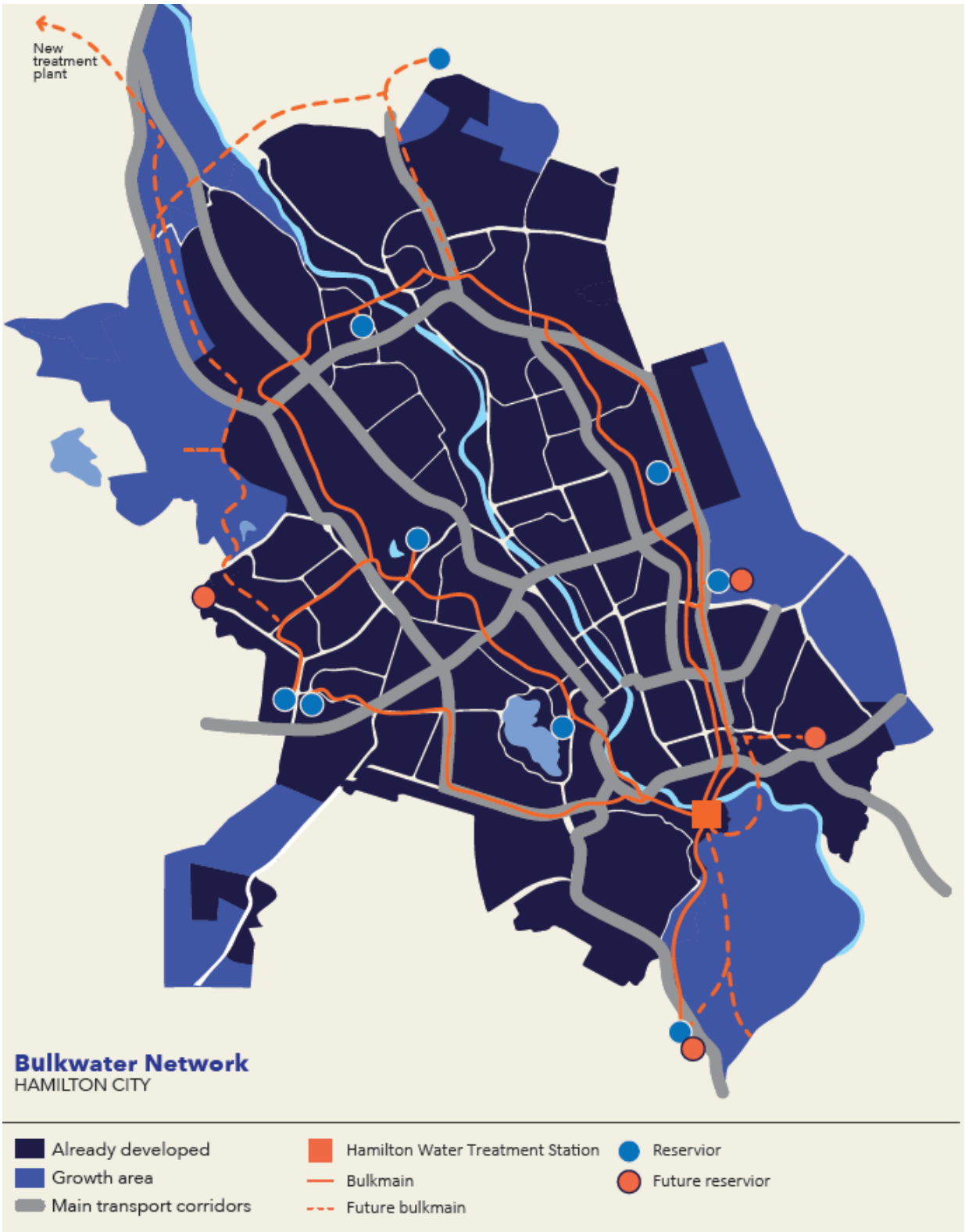
Jacqueline Maree Colliar

Dated 20 December 2022

APPENDIX 1

Outline of Hamilton's strategic three waters networks

