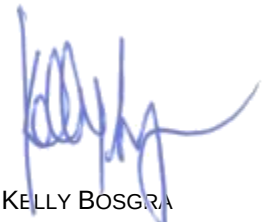
WASTEWATER AND WATER SUPPLY REPORT

On behalf of:

GOLDING ROAD PLAN CHANGE

Golding, Station & Yates Roads
Pukekohe

31 MAY 2021
BSL REF: 4294
REVISION C

REPORT PREPARED BY	REPORT REVIEWED BY	REPORT AUTHORISED BY
		
KELLY BOSGRA REGISTERED PROFESSIONAL SURVEYOR	SKYWARD (BOTIAN) HANG CIVIL ENGINEER	SIR WILLIAM BIRCH DATE: 31 MAY 2021

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CONTENTS

APPENDICES

1 INTRODUCTION

1.1 PROJECT

The report comprises a Wastewater and Water Supply Assessment in support of the Golding Road Plan Change.

1.2 LEGAL DESCRIPTION

The site is approximately 83ha of land located in south-eastern Pukekohe comprised in 14 separate properties owned by nine different registered owners, and schedule of these properties is contained within Appendix E.

1.3 SITE DESCRIPTION

The boundaries of the site are well-defined by Golding Road, Station Road, Royal Doulton Drive, part of Yates Road and a stream which traverses from Golding Road to Yates Road.

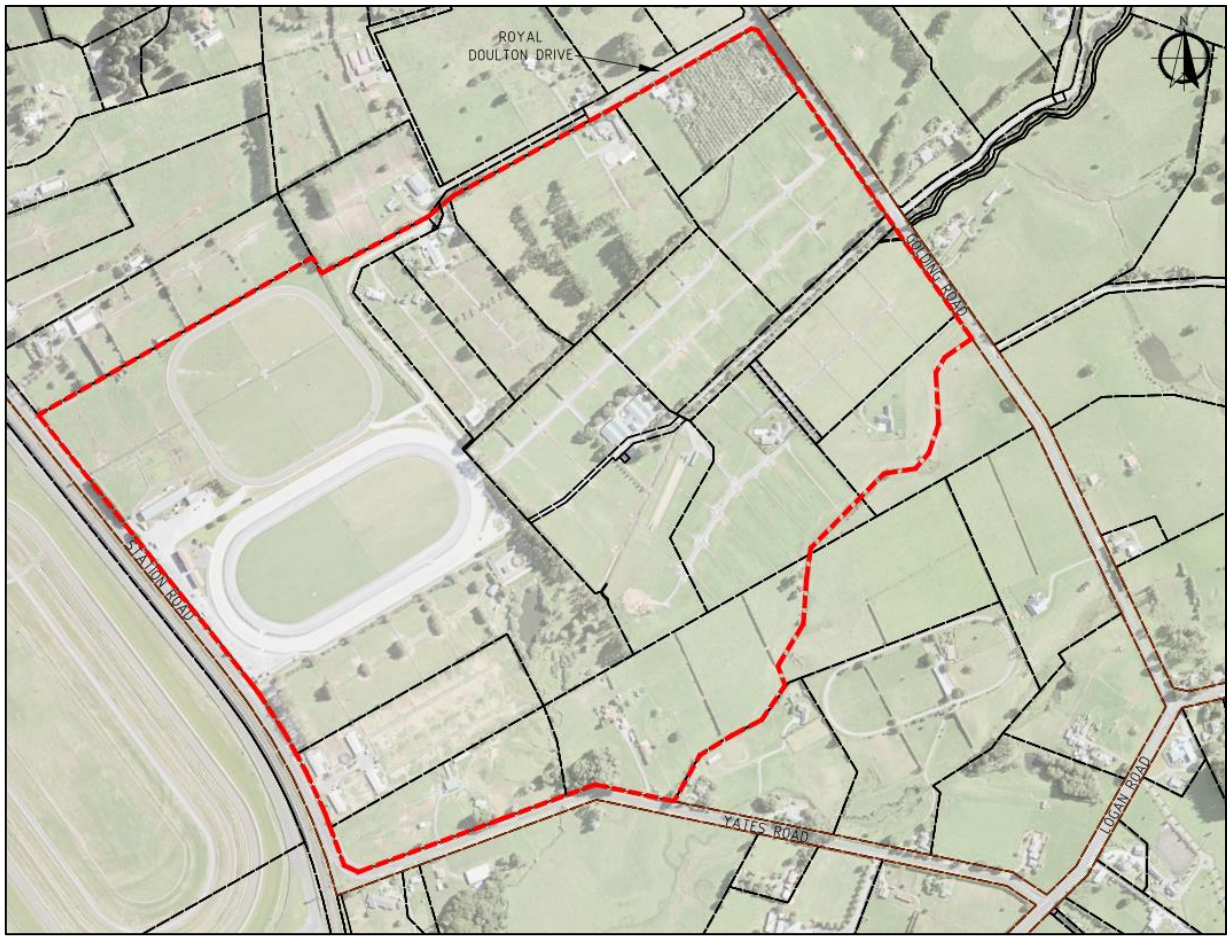


Figure 1: The plan change site in red. (Source: Birch Surveyors)

This is a flat to semi flat site , gently north-east to south-west, and also towards the streams.

2 WASTEWATER RETICULATION

2.1 EXISTING NETWORK

The existing wastewater reticulation network servicing the Pukekohe area is predominantly a series of gravity flow piped systems which carry wastewater to three pump stations within the area, as represented in Figure 2 below.

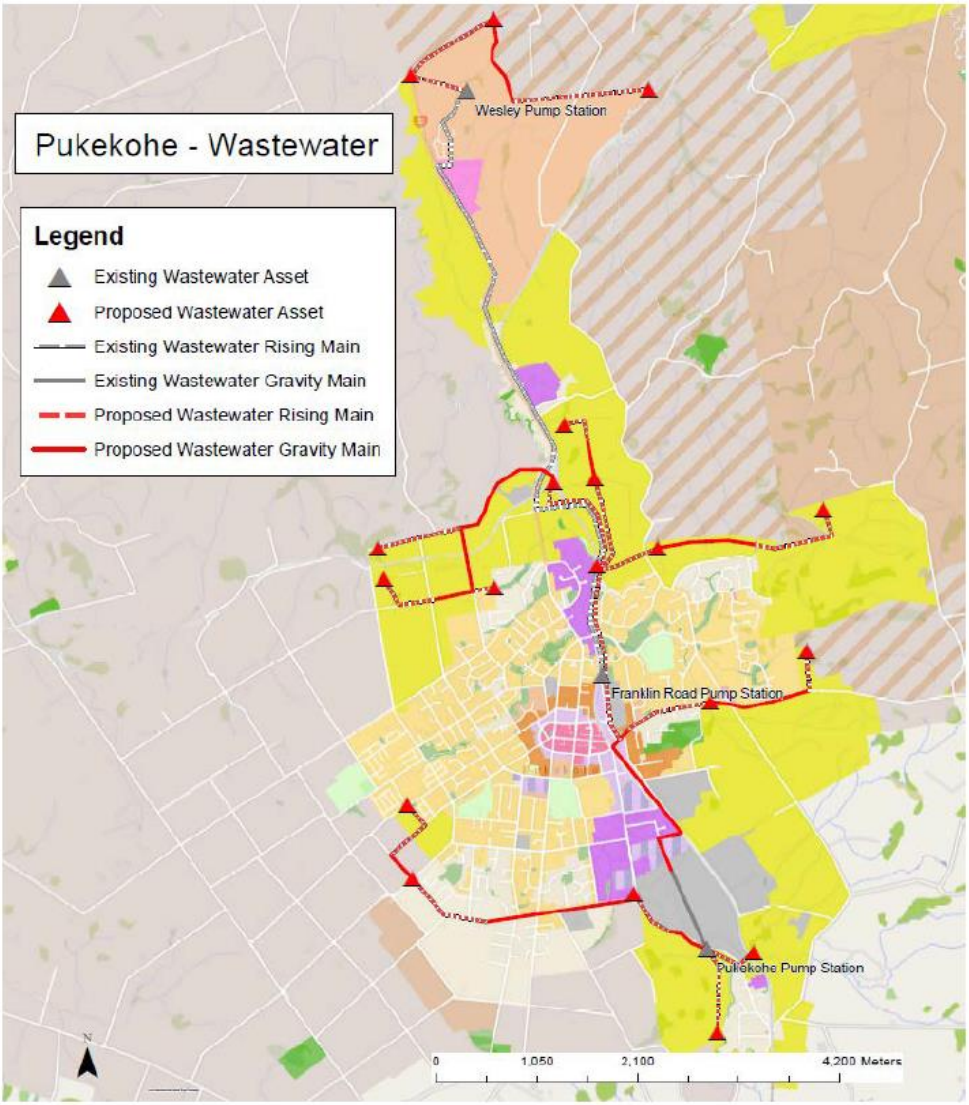


Figure 2: Indicative Pukekohe/Paerata Servicing Plan

Sewage collected via the Wesley Pump Station and Franklin stations are transferred to the Pukekohe Transmission Pump station, which is then conveyed via a 7km trunk main to the Pukekohe wastewater Treatment Plant located on Parker Lane where it is treated and ultimately discharges into the Waikato river.

2.2 EXISTING WASTEWATER NETWORK CAPACITY ASSESSMENT.

A Technical report prepared by Watercare, was submitted to council for the Pukekohe/Paerata Structure plan and included in Appendix C. Within the report Watercare has undertaken a wastewater network capacity assessment of Pukekohe's existing infrastructure and state that the

recently constructed Pukekohe Pump station can accommodate the ultimate future wet weather flows from Pukekohe/Paerata structure plan, which includes the area associated with this Private Plan Change.

2.3 PROPOSED DEVELOPMENT.

The Private Plan Change for the proposed development relates to an 83.8243ha area currently zoned a mix of future urban and major recreation facility, under the operative Auckland Unitary Plan. The proposed development would involve changes to the current zoning to create both Residential and light industrial areas. Indicative layout and connectivity plans showing the proposed zones are included in Appendix A.

A network capacity assessment was undertaken for the proposed development, with the calculations included in Appendix B. and has been assessed in accordance with the Watercare Code of Practice for Land Development. The proposed Average Daily Weather Flow (ADWF), Peak Dry Weather Flows (PDWF) and Peak Wet Weather Flows (PWWF) calculation, have been tailored to accommodate for both the parameters and areas represented in Tables 3, 4 and 5 below.

Residential property type	***Design wastewater flow allowance***	***Design wastewater peaking factors***	
	Litres per person per day (L/p/d)	***Peaking factor: Self-Cleansing Design Flow*** *(Normal PDWF)*	***Peaking factor: Peak Design Flow*** *(PWWF or Exceptional PDWF)*
Up to three storey residential development	*180*	*3.0*	*6.7*
High-rise residential (or mixed-use) buildings four storeys and above	*180*	*3.0*	*5.0*

Table 3: Design residential wastewater flow allowance and peaking factors (Source: Watercare COP)

Dry industry activity type	Routine Peak Daily Discharge Litres per square metre per day ($L/m^2/d$) (See Note 5)	Design wastewater peaking factors	
		Peaking factor: Self-Cleansing Design Flow (Normal PDWF)	Peaking factor: Peak Design Flow (PWWF or Exceptional PDWF) (See Note 6)
Light water users, or up to 2 storeys (Note 1)	4.5	5.0 x (Routine Instantaneous Peak Discharge)	6.7 x (Routine Peak Daily Discharge)
Medium water users, or 2 to 5 storeys (Note 2)	6.0		
Heavy water users, or 5 to 10 storeys (Note 3)	11.0		
Very heavy water users (Note 4)	> 11.0 Specific design required	Specific design required	Specific design required
Unknown and site area >10ha, <100ha	1 L/s/ha (complete land area)	2.0	6.7
Site area >100ha	Refer to transmission design standards	-	-

Table 4: Design dry Industry wastewater flow allowance and peaking factors (Source: Watercare COP)

PLAN CHANGE ZONE	AREA (ha)
Mixed Housing Urban (Plan Change)	40.0000
Light Industrial (Plan Change)	15.9000
Mixed Housing Urban (Upstream Catchment)	12.3000
Total	**68.2000**

Table 5: Proposed Plan Change wastewater catchment zone areas

The estimated ADWF, PDWF and PWWF for the plan change area is summarised in Table 6 and calculations have been included within Appendix B.

Flow Type	ADWF (l/s)	PDWF (l/s)	PWWF (l/s)
Residential (Plan Change area)	5.3	15.8	35.2
Light Industrial (Plan Change area)	8.3	41.4	55.5
Future Residential (Upstream catchment)	1.3	4.0	9.0
Ultimate Development Flows	14.9	61.2	99.7

Table 6: Estimated Wastewater Flows

2.4 WASTEWATER RETICULATION OPTIONS

Based on our analysis of Pukekohe's existing wastewater infrastructure and the scope of the proposed plan change area, the following wastewater reticulation options have been identified in the sections below. These options are to be read in conjunction with the indicative wastewater reticulation plans included within Appendix A.

2.4.1 GRAVITY NETWORK TO EXISTING INFRASTRUCTURE

A new gravity network could service the Plan Change area. This can be accomplished by designing and constructing a traditional underground piped network from an appropriate point on the existing infrastructure. This option would be the most preferable as it provide a superior network with lower maintenance costs.

2.4.2 GRAVITY AND PUMP TO EXISTING INFRASTRUCTURE

A new gravity network could service the Plan Change area and discharge to a new on-site Wastewater Pump Station, pumping waste to the existing infrastructure. This option is the least preferable, as it has higher initial costs for the pump station, higher running and maintenance costs and does not fit with any planned infrastructure extensions and investments.

2.5 WASTEWATER CONNECTION POINT

Further to the preferred scenario, this Plan Change can connect to Pukekohe's existing wastewater infrastructure via a gravity line to Wastewater Manhole (WWMH) (GIS ID 423414), as shown:

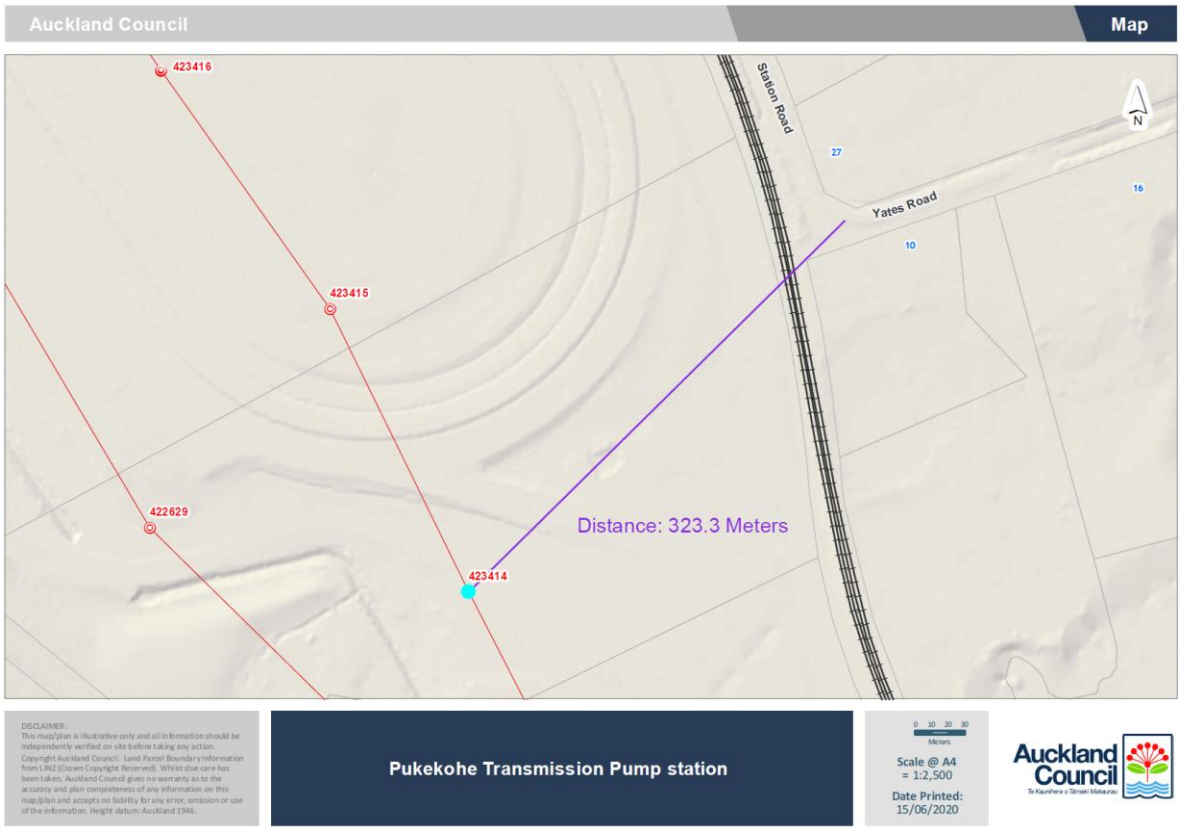
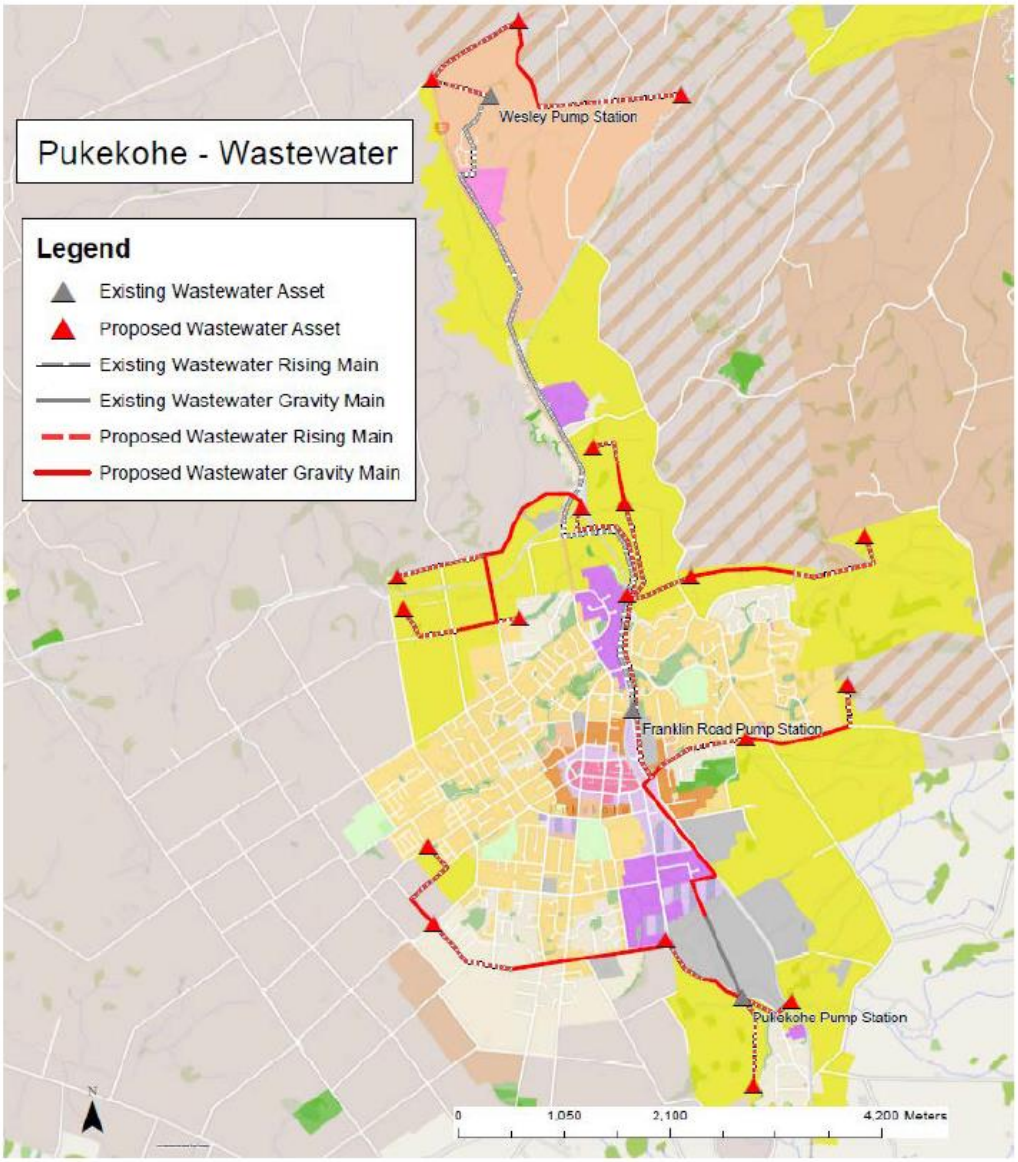


Figure 7: Wastewater connection manhole

This is within the Pukekohe Park Raceway and immediately upstream of the Pukekohe Transmission Pump Station.

2.5.1 The Pukekohe Transmission Pump station

As per the findings of the Technical Report, prepared by Watercare (Appendix C), the Pukekohe Transmission Pump station, is located at 360 Buckland Road, which is located approximately 500m to the south west of the proposed development. This has been designed and built to accommodate the ultimate future wet weather flows from the Future Urban Zone, including the Pukekohe/Paerata structure plan within which the Plan Change is located.



2.5.2 Pump Station Pukekohe/Paerata Structure Plan

Under the Pukekohe/Paerata Structure plan, Watercare has proposed a new pump station east of the railway and south of the proposal, to service all of the land east of railway, from Golding Road to Logan Road. The indicative location is represented in Figure 8. While the date of design or construction is yet to be confirmed, the pump-station is located downstream of the proposed development and could provide a future permanent or alternative connection point. This means the development can make a temporary connection under the railway as proposed, but once the new Pump Station is constructed, the connection under the railway can be made redundant with the wastewater flows directed to the proposed pump station as indicated.

Figure 8 Pukekohe Paerata Structure Plan Wastewater Assets (Source Structure Plan)

We note that this pump station is needed for the development of land South of Yates Road, however it is not necessary for the proposed Plan Change Area as a gravity line to the existing infrastructure can be made. We also note that the proposed pump station is located in a Flood Plain, within private property outside this plan change and a considerable distance from any existing access. These all conspire against making this a practical or economic connection option, especially as an economic and viable gravity option is available for the Plan Change.

2.6 WASTEWATER RETICULATION PLAN

Based on the options identified and currently available, a gravity network to pump station to service the proposed plan change would be preferable method.

The new residential and light industrial lots within the development would be serviced by a local gravity reticulation system flowing to the Pukekohe Transmission pump station. Then once the Pump Stations from the Pukekohe/Paerata Structure Plan have been completed and are operational, there is potential for alternative connection points to be made which would alleviate wastewater flows from the Pukekohe pump station should the event arise.

Concept Wastewater reticulations Plan have been drafted and included in Appendix A of this Report. The design has been detailed below and should be read together with the Wastewater reticulation plans.

2.6.1 LAYOUT

An indicative layout for the wastewater reticulation is shown in Figure 9 and included in Appendix A

Figure 9 - Indicative Plan Change Wastewater Layout

The final layout and pipe sizes will be confirmed upon future subdivision and will be completed in compliance with the Watercare Code of Practice for Land Development. All new pipelines pipes collecting and conveying wastewater flows will need to consider the upstream and downstream catchments and be sized accordingly to meet the anticipated development yield.

As represented in Figure 9, the areas represented by pink shading identify areas that require recontouring to achieve required clearances. These areas are minor in nature and show that the Plan Change are can be adequately serviced with a gravity wastewater system. Earthworks are an expected part of development, and the future design will ensure compliance with WaterCare Development Standards.

The wastewater connection to the existing infrastructure is proposed to terminate at the Pukekohe pump station, located at 360 Buckland Road, via existing WWMH (GIS ID 423414). This is shown by the long section plan included in Appendix B. The line connecting the Plan Change to the existing Manhole is proposed to be a 375mm Pipe at a grade of 1:200. The flow calculations anticipate that this pipe will flow at 80% capacity during PWWF of 100 l/s.

2.6.2 Current Ownership Land

Where the proposed wastewater reticulation layout crosses adjoining properties, neighbour approval forms will be required to be obtained. This includes KiwiRail and Pukekohe Park. We do not anticipate an issue with KiwiRail, and have undertaken preliminary discussions with Pukekohe Park and have positive responses from them regarding the proposed connection.

2.7 Summary

In summary,

The plan change area can be serviced by a gravity wastewater system.

The PWWF flow for the plan change area and upper catchment area is 105l/s.

The design can meet the standards required by Watercare's Code of Practice for Land Development.

The existing Pukekohe Transmission Pump Station can accommodate the additional flows created by this Plan Change.

We believe any adverse effect resulting from the plan change will be no more than minor.

2.8 Funding Proposal

The extension of new wastewater infrastructure for the proposed development will be funded by the developer and the new infrastructure and assets will be vested to Auckland Council.

3 WATER SUPPLY RETICULATION

3.1 EXISTING WATER SUPPLY NETWORK

The current Water Supply system involves pumping Treated Water from the Waikato 1 Watermain to a number of Water Reservoirs in Pukekohe, these include Kitchener Road, Anzac Ave and Rooseville Park, the latter being being the closest reservoir or bulk supply. Rooseville Park has a supply elevation of RL 106m (Watercare), and with the other reservoirs, delivers water to Pukekohe Area.