Bulkwater (Potable) network



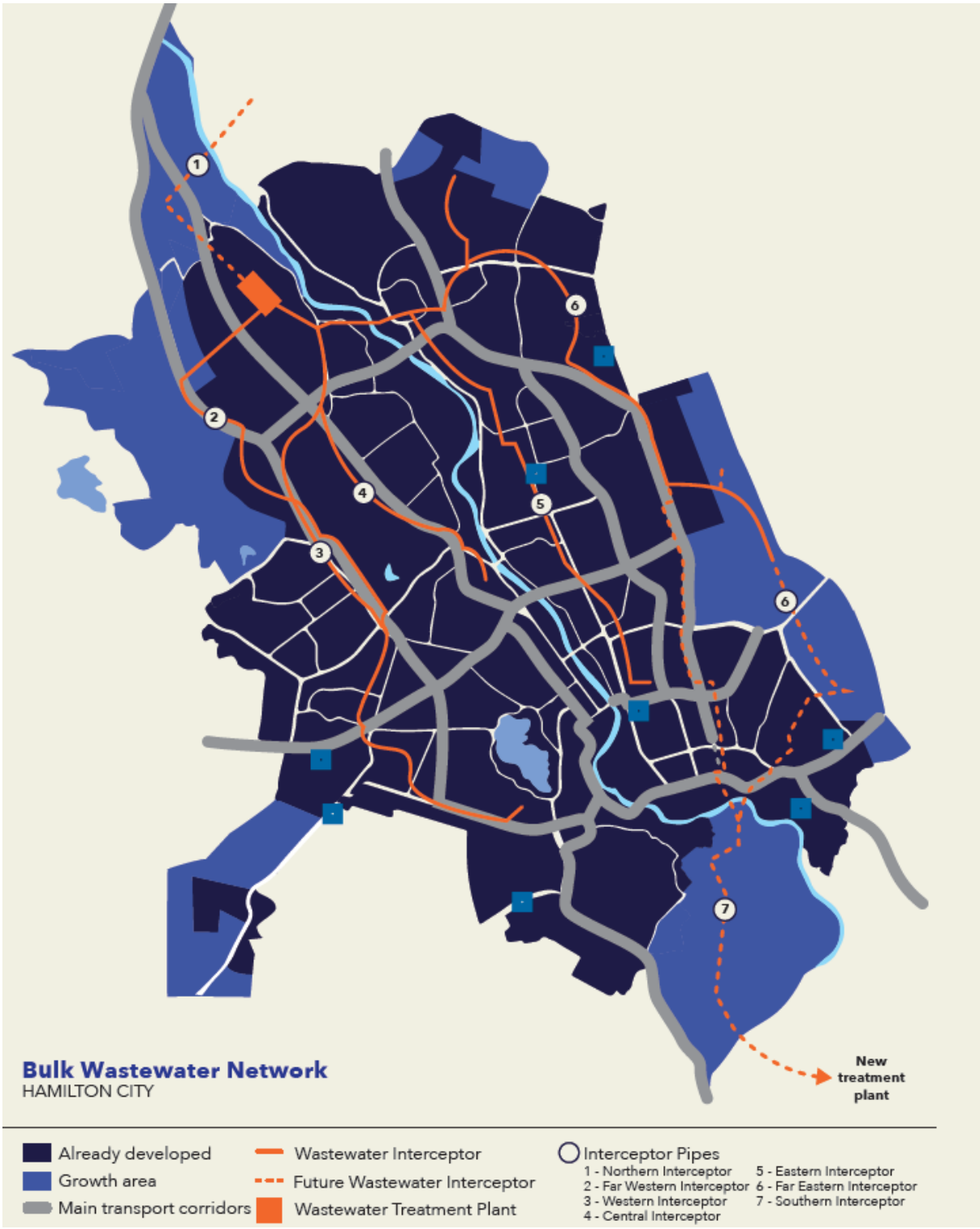
Source: Hamilton City Council 2021-2051 Infrastructure Strategy

Bulkwater (Potable) network cont…

Asset group	Asset type	Purpose and description	Quantity
Water treatment	Civil, structural, mechanical, electrical and automation	Treatment plant that treats river water for human use.	1
Storage	Reservoirs	Used to store treated water. To meet drinking water standards, we must be able to store enough water to meet 24 hours of average water demand.	9 operational
Network	Service connections	Pipe that connects the private water pipe within a property to the water network.	54,259
	Bulk watermains	Bulk watermains carry treated water from the treatment plant to the reservoirs.	1,251 km
	Reticulation pipes	Pipes of decreasing sizes that carry treated water from treatment plant or reservoirs to properties.	
	Valves	Devices to control the flow of water from one pipe to the next.	11,412
	Hydrants	Above-ground connection that provides access to a water supply for the purpose of fighting fires or for flushing.	6,891
	Meters	Measure water use for our commercials and industrial customers and bulk water flows within the network.	3,875
	Backflow Preventers	These devices prevent water from private pipes re-entering into the water network.	286
	Bulkmain Chambers	These are miscellaneous assets grouped together consisting of manholes and chambers that house various valves.	48

Asset group	Useful life (years)
Bulkmain chambers	100
Backflow devices	40
Meters	15
Hydrants	
Pre-1996	50
1996 or later	75
Aerial mains	
Exposed or Aerial Pipes	50
Ducted Pipes	100
Pipes	
Asbestos Cement	60 – 80
ALK	50
PVC – Rider Mains*	45 – 100
PVC - Other	100
PE, Cast and Ductile Iron Concrete Lined, Stainless Steel, MS	100
Case Iron	60
Copper	40
Ductile Iron	90
Valves	40-75
Reservoirs	
Tanks	80
Building	15 – 100
Pipework	15 – 60
Electrical and Mechanical	15 – 30
Treatment Plant	
Civil – Tanks, Building, Pipework, Metalwork	16-100
Electrical Services	5 – 40
Instrumentation	10 - 30
Mechanical Services	5 – 50
Pumps and Motors	40
Cathodic Protection Device	15-100

Wastewater network



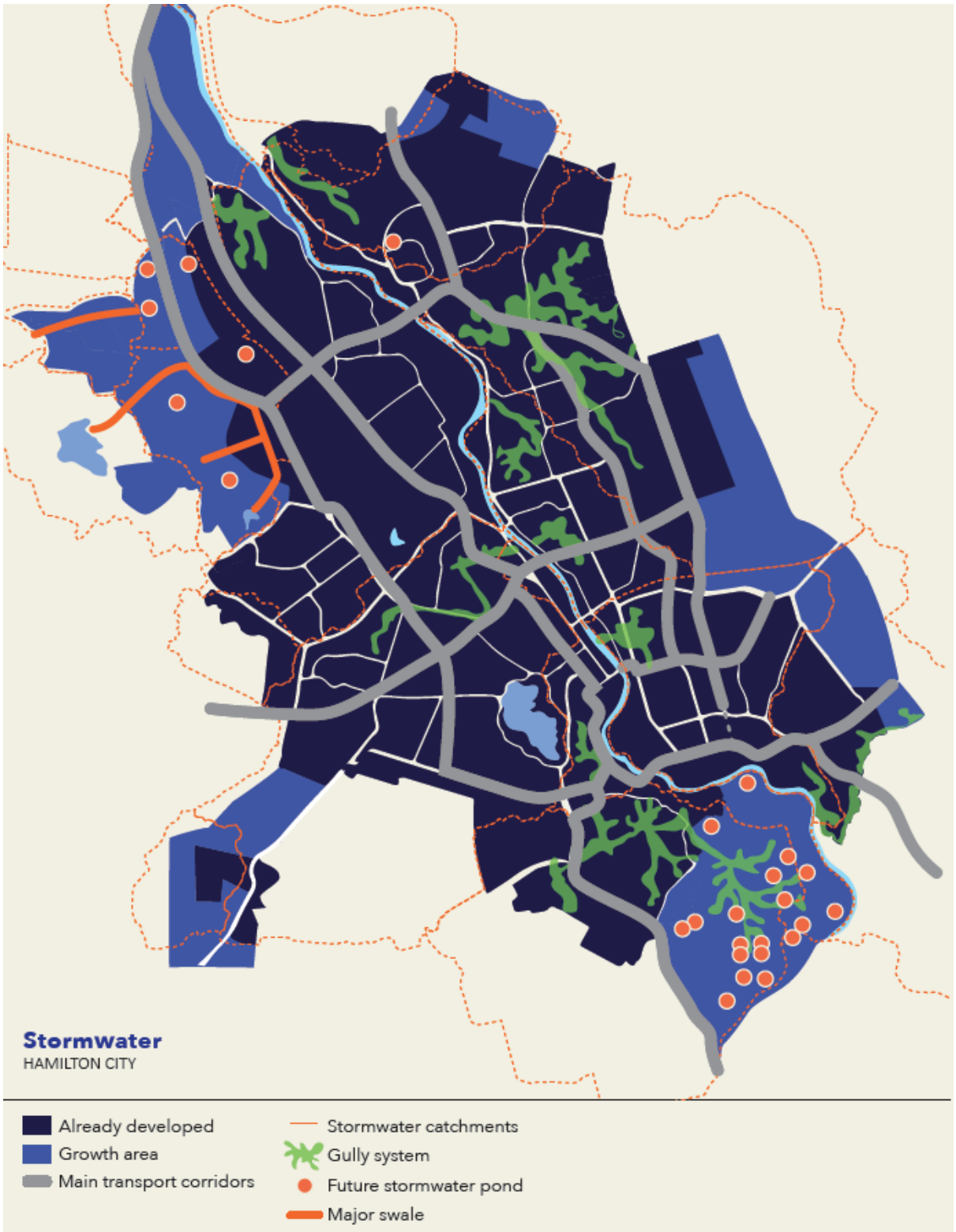
Source: Hamilton City Council 2021-2051 Infrastructure Strategy