The Plan Change Area is currently connected to the Pukekohe Water Mains by a low pressure 40mm trickle feed. Each property has their own Water Tank capturing roof runoff, and where connected, are being topped up from the trickle feed. This low pressure reticulation does not supply water for fire fighting purposes nor for direct connection.

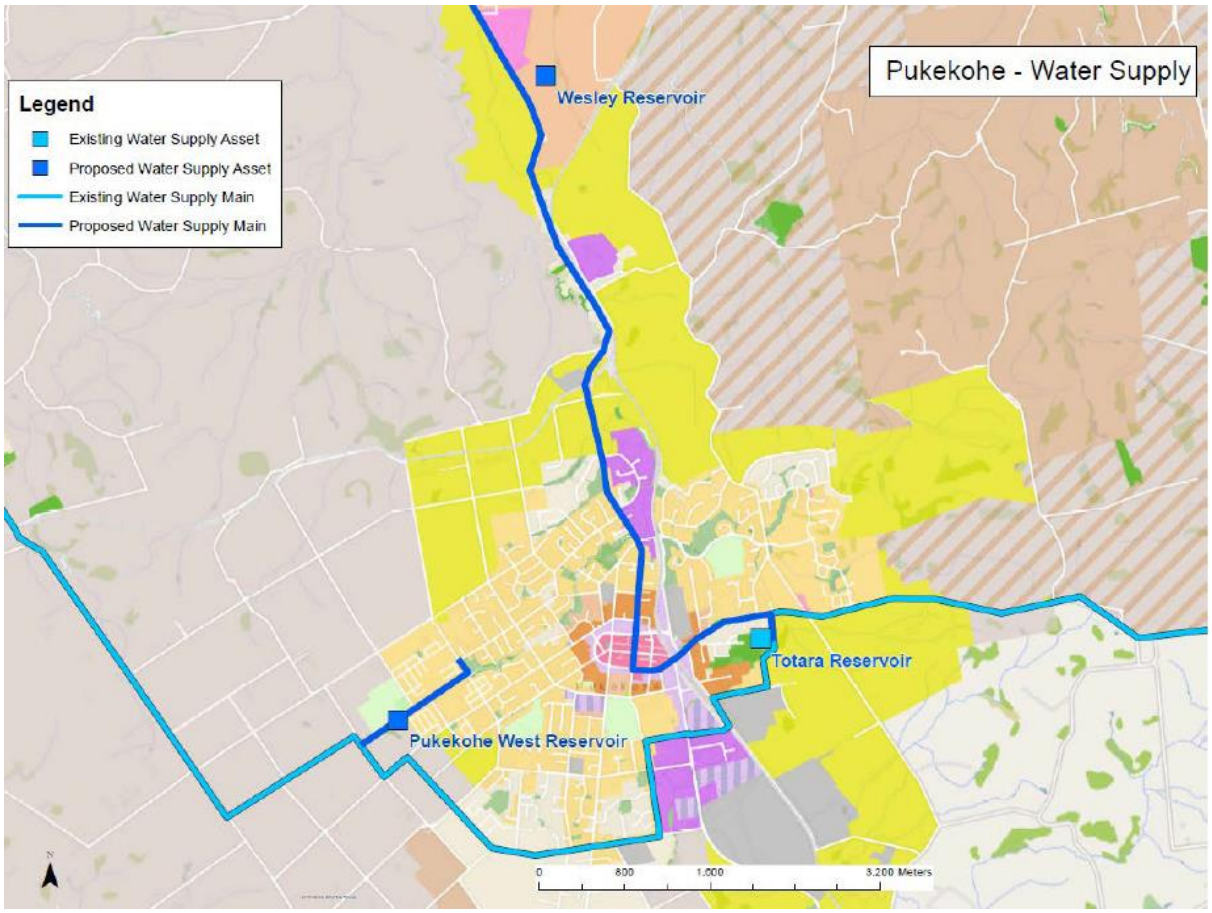


Figure 10 - Indicative Paerata/Pukekohe Servicing Plan (Source Auckland Council)

3.2 EXISTING INFRASTRUCTURE UPGRADE WORKS

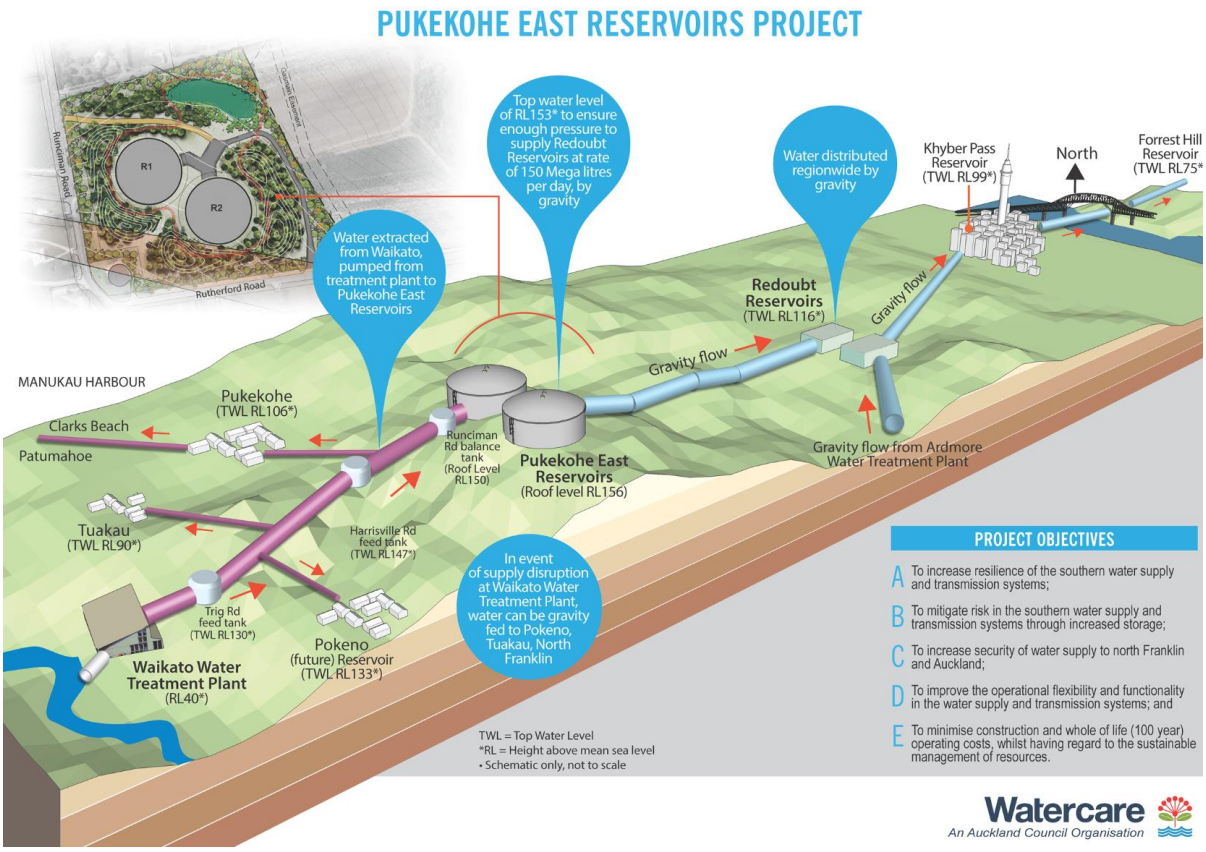
WaterCare guidelines require a minimum level of service to every property, supply at least 25l/s flow at a minimum pressure of 250 kPa or 25m head.

Our understanding is the existing local water supply network has issues of varying pressures high head losses, high velocities, high water age estimates and general supply concerns. Watercare is currently undertaking water supply improvement works to increase security of water supply to cater for the growth of Pukekohe and Paerata including capacity to service the Future Urban Zone, within

which this proposed Plan Change is located. The current works being undertaken are Anzac Road Reservoir Improvements and Pukekohe East Reservoirs Project:

Future water supply improvements and projects:

- New local reservoir to service the Paerate area, to be connected into the existing infrastructure.
- A new transmission service reservoir and boost pump station to service the growth in western Pukekohe, to be connected into the existing Pukekohe 1 transmission watermain.
- Pukekohe East Reservoirs (Runciman Road) is under the construction. Refer to the screenshot below:



- Longer term, a new transmission watermain will be constructed from Drury and connected into Totara Reservoir.

These improvements will improve the resilience and security of the Water Supply for the southern region, best described as being the historic Franklin District.

3.3 PROPOSED DEVELOPMENT

The master plan for the proposed development relates to a 66ha area which is currently zoned as Future Urban Zone and Special Purpose Zone. The proposed development would involve the private zone change which will create approximately 800 potential mixed zoned lots, including Mixed Housing Urban Zone and 800 jobs in the Light Industry Zone.

3.4 PROPOSED WATER SUPPLY SERVICES

The proposed water supply networks must be able to service both peak demand and firefighting scenarios. According to Watercare Water Code of Practice and SNZ PAS 4509, the minimum flow is 25L/s for residential area and the minimum residual pressures during fire flow is 100kPa. Rooseville Park is the best option for the water supply of the proposed Plan Change, extending the existing reticulation down Golding Road from Pukekohe East Road to supply the Plan Change area from the west. When demand has grown sufficiently, the supply can be looped up Station Road to connect back onto the Pukekohe Reticulation at Subway Road.

The Top Water Level of Rooseville Park Reservoir is RL 106m and the majority of the developing area is located at RL 55m to RL 65m (Approximately height after the bulk earthwork), giving a head of 51m or 510kPa.

FIRE WATER CLASSIFICATION

Fire Water Classification	**Reticulated Water Flow Required**
Residential FW2	25L/s
Business FW4 (FW2 with Sprinklers)	100L/s (25L/s)

PEAK WATER DEMAND

Zone (Lots/Jobs)	**Average Daily Demand (L)**	**Peak Daily Demand (L/d)**	**Peak Hourly Demand (L/s)**
≈800 Lots	530,000 (530m³)	1,060,000 (1,060m³)	30.67L/s
≈800 Jobs (Light water use Industry)	53,000 (53m³)	106,000 (106m³)	3.07L/s
Total	583,000 (583m³)	1,166,000 (1,166m³)	33.74L/s

To minimise water demand for firefighting purposes, it is anticipated that all buildings within the Industrial Zone will be required to have sprinklers installed at the time of construction.

The entire development area is located within a 2.5km radius of the reservoir and all areas of the development can be serviced by mains located within the road reserve. Worst case scenario is that pipe lengths are 3700m long from reservoir to point of supply, dependent on final road alignments. Feedback has been received from WaterCare regarding the supply, and the proposed supply scenario has incorporated the recommendations from WaterCare. The proposal indicates various scenarios and flow rates, including Fire Fighting:

The proposed water supply is from Golding Road/Pukekohe East Road, extending the existing network down Golding Road with a ID250mm Pipe (DN315 PE).

This can satisfy an approximate demand of 89l/s with residual pressure >100kPa.

This is derived from the Water Supply Head of 51m less friction head loss of 41m = 10m Residual pressure or 100kPa.

This supply well exceeds the anticipated demand including firefighting for the plan change, which is expected to be ≈60l/s, allowing for excess capacity to service an additional 400 lots.

Friction Head Loss Calculator

Pipe Material:	Polyethylene, PE	
Hazen Williams Coefficient (C):	140	
Pipe Internal Diameter (d):	250	mm
Pipe Length (L):	3700	m
Flow Rate (Q):	89	liter/second

Calculate Reset

Results

Pipe Material: Polyethylene, PE

Friction Head Loss: **40.555** m H2O

Fluid Velocity: **1.813** m/s

This pipe can also supply up to 70l/s maintaining a Residual Pressure of 250 kPa:

Friction Head Loss Calculator

Pipe Material:	Polyethylene, PE	
Hazen Williams Coefficient (C):	140	
Pipe Internal Diameter (d):	250	mm
Pipe Length (L):	3700	m
Flow Rate (Q):	70	liter/second

Calculate Reset

Results

Pipe Material: Polyethylene, PE

Friction Head Loss: **25.995** m H2O

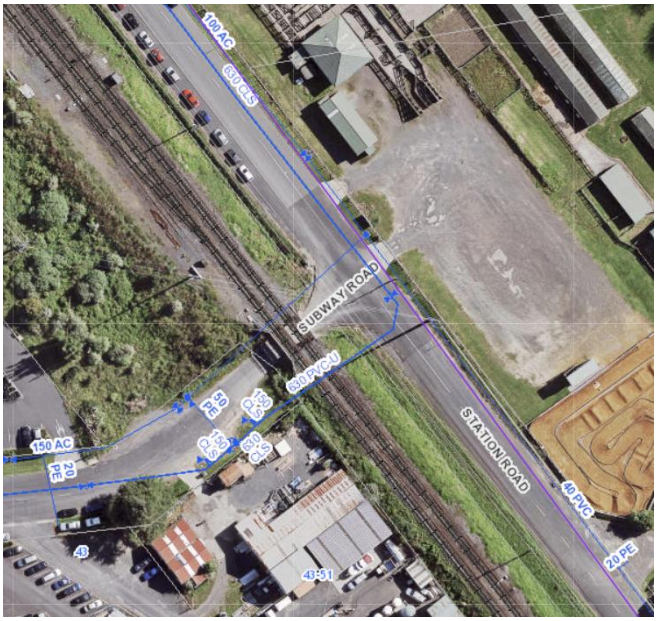
Fluid Velocity: **1.426** m/s

The Station Road connection details can be determined at resource consenting and constructed once the population threshold is realised.