Wastewater network cont…

Asset group	Purpose and description	Quantity
Service connections	A pipe that connects the private sewer within a property to the wastewater network.	58,820 connections
Interceptor pipes	Large diameter pipes (typically larger than 525mm diameter) that provides conveyance from each area of the City to the treatment plant.	849 km
Pipes	Once the wastewater leaves a property it travels in pipes to the interceptors. There are a number of different types of pipes within our network including: • gravity pipes • rising mains • interceptors • bridges.	
Manholes	Service opening which allows access for inspection, cleaning or maintenance of the public wastewater network.	16,597
Pump stations	Pump stations are installed at low points in the network so that wastewater flowing from these areas can be lifted to a higher point and continue its journey to the treatment plant under gravity.	128
Treatment plant	The treatment plant converts wastewater and trade waste into a disposable effluent and solids.	1

Asset group	Useful life (years)
Aerial pipes	
Exposed	50
Ducted	100
Pipes (Rising Mains)	
Asbestos Cement (AC)	40
Pipes (Gravity)	
Asbestos Cement (AC)	60 - 80
Earthenware, PVC, PE, MDPE, SSCL	100
Earthenware cured in place	50
HDPE	50 - 100
Reinforced Concrete, Stainless Steel Cement Lined	75
Stainless Steel	30
Lined >=375mm	75
Manholes	100
Valves	40 - 75
Pump station	
Electrical Cabinet and Level Control	15
Wetwell	75
Storage and Valve Chambers	100
Lids, Valves and Pipework	40
Pumps	20
Electrical	75-100
Treatment Plant	
Civil - Tanks, Building, Pipework, Metalwork	16-100
Electrical Services	5-40
Instrumentation	10-30
Mechanical Services	5-45
Pumps and Motors	40

Stormwater network



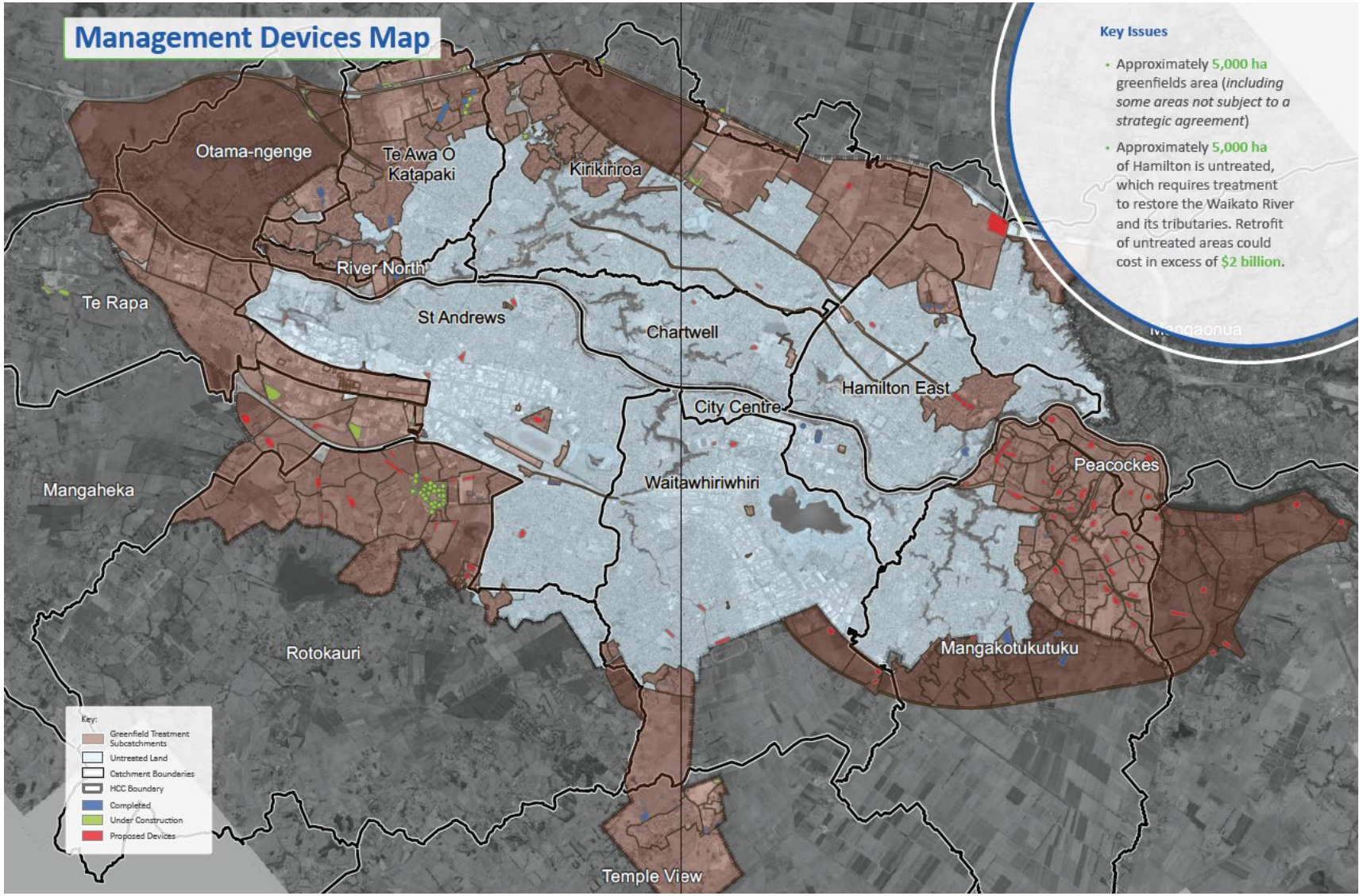
Source: Hamilton City Council 2021-2051 Infrastructure Strategy