We also acknowledge that actual pipe layout and sizes will be determined at the consenting stage and engineering plan approval, to show adequacy of service and that the required water pressures are being achieved.

Once the population connected to this watermain exceeds a connected population of 1000 people, a second feed will need to be constructed to provide network resilience.

The second Water Main feed will be constructed along Station Road to link into the existing reticulation near Subway Road. This population threshold will be achieved once 40% of the lots within the Golding Road Plan Change area are occupied (assuming 3 occupants per property as per WaterCare Standards Table 6.1a)



3.5 FUNDING PROPOSAL

The extension of new water supply infrastructure for the proposed development will be funded by developers and the new infrastructure and assets will be vested to Auckland Council. Some existing mains in Station Road and Birch Road may need to be upgraded by WaterCare in time to service the Future Urban Zone not part of this Plan Change. Opportunities also exist to work collaboratively with WaterCare to upsize the proposed mains, and Future Proofing the infrastructure with investment from WaterCare, allowing for ultimate development of the Pukekohe Paerata Structure Plan area.

APPENDIX A

WASTEWATER PLAN SET:

INDICATIVE WASTEWATER PLANS

ZONING AND STAGING PLANS

I/We confirm that this proposal has been examined by me/us and agree to the use and reproduction of this plan for the purpose of obtaining a resource consent

.....
Applicants Approval

Approved for submission by: .....
Birch Surveyors Ltd

KEY

Proposed Lots

Abuttal Boundaries

Prop. Wastewater Pipe

NOTES:

1) Areas and measurements are approximate only and subject to final survey
2) Roads shown are legal
3) Datum is arbitrary and subject to final survey
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LOCAL AUTHORITY	AUCKLAND COUNCIL
PLANNING MAP	-
ZONING	FUTURE URBAN ZONE & MAJOR RECREATION FACILITY ZONE
ACTIVITY	
COMPRISED IN	-
TOTAL AREA	-
REGISTERED OWNERS	-
	-

PROJECT NAME

PROPOSED GOLDING ROAD PLAN CHANGE

GOLDING ROAD
PUKEKOHE

Surveyed	-	Date	-
Designed	-	Date	-
Drawn	J.MCKAY	Date	07/2020
Approved	PROJECT MANAGER	Date	

Project No. 4294

Scale Hz: 1:5000 @ A3

REV.	BY	DATE	COMMENT
A	JM	07/20	INITIAL DRAFT
B	JM	05/21	SUBMISSION
C	KB	11/21	ZONE CHANGE

TITLE

INDICATIVE WASTEWATER LAYOUT

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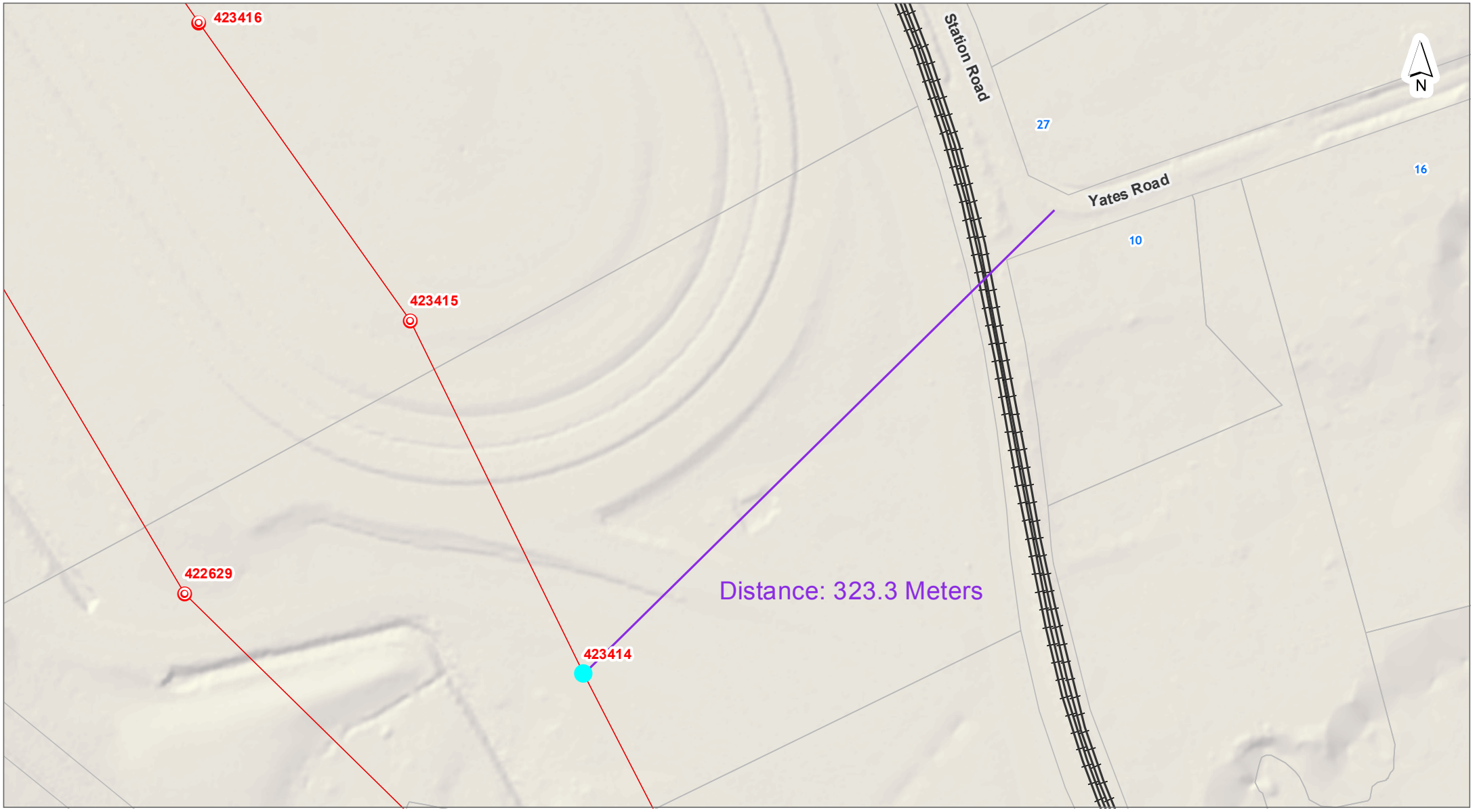


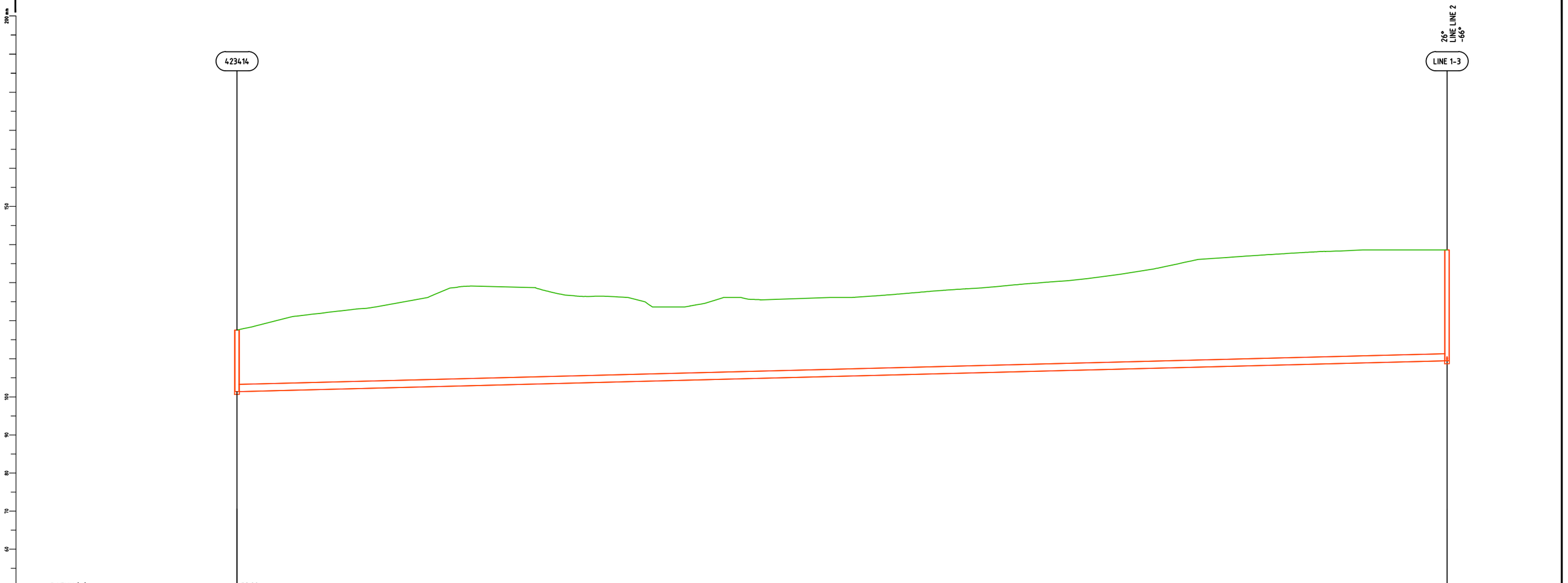
Pukekohe Transmission Pump station

0 10 20 30
Meters

Scale @ A4
= 1:2,500

Date Printed:
15/06/2020

Auckland Council
Te Kaunihera o Tāmaki Makaurau



DATUM (m)	39.00		
PIPE SIZE (mm)	375		
PIPE CLASS	uPVC SN16		
PIPE GRADE (%)	0.510		
PIPE COVER MINIMUM	2.88		
NATURAL SURFACE LEVEL	52.79		57.00
DESIGN SURFACE LEVEL	52.79		57.00
INVERT LEVEL	49.56	49.56	51.18 51.17
DEPTH TO INVERT	3.23	3.23	5.82 5.83
PIPE LENGTH & PIPE CHAINAGE	0.00		317.81 317.81
PIT SETOUT	6234.46mN 3924.14mE		6575.13mN 4142.76mE

original size A3

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Quality ISO 9001

LOCAL AUTHORITY	AUCKLAND COUNCIL
PLANNING MAP	-
ZONING	FUTURE URBAN ZONE & MAJOR RECREATION FACILITY ZONE
ACTIVITY	
COMPRISED IN	-
TOTAL AREA	-
REGISTERED OWNERS	-

PROJECT NAME

PROPOSED GOLDING ROAD PLAN CHANGE

GOLDING ROAD
PUKEKOHE

Surveyed -	Date -	Project No.	4294
Designed -	Date -	Scale	Hz: 1:2000 @ A3
Drawn J.MCKAY	Date 07/2020		
Approved PROJECT MANAGER	Date		

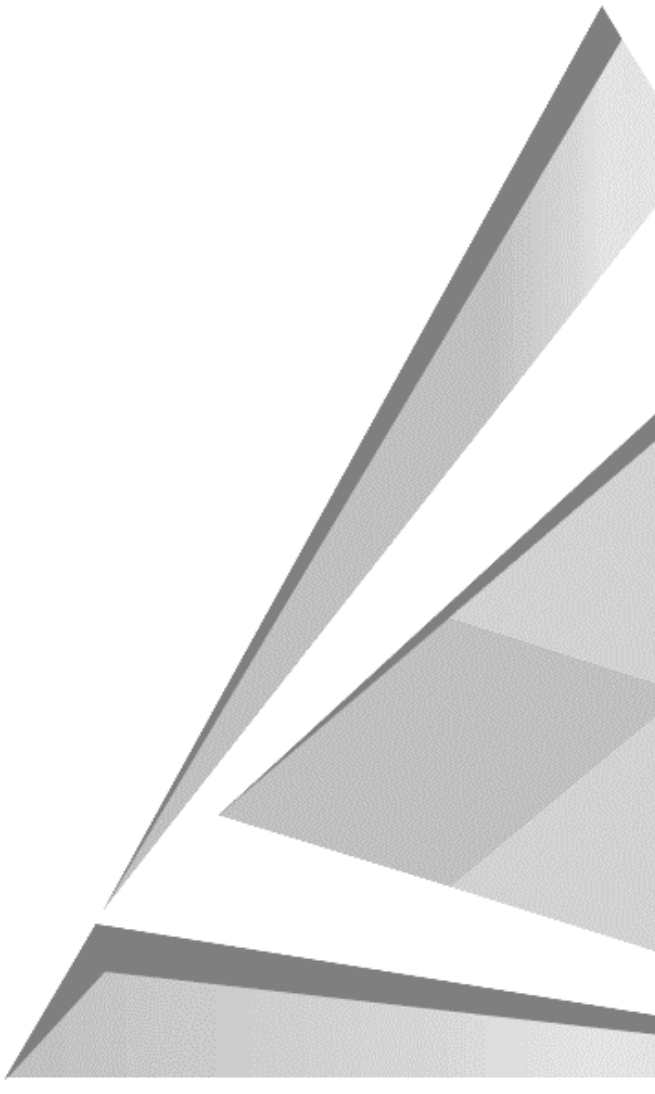
REV.	BY	DATE	COMMENT
A	JM	07/20	INITIAL DRAFT