Stormwater network cont…

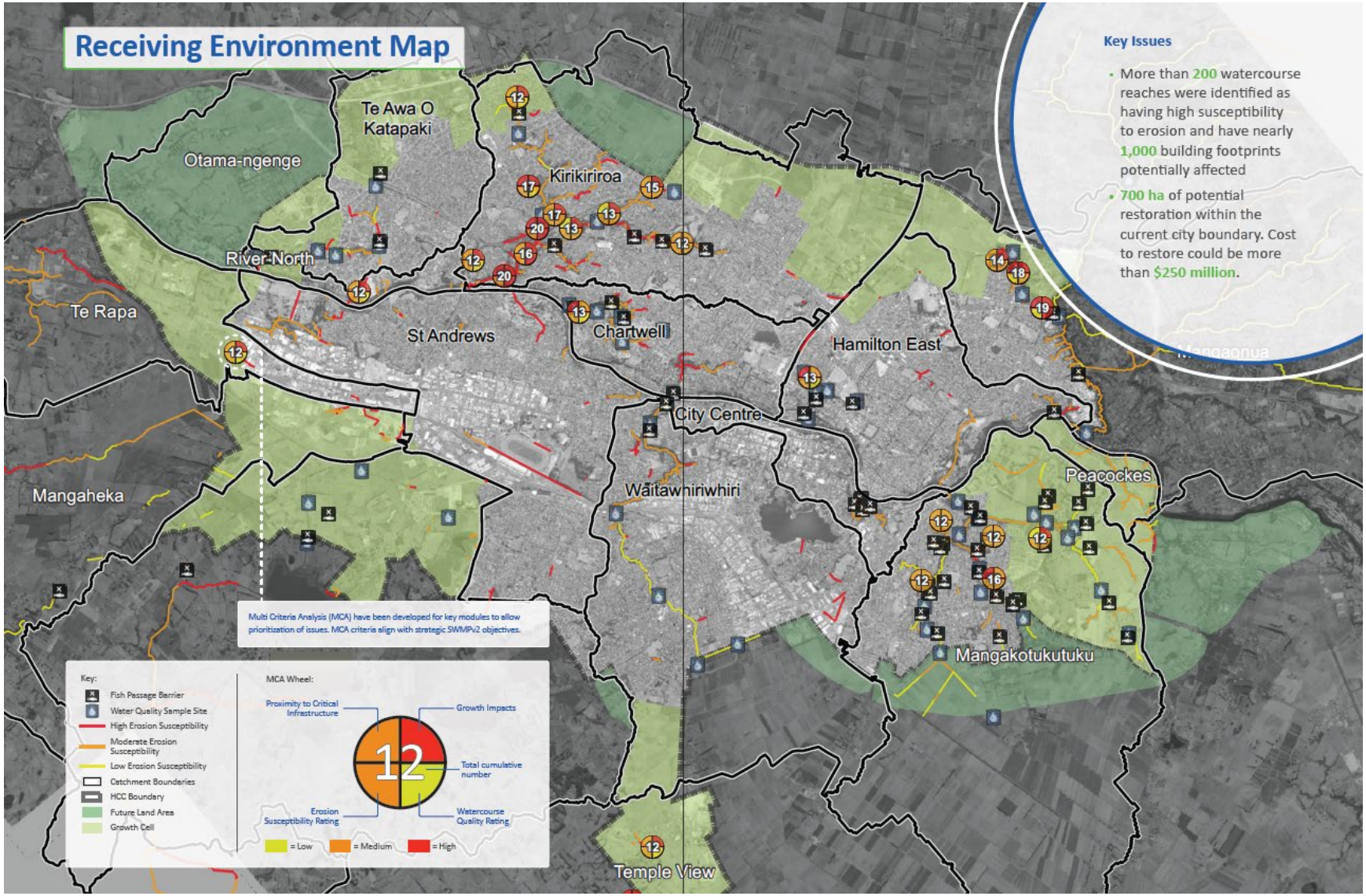
Asset group	Asset type	Purpose and description	Quantity
Network	Service connections	A pipe that connects the private stormwater pipe within a premise to the stormwater network.	50,125
	Reticulation pipes	Once stormwater leaves a property it can travel in pipes to an open watercourse	688km
	Manholes	Service opening which allows assess for inspection, cleaning or maintenance of the public stormwater piped network	13,946
Treatment	Treatment/ detention/ flood management	Ponds, wetlands and bunded areas that treat stormwater and or detain stormwater during high rainfall events to protect downstream properties from flooding	35
Assets within streams and rivers	Lined open watercourses	Drains and streams that transport water to other streams or the Waikato River	105km
	Outlets and Inlets	Located at the end of the pipe, outlets and inlets prevent erosion and scouring of the open watercourse to which stormwater is discharged	277
	Other	We have a number of other devices within the network including soakage trenches, soakage pits, fish passage devices, and erosion control devices	

Asset group	Useful life (years)
Channels	90
Inlets and outlets	100
Pipes (Gravity)	
Asbestos Cement	60 – 80
Earthenware, PVC, PE	100
Earthenware cured in place, ALK	50
HDPE	50 – 100
Reinforced Concrete	80 – 100
Reinforced Concrete lined	75 - 100
Stainless Steel	40
Stainless Steel Cement Lined, ALU	80
Nova	30
GALV	70
Manholes	100
Soakage Trench	50
Erosion Control	100