TITLE

LONGSECTION OF INDICATIVE WASTEWATER CONNECTION TO EX MH (423414)

Drawing Name	F:\..\CAD\SP XXXX VERSION.dwg /	SUBJECT TO FINAL SURVEY	Rev.	A

APPENDIX B
WASTEWATER CALCULATIONS



2a Wesley Street
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Pukekohe 2340

BIRCH SURVEYORS LTD
Land Surveyors | Resource Consultants | Planners

ph: 09 237 1111
fax 09 238 0033

Industrial Zone Lot Size = 1000

	Consent	Ultimate Development
A=	159000	159000
Jobs =	588	588

Mixed Urban Zone Lot Size = 300

	Consent	Ultimate Development
A (m^2)=	400000	523247
Lots =	920	1203

Plan Change Residential Development

Residential Lots =	920	Design Population =	2760
		ADWF (l/s) =	5.75
PDWF=	3		
PWWF=	6.7		
Self Cleansing Design Flow (l/s) =			17.25
Peak Design Flow (l/s)=			38.53

Ultimate Residential Development

Residential Lots =	1203	Design Population =	3609
Industrial Lots =	0	ADWF (l/s) =	7.52
PDWF=	3		
PWWF=	6.7		
Self Cleansing Design Flow (l/s) =			22.56
Peak Design Flow (l/s)=			50.38

Industrial Development

Industrial Zone Area (m^2)	159000	RPDD (l/m^2/d)=	4.5
		ADWF (l/s) =	8.28
PDWF=	5		
PWWF=	6.7		
Self Cleansing Design Flow (l/s) =			41.41
Peak Design Flow (l/s)=			55.48

Ultimate Development WW FLOWS

Ultimate Self Cleansing Design Flow (l/s) =	63.96
Ultimate Peak Design Flow (l/s)=	105.86

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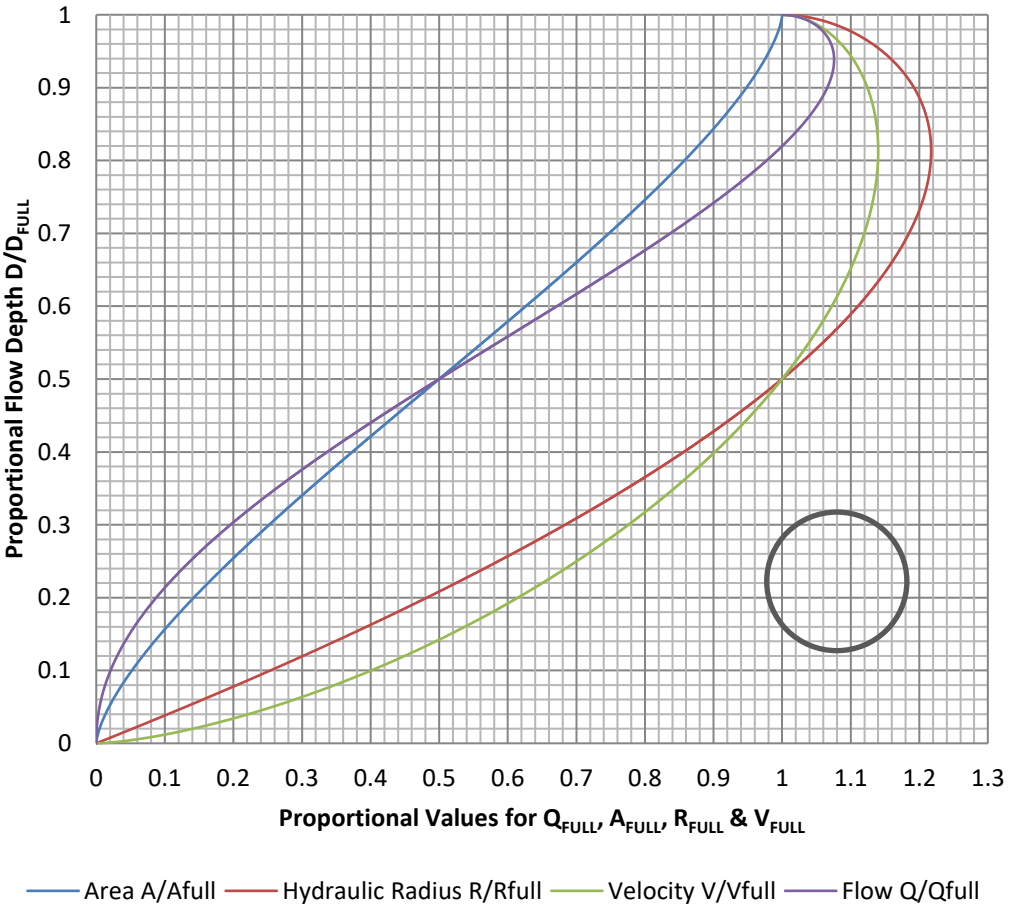
Station Road to Ex. WWMH (GIS ID 423414) - Minimum Gradient

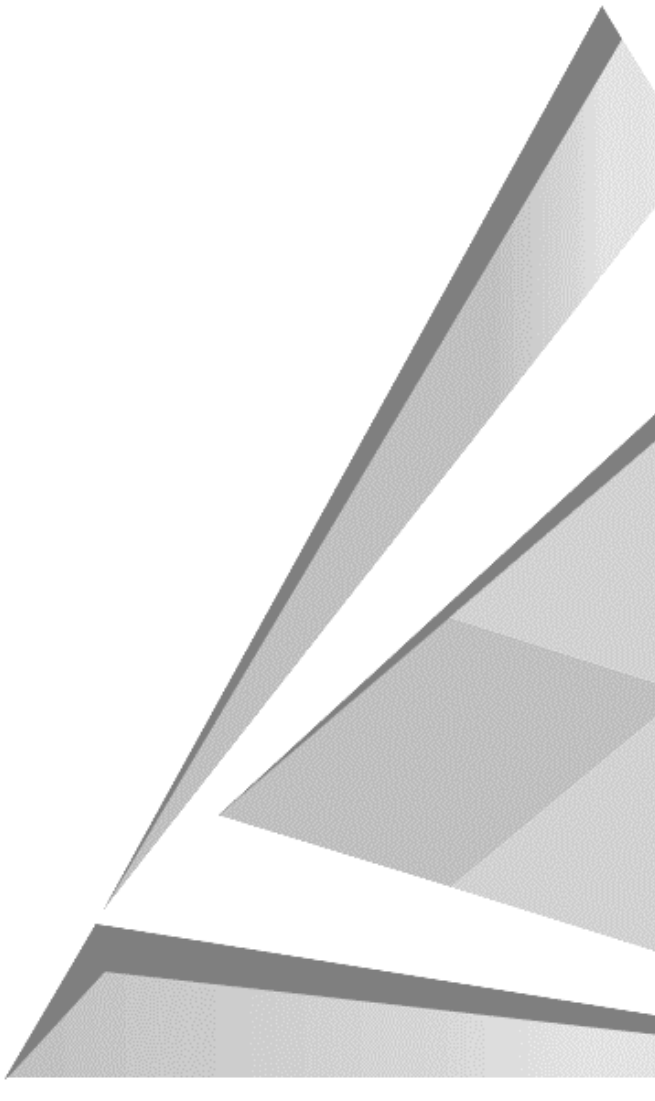
Enter Pipe Diameter:	375	mm
Enter Pipe Grade:	1 : 200	
Select Pipe Material:	uPVC	n = 0.013
Maximum Flow in Pipe:	133.36	l/s
Full Flow in Pipe:	123.98	l/s
Velocity at Full Flow in Pipe:	1.12	m/s
Enter Catchment Flowrate:	106	l/s
Depth of Flow in Pipe:	267	mm
Velocity of Flow in Pipe:	1.26	m/s

Hydraulic Elements of Circular Pipes



The flow depth and velocities are calculated to the maximum flow, not full pipe flow. This will calculate the maximum flow velocity for any flow rate, giving a small margin of error for flow depths greater than 91%.

APPENDIX C
WATERCARE TECHNICAL REPORT FOR PUKEKOHE/PAERATA STRUCTURE PLAN



Water and Wastewater Servicing Plan

Draft Pukekohe/Paerata Structure Plan

Prepared by Chris Allen, Watercare Services Limited

Auckland Council
Te Kaunihera o Tāmaki Makaurau

Table of Contents

1 Executive Summary

This report confirms that the anticipated development yield from the draft structure plan can be serviced for water and wastewater. This report sets out the water and wastewater plan for servicing the structure plan area. It is based on an anticipated yield from the structure plan area of around 12,500 dwellings, in addition to the existing live zoned residential land in Paerata and any intensification of the existing urban area. Watercare is investing in trunk water and wastewater networks to service the existing live zoned developments underway, allowing to bring forward the structure planning of the future urban zoned land.

1.1.1 Water

Watercare provides both bulk and local water and wastewater services to the Pukekohe/Paerata area. Some of these assets are reaching the limits of their ability to provide water services to a growing community.

There are existing issues within the Pukekohe water network, which expected growth within the structure plan area will exacerbate.

Trunk and local network pipelines providing water to the draft structure plan area are being designed to meet the proposed yield. Watercare will undertake trunk upgrades and work with developers to upgrade water assets to service the structure plan area as required. Water pipelines will follow roading alignments and be constructed in conjunction with the roads, as part of individual development proposals. All new pipelines will consider the future development potential when being designed and constructed.

Trunk and local network pipelines providing water to the draft structure plan area will be designed to meet the anticipated yield. All new pipelines will consider the upstream and downstream development potential when being designed and constructed.

1.1.2 Wastewater

The existing network has limited capacity to accommodate additional flows. Watercare will undertake upgrades in the existing wastewater network to accommodate the anticipated yield. The Pukekohe transmission pump station and the pipe between Pukekohe and the wastewater treatment plant have capacity for the expected growth, and will be upgraded as required to meet additional growth expectations.

Trunk and local network pipelines collecting and conveying wastewater from the structure plan areas are being sized to meet the anticipated development yield. Watercare will undertake trunk upgrades and work with developers to upgrade wastewater assets to service the structure plan area as required. Local wastewater pipes will be constructed in alignment with individual development proposals. All new pipelines will consider the upstream and downstream development potential when being designed and constructed.

2 Introduction

2.1 Purpose and scope of the report

This report sets out the water and wastewater servicing plan for the Pukekohe/Paerata Structure Plan Area. It is a supporting document that forms part of the draft structure plan information.

2.2 Study Area

The study area for the draft Pukekohe/Paerata Structure Plan is the Future Urban zone around Pukekohe/Paerata and the live zoned land in northern Paerata. It comprises around 1,300ha of land. The study area is shown coloured yellow Figure 1 below. The anticipated dwelling yield for the structure plan area is around 12,500 dwellings. The live zoned land at Paerata adds another 4,500 dwellings, the live zoned land at Belmont adds 720 dwellings and there will likely be intensification of the existing urban area.

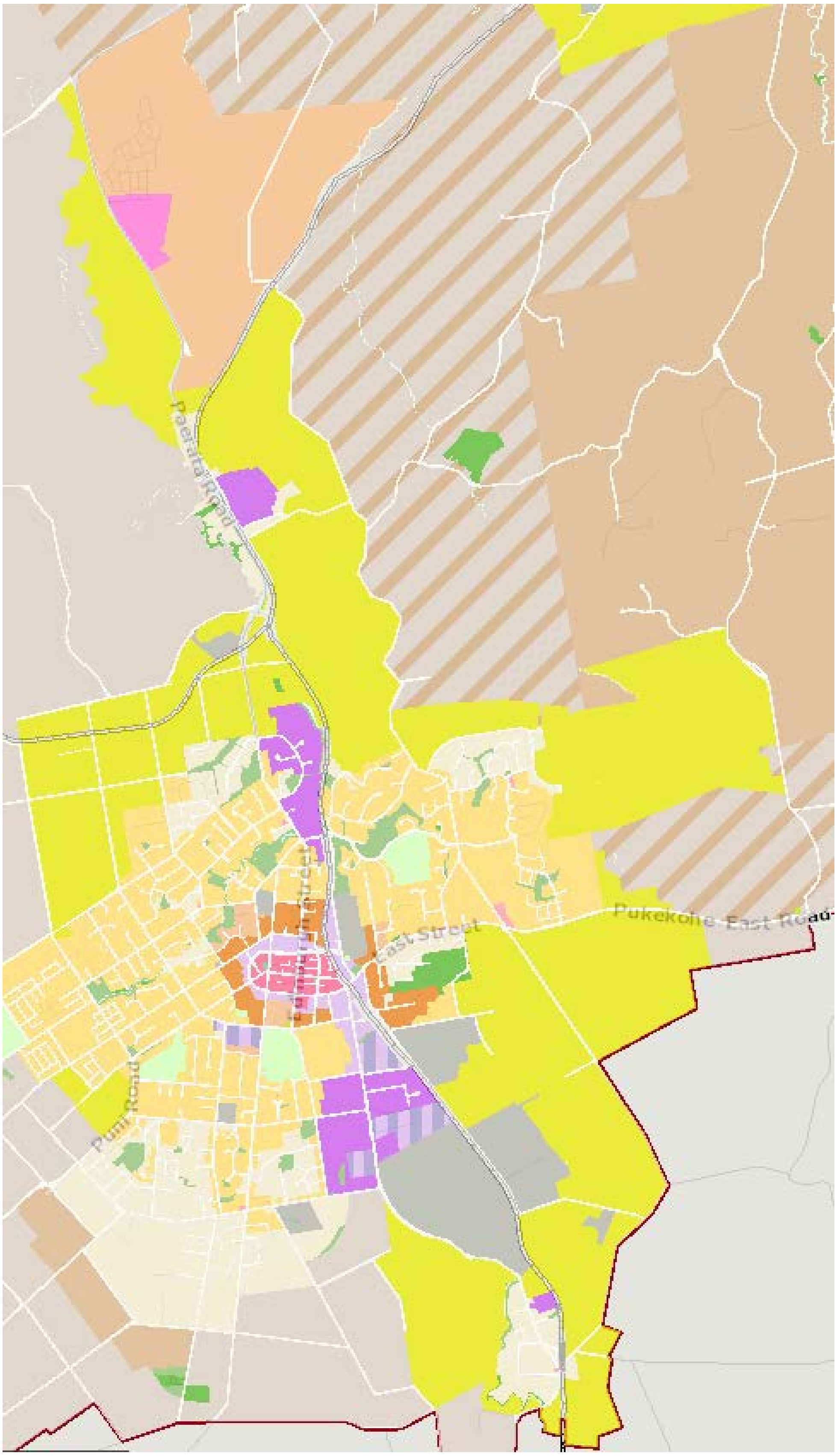


Figure 1: Pukekohe/Paerata structure plan study area (coloured yellow)

3 Existing environment

3.1 Description of study area

There is existing network infrastructure in place to provide both water and wastewater services to the existing urban area in Pukekohe/Paerata. There are currently no constructed assets in the draft structure plan area, although services are being constructed by developers as development occurs. The existing Paerata development has constructed both water and wastewater services, connected to the urban Pukekohe network, to provide these services.

3.1.1 Water

Water is abstracted from the Waikato River and treated at the Waikato water treatment plant. Treated water is then transferred through the Waikato 1 watermain to the Redoubt Road reservoir complex servicing wider Auckland. Pukekohe 1 watermain connected from the Waikato 1 runs along Pukekohe East Road into Pukekohe. This watermain feeds storage reservoirs at Totara Avenue and Kitchener Road reservoirs. The Kitchener Road pump station supplies the Anzac reservoir. The Anzac Road pump station then supplies the Hill Reservoir also on Anzac Road. These reservoirs supply the local networks servicing the individual customers.

In addition to the transmission mains, there are also hundreds of kilometres of smaller diameter pipes in each street, servicing individual customers.

3.1.2 Wastewater

The existing Pukekohe/Paerata wastewater network is predominantly a gravity system, but also includes a number of pump stations, and has limited capacity for population growth. The wastewater network collects wastewater from Pukekohe/Paerata, transferring it to the Pukekohe wastewater treatment plant via the recently constructed Pukekohe transmission pump station at the Pukekohe Raceway. The Pukekohe plant also collects and treats flows from Pokeno and Tuakau as well. Highly treated wastewater is then discharged back into the Waikato River. The treatment plant has recently been granted a 35 year discharge consent by the Waikato Regional Council.

The length of trunk main to the plant is around 7km overall, the majority of which is in the Waikato region. There are also hundreds of kilometres of smaller diameter pipes in each suburb and street, servicing individual customers.

The existing network has capacity during dry weather, but is significantly influenced by wet weather events as rain enters the wastewater network eroding capacity. There is limited capacity to accept additional growth in the existing network. The recently constructed Pukekohe transmission pump station has been constructed to accommodate ultimate future flows from Pukekohe/Paerata, and has capacity for the flows from the structure plan

area, as well as the lived zoned undeveloped land and forecast intensification within the existing urban area.

4 Draft Pukekohe/Paerata Structure Plan

4.1 Overview of draft Pukekohe/Paerata Structure Plan

The draft Pukekohe/Paerata Structure Plan 2019 shows the arrangement of various land uses (residential, business, and parks) and infrastructure. It also shows how these areas connect to adjacent urban areas and wider infrastructure networks. Important cultural values, natural features and heritage values are also addressed.

With the development of the residential zonings shown on the draft Pukekohe/Paerata - Structure Plan 2019, the population of Pukekohe-Paerata could roughly double to a total population of approximately 65,750. The proposed residential zonings will add capacity for around 12,500 new dwellings in the structure plan area. Live zoned land at Paerata adds a further 4,500 dwellings, the live zoned land at Belmont adds 720 dwellings and there will be some intensification within the existing urban area. The draft Pukekohe/Paerata Structure Plan 2019 is also estimated to provide for 5,000 new jobs. These estimates are based on current development feasibility and exclude areas that may not be developable because of constraints.

4.2 Assessment of the Draft Pukekohe/Paerata Structure Plan

4.2.1 Draft Structure Plan Development Yield

The development yield anticipated by the draft structure plan can be serviced for water and wastewater. The above ground assets are generally minimal. Land requirements for these assets vary depending on the population connected to them, and can range from approximately one standard lot size up to four or five standard lots sizes. These lots are created as part of development proposals as required, or located on publicly owned land where appropriate. The land is transferred to Watercare as part of the development, but is not normally designated.

4.2.2 Water

The existing water services to Pukekohe/Paerata will remain operational. There is some capacity to accept additional growth, however these assets are reaching the limits of their ability to provide a water service to a growing community.

There are existing issues within the Pukekohe water network, including low pressure areas, high pressure areas, high headlosses, high velocities, high water age estimates and security of supply concerns. Watercare has recently completed an investigation of the issues and has started an improvement programme. Expected growth within the structure plan area will exacerbate these issues, however infrastructure required to service the expected growth will also offer opportunities for solutions.

To service the full development of the Paerata area a new local service reservoir will be required. It will connect into the existing infrastructure. To service the growth in western Pukekohe a new transmission service reservoir and boost pump station are required. These will be connected to the existing Pukekohe 1 transmission watermain.

Longer term, to give security of supply to Pukekohe a new transmission watermain will be constructed from Drury also connected to the Totara Road reservoir. This main is not required to facilitate growth. It provides source resilience to the community, and will be constructed as necessary to minimise outage risks.

The Runciman Reservoirs are under construction currently. Generally these balancing tanks do not service the structure plan area. The reservoir does however provide resilience to the Pukekohe and Paerata water supply. Under emergency conditions water can be fed to the reservoir from the Drury pump station to the north, and service can be maintained for Pukekohe and Paerata through these reservoirs.

Trunk and local network pipelines providing water to the draft structure plan area are being designed to meet the anticipated yield. Watercare will undertake trunk upgrades and work with developers to upgrade water assets to service the structure plan area as required. As much as practical, water pipelines will follow roading alignments as this is preferred for consenting and access during construction, maintenance and renewal. All new pipelines will consider the future development potential when being designed and constructed. The

majority of these assets will be constructed by developers in conjunction with their development proposals.

The map that shows an indicative servicing plan for transmission water infrastructure in the draft structure plan area is below. As noted above, the majority of the water assets will be constructed by developers as part of their development proposals.

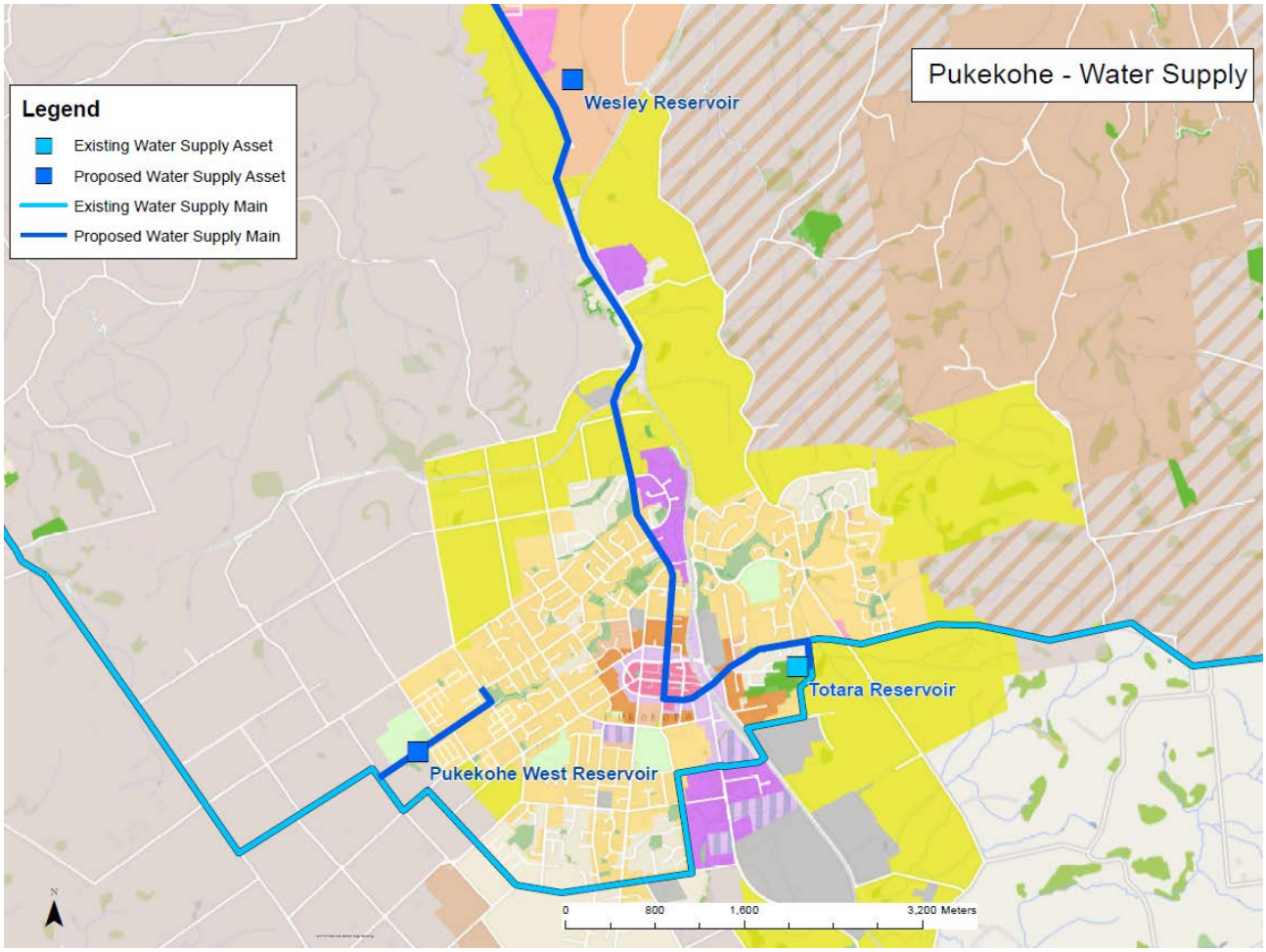


Figure 2: Indicative Pukekohe/Paerata Water Servicing Plan

4.2.3 Wastewater

The northern, north western and north eastern portion of the Pukekohe/Paerata draft structure plan population will connect to the existing wastewater network immediately to the north of the Raceway. A transmission new pump station will be required in the area around Isabella Drive. This new pump station will collect the flows from the northern portion of the structure plan area and transfer the flows to new networks connecting back into the existing network immediately upstream of the Raceway, and then into the existing Pukekohe transmission pump station. The pump station itself and the pipe to the treatment plant have capacity for the expected growth, and will be upgraded as required into the future to accommodate growth outside of the 30 year structure plan timeframes. The

required infrastructure will be staged to meet development, starting with the new transmission pump station near Isobella Drive.