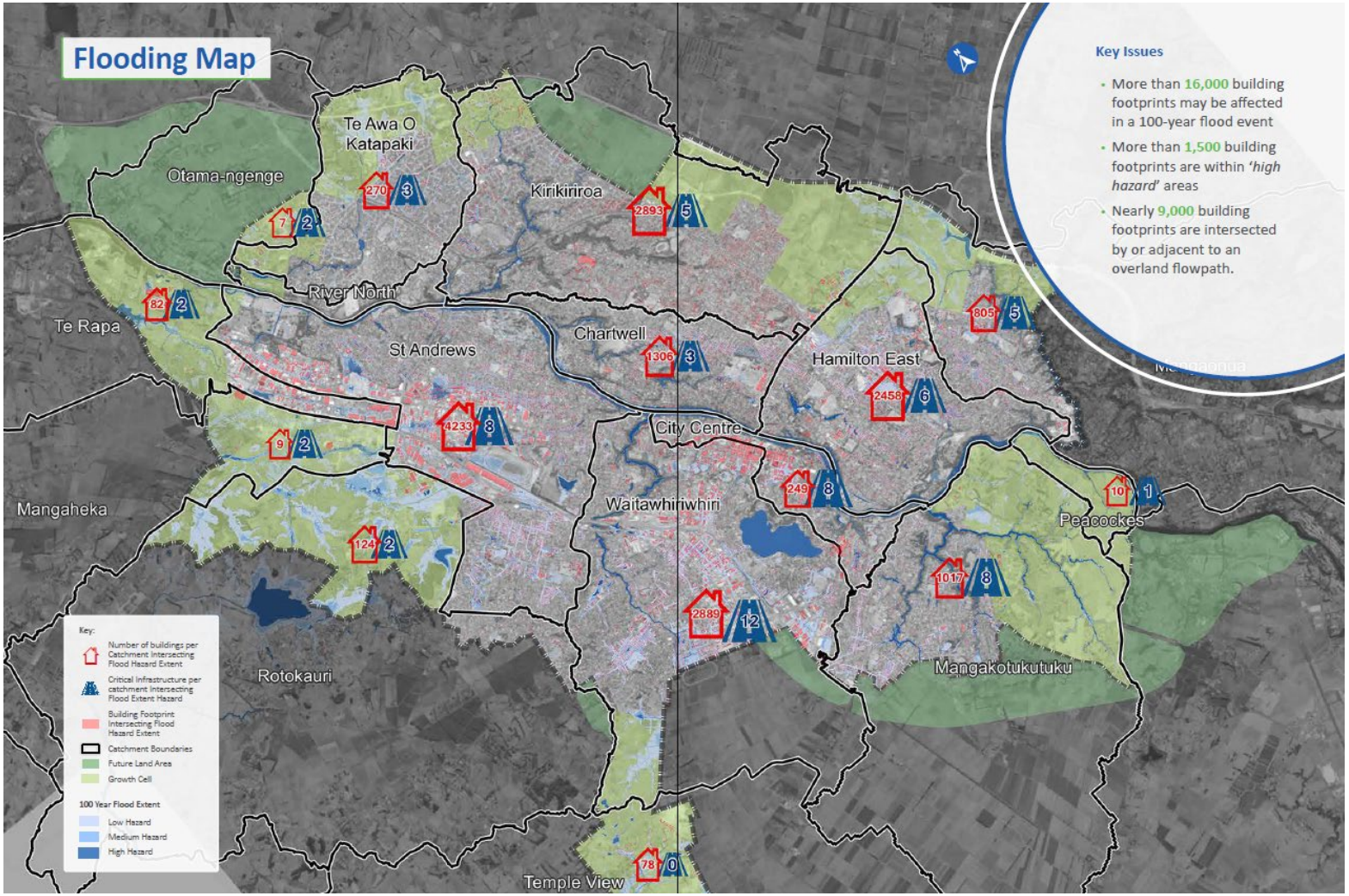
Stormwater network cont…



Stormwater network cont…



Stormwater network cont…



Source: HCC Stormwater Master Plan V2 (Summary Brochure images), 2020

APPENDIX 2

Spatial development of Hamilton City over time (simplified)