The existing network has limited capacity to accommodate additional flows. A study of the wastewater network is currently underway, to identify the operational and asset options at a more detailed level. Options to provide additional capacity will include operational measures including inflow and infiltration programmes and real time control of the existing pump stations, as well as capital measures upgrading and augmenting the existing network with new infrastructure.

The south eastern portion of the area will connect more directly to the Pukekohe transmission pump station, with most of the wastewater infrastructure constructed by developers, working with Watercare around servicing, as part of their development proposals.

The south western area is likely to require new assets augmenting the existing network. These assets will be constructed by developers and connect into the Pukekohe transmission pump station.

The draft structure plan area will have gravity collector sewers in all catchments, supported by a number of pump stations where required. These assets will be constructed by developers in conjunction with their development proposals.

Trunk and local network pipelines collecting and conveying wastewater from the structure plan areas are being sized to meet the anticipated development yield. While gravity wastewater networks are heavily influenced by local topography, as much as practical pipelines will follow roading alignments as this is preferred for consenting and access during construction, maintenance and renewal. All new pipelines will consider the upstream and downstream development potential when being designed and constructed. Watercare will undertake trunk upgrades and work with developers to upgrade wastewater assets to service the structure plan area as required.

The map that shows an indicative servicing plan for wastewater infrastructure in the draft structure plan area is below. This includes assets expected to be constructed by Watercare, as well as assets servicing the local catchments, expected to be constructed by developers.

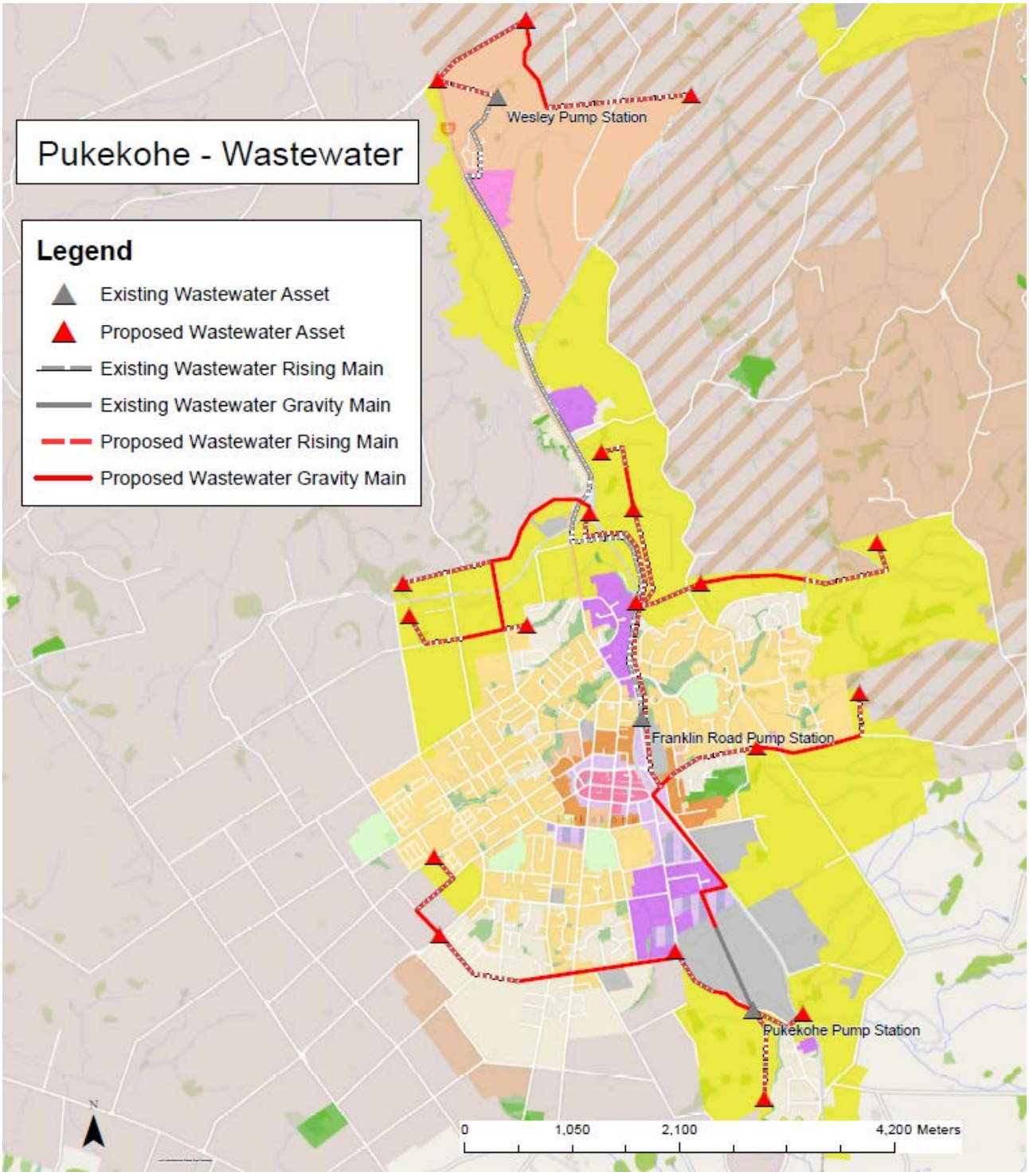


Figure 3: Indicative Pukekohe/Paerata Wastewater Servicing Plan

4.2.4 National Policy Statement/s

4.2.4.1 National Policy Statement on Urban Development Capacity 2016 (NPS-UDC)

Auckland is defined as high growth area (by MFE guidance), and accordingly there are a number of objectives which must be implemented to give effect to the NPS-UDC. In particular, Objective OD1 of the NPS-UDC requires the integration of urban growth and

infrastructure. Objective D1 is delivered in part by Policy A3 which applies to any urban environment that is expected to experience growth.

> *Policy A3: When making planning decisions that affect the way and the rate at which development capacity is provided, decision-makers shall provide for the social, economic, cultural and environmental wellbeing of people and communities and future generations, whilst having particular regard to:*
>
> *a) Providing for choices that will meet the needs of people and communities and future generations for a range of dwelling types and locations, working environments and places to locate businesses;*
>
> *b) Promoting the efficient use of urban land and development infrastructure and other infrastructure; and*
>
> *c) Limiting as much as possible adverse impacts on the competitive operation of land and development markets.*

The key messages from the NPS-UDC is to provide a range of housing choice, efficient use of land and infrastructure and provide for current and future people and communities.

4.2.4.2 National Policy Statement for Freshwater Management 2014

The National Policy Statement for Freshwater Management (Freshwater NPS) provides direction for the council on the management of freshwater. The council must give effect to the Freshwater NPS through the provisions of AUPOP – notably through RPS B7.4 and the Auckland-wide provisions. Some of these provisions are relevant to structure planning.

Wastewater

> (10) Manage the adverse effects of wastewater discharges to freshwater and coastal water by all of the following:
>
> > (a) ensuring that new development is supported by wastewater infrastructure with sufficient capacity to serve the development;
> >
> > (b) progressively reducing existing network overflows and associated adverse effects by all of the following:
> >
> > > (i) making receiving environments that are sensitive to the adverse effects of wastewater discharges a priority;
> > >
> > > (ii) adopting the best practicable option for preventing or minimising the adverse effects of discharges from wastewater networks including works to reduce overflow frequencies and volumes;
> > >
> > > (iii) ensuring plans are in place for the effective operation and maintenance of the wastewater network and to minimise dry weather overflow discharges;

(iv) ensuring processes are in place to mitigate the adverse effects of overflows on public health and safety and the environment where the overflows occur;

(c) adopting the best practicable option for minimising the adverse effects of discharges from wastewater treatment plants; and

(d) ensuring on-site wastewater systems avoid significant adverse effects on freshwater and coastal water.

Freshwater and geothermal water quantity, allocation and use

(11) Promote the efficient allocation of freshwater and geothermal water by all of the following:

(a) establishing clear limits for water allocation;

(b) avoiding over-allocation of water, including phasing out any existing overallocation;

(c) safeguarding spring flows, surface waterbody base flows, ecosystem processes, life-supporting capacity, the recharge of adjacent aquifers, and geothermal temperature and amenity; and

(d) providing for the reasonable requirements of domestic and municipal water supplies.

(12) Promote the efficient use of freshwater and geothermal water.

(13) Promote the taking of groundwater rather than the taking of water from rivers and streams in areas where groundwater is available for allocation.

(14) Enable the harvesting and storage of freshwater and rainwater to meet increasing demand for water and to manage water scarcity conditions, including those made worse by climate change.

4.2.5 Auckland Plan 2050 (2018)

The Auckland Plan 2050 (“Auckland Plan”) is a long-term spatial plan to ensure Auckland grows in a way that will meet the opportunities and challenges of the future.

The Development Strategy in this plan and 30-year Infrastructure Strategy address the prioritisation, sequencing and funding of essential infrastructure. This includes requirements under the National Policy Statement on Urban Development Capacity to provide sufficient feasible development capacity in the medium and long term.

Within the Auckland Plan, Pukekohe/Paerata structure plan area is defined as a satellite town functioning as the major rural node in the south of Auckland. It provides a range of services to the surrounding rural areas. Significant future employment growth is anticipated alongside residential growth.

The Auckland Plan is a critical document in future Resource Management Act 1991 processes in Auckland. It will be a key driver of future plan changes to Unitary Plan, including Council-initiated and private plan changes to "live zone" future urban areas. It will also be relevant for the assessment of future resource consent applications. The Auckland Plan has close links with the Future Urban Land Supply Strategy. The strategy informs the greenfield element of the Auckland Plan Development Strategy which makes up a portion of the overall growth anticipated over the next 30 years. The FULSS sets out sequencing for the release of development ready land (large future urban areas).

4.2.6 Future Urban Land Supply Strategy

The purpose of the Future Urban Land Supply Strategy (FULSS 2017) is to identify the sequencing and timing of future urban land for development over a 30-year timeframe. This is to integrate supply of greenfield land for development and provision of infrastructure. The proposed sequencing of development ready future urban zoned land in Pukekohe/Paerata is as follows:

- Paerata (Wesley) (live zoned now)
- Paerata (remainder) (Decade One 1st half 2018-2022)
- Pukekohe (Decade One 2nd half 2023-2027)

This strategy also addresses the council's obligations under The NPS-UDC which requires the council to ensure there is greater focus on enabling urban development and that there is sufficient capacity for housing and businesses. As noted in section 4.1.1, NPS-UDC requires the integration of urban growth and infrastructure.

4.2.7 The Auckland Unitary Plan (Operative in Part) (2016)

Regional Policy Statement

The Regional Policy Statement (RPS) is part of the AUPOP. It sets out the overall strategic framework for Auckland. Sections B1 to B10 of the RPS all have varying degrees of relevance to structure planning.

Of particular relevance is Section B3 – Infrastructure, which sets outs objectives and policies relating to infrastructure. Policy 5 for example, requires that Infrastructure planning and land use planning are integrated to service growth efficiently. Policy 6 requires that Infrastructure is protected from reverse sensitivity effects caused by incompatible subdivision, use and development.

> B3. - Infrastructure, transport and energy
>
> B3.2.1. Objectives
>
> (1) Infrastructure is resilient, efficient and effective.
>
> (2) The benefits of infrastructure are recognised, including:

(a) providing essential services for the functioning of communities, businesses and industries within and beyond Auckland;

(b) enabling economic growth;

(c) contributing to the economy of Auckland and New Zealand;

(d) providing for public health, safety and the well-being of people and communities;

(e) protecting the quality of the natural environment; and

(f) enabling interaction and communication, including national and international links for trade and tourism.

(3) Development, operation, maintenance, and upgrading of infrastructure is enabled, while managing adverse effects on:

(a) the quality of the environment and, in particular, natural and physical resources that have been scheduled in the Unitary Plan in relation to natural heritage, Mana Whenua, natural resources, coastal environment, historic heritage and special character;

(b) the health and safety of communities and amenity values.

(4) The functional and operational needs of infrastructure are recognised.

(5) Infrastructure planning and land use planning are integrated to service growth efficiently.

(6) Infrastructure is protected from reverse sensitivity effects caused by incompatible subdivision, use and development.

(7) The national significance of the National Grid is recognised and provided for and it's effective development, operation, maintenance and upgrading are enabled.

(8) The adverse effects of infrastructure are avoided, remedied or mitigated

In terms of RPS relevant objectives, it is noted that:

- The proposed Water and Wastewater Servicing plan generally integrates land use and infrastructure to service future growth of the Pukekohe/Paerata Structure Plan area efficiently
- The Plan will provide essential services for the functioning of communities, businesses and industries within and beyond Pukekohe/Paerata;
- Proposed water and wastewater infrastructure is protected from reverse sensitivity effects caused by incompatible future subdivision, use and development.

District Plan

Chapter E26 of the Auckland-Wide provisions sets out District Level objectives, policies and rules relating to infrastructure. These provisions provide a framework for the development, operation, use, maintenance, repair, upgrading and removal of infrastructure.

The plan recognises that Infrastructure is critical to the social, economic, and cultural well-being of people and communities and the quality of the environment. This means that in some circumstances other activities and development need to be managed in a way that does not impede the operation of infrastructure.

The plan also acknowledges that as well as benefits infrastructure can have a range of adverse effects on the environment, visual amenity of an area, and public health and safety. The sensitivity of adjacent activities, particularly residential, to these effects can lead to complaints and ultimately constraints on the operation of infrastructure. Managing these reverse sensitivity effects is essential.

E26. Infrastructure

E26.2.1. Objectives [rp/dp]

(1) The benefits of infrastructure are recognised.

(2) The value of investment in infrastructure is recognised.

(3) Safe, efficient and secure infrastructure is enabled, to service the needs of existing and authorised proposed subdivision, use and development.

(4) Development, operation, maintenance, repair, replacement, renewal, upgrading and removal of infrastructure is enabled.

(5) The resilience of infrastructure is improved and continuity of service is enabled.

(6) Infrastructure is appropriately protected from incompatible subdivision, use and development, and reverse sensitivity effects.

(9) The adverse effects of infrastructure are avoided, remedied or mitigated

In relation to the relevant District level Infrastructure provisions,:

- The proposed water and wastewater plan will enable the safe, efficient and secure infrastructure to service the needs of existing and authorised proposed subdivision, use and development in Pukekohe/Paerata
- The proposed water and wastewater plan will provide for resilient infrastructure in the Structure Plan area as improved and continuity of service is enabled.

5 Conclusion

Overall it is considered that the yield from the draft structure plan, as well as the live zoned undeveloped land and intensification in the existing urban area, can be serviced for water and wastewater.

Future water connections to existing transmission networks are required to service this structure plan area. Watercare is engaging with the current developers to consider the shorter term infrastructure needs. A water servicing blue print has been developed to support longer term growth aspirations. Trunk and local network pipelines providing water to the draft structure plan area will be designed to meet the anticipated development yield.

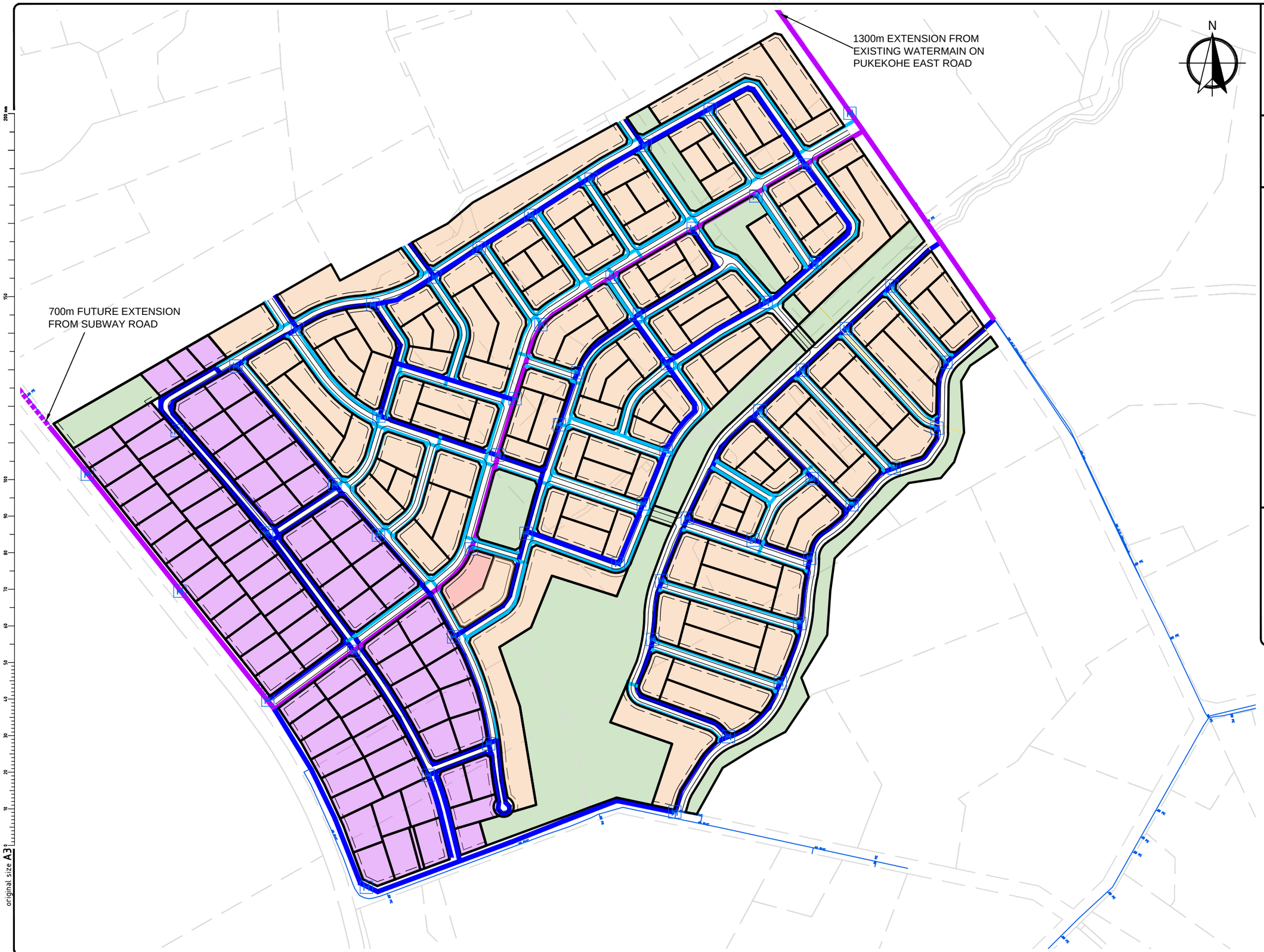
Wastewater will be connected to the existing Pukekohe transmission pump station, and conveyed to the Pukekohe wastewater treatment plant. The Pukekohe transmission pump station and associated downstream infrastructure has recently been constructed, sized to service expected ultimate growth. The Pukekohe wastewater treatment plant has recently had a new discharge consent granted and the upgrade process is underway to meet required growth and consent requirements. Trunk and local network pipelines collecting and conveying wastewater from the draft structure plan area will be sized to meet the anticipated development yield.

The majority of the water and wastewater assets for the structure plan area will be constructed by developers, in discussion with Watercare, to service their developments.

APPENDIX D

WATER SUPPLY PLAN SET

INDICATIVE WATER SUPPLY PLAN



I/We confirm that this proposal has been examined by me/us and agree to the use and reproduction of this plan for the purpose of obtaining a resource consent

.....
Applicants Approval

Approved for submission by: .....
Birch Surveyors Ltd

KEY

- Proposed Lots
- Abuttal Boundaries
- Prop. 250/200mm Watermain
- Prop. 100/150mm Watermain
- Prop. 50/63mm HDPE Pipe
- Upgrade Ex. Watermain
- Prop. Fire Hydrants [H]

NOTES:

1) Areas and measurements are approximate only and subject to final survey
2) Roads shown are legal
3) Datum is arbitrary and subject to final survey
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LOCAL AUTHORITY	AUCKLAND COUNCIL
PLANNING MAP	-
ZONING	FUTURE URBAN ZONE
ACTIVITY	
COMPRISED IN	-
TOTAL AREA	-
REGISTERED OWNERS	-

PROJECT NAME

GOLDING MEADOW DEVELOPMENT LIMITED

154-162 GOLDING ROAD
PUKEKOHE

Surveyed: -	Date: -	Project No.: 4294
Designed: -	Date: -	Scale: Hz: 1:5000 @ A3
Drawn: S.HANG	Date: 07/2020	
Approved: PROJECT MANAGER	Date:	

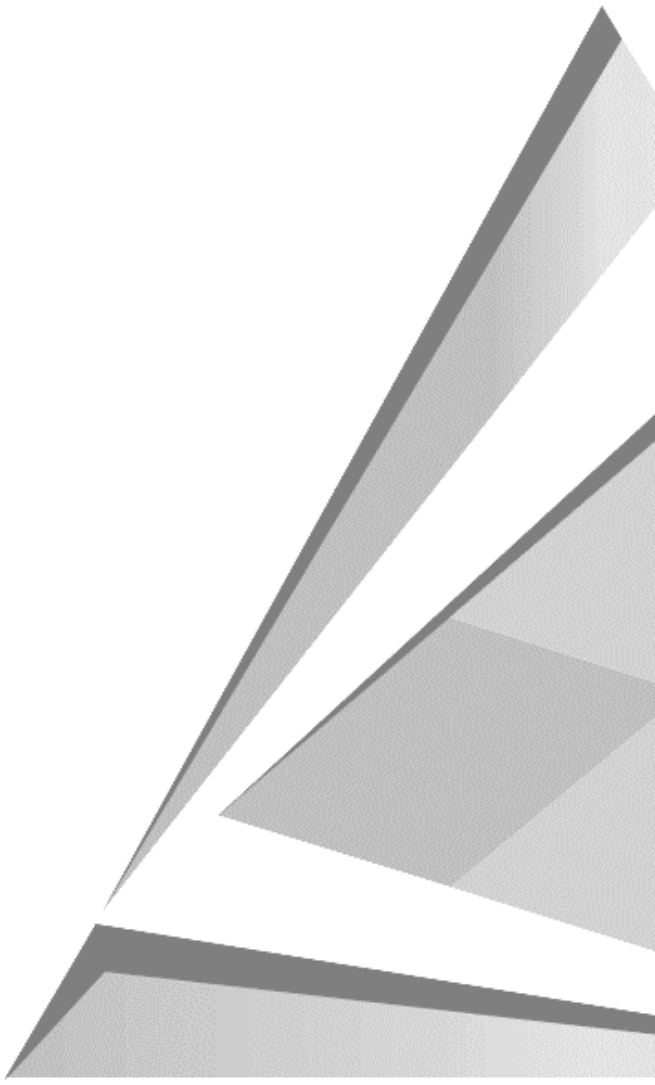
REV.	BY	DATE	COMMENT
A	SH	04/20	INITIAL DRAFT
B	SH	05/21	SUBMISSION
C	KB	11/21	ZONE CHANGE

TITLE

DRAFT WATER RETICULATION PLAN WITH ZONINGS

Drawing Name	Design_Draft vC.dwg /Water Supply	SUBJECT TO FINAL SURVEY	Rev.	C

APPENDIX E
SCHEDULE OF ASSOCIATED PARTIES



1 SCHEDULE OF AFFECTED PROPERTIES

Dated: 2/12/2020

Below is a table of all of the properties affected by the Proposed Plan Change.

PROPERTY ADDRESS	LEGAL DESCRIPTION	RT NUMBER	TITLE AREA	REGISTERED OWNER/S
240 Station Road	Lot 1 DP 443991	562724	28.2200ha	Auckland Trotting Club Incorporated
242 Station Road	Lot 1 DP 97787	NA53B/664	3.7343ha	
27 Yates Road	Lot 1 DP 62593	NA18A/1372	3.2501ha	
154 Golding Road	Lot 3 DP 437089	538420	4.1899ha	JF & SL Street Limited
156 Golding Road	Lot 1 DP 437089	538418	7.9905ha	JF & SL Street Limited
158 Golding Road*	Lot 2 DP 437089	538419	4.9797ha	Golding Meadow Developments Limited
162 Golding Road	Lot 5 DP 437089	538423	3.9053ha	JF & SL Street Limited
17 Royal Doulton Drive	Lot 9 DP 102609	NA56C/756	2.8814ha	Chak Cheng Michael Fu
25 Royal Doulton Drive	Lot 8 DP 102609	NA56C/755	6.1253ha	Shen & Zeng Investments Limited
27 Royal Doulton Drive	Lot 2 DP 147918	NA88A/334	2.7704ha	Shen Development Limited
27D Royal Doulton Drive				
27A Royal Doulton Drive	Lot 1 DP 147918	NA88A/333	2.1240ha	Taini Eruera Takahi Clarke as to a 1/3 share, Loncey Daniel Clarke as to a 1/3 share, Tristy Isabelle Thelma Clarke as to a 1/3 share

PROPERTY ADDRESS	LEGAL DESCRIPTION	RT NUMBER	TITLE AREA	REGISTERED OWNER/S
152 Golding Road	Lot 6 DP 437089	538423	4.516ha	YLH Holdings Limited
160 Golding Road*	Lot 4 DP 437089	539421	4.0593ha	Selina Lily Deadman
49 Yates Road*	Lot 6 Deeds Plan 70	NA18D/367	10.5496ha	Bloodstock Lodge Limited

***NOTE:** Part of the property is not within the extent of the Plan Change. This is not reflected in the title area identified above.