Wellington Water

South Wairarapa District Council Spatial Planning – Wellington Water Inputs

Our water, our future.

Document Details

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Contents

1. Introduction

1.1 Context

South Wairarapa District Council (SWDC) with support from Anderson Consulting have undertaken a spatial growth planning screening process (November 2020 to January 2021). This screening process involved a series of workshops reviewing potential growth scenarios against a set of criteria to prioritise these. SWDC requested Wellington Water Limited (WWL) provide three-water infrastructure (potable water supply, wastewater, stormwater) advice to support this process.

1.2 Purpose

This document summarises WWL's advice in assessing the three-water infrastructure criteria for each of the SWDC growth scenarios reviewed for townships (Martinborough, Greytown and Featherston) and hamlets with supporting evidence and references.

1.3 National Policy Statement – Urban Development (NPS-UD) (2020)

NPS-UD (2020) recognises that sufficient development capacity requires integrated and strategic planning and funding decisions over the medium and long term. Development capacity refers to the amount of development allowed by zoning and regulations in plans that are supported by infrastructure. NPS-UD (2020) requires that at any one time there is sufficient development capacity as defined in Table 1.

Table 1: NPS-UD Development Capacity Requirements

Timeframe	**Development Capacity**
Short-term (3 years)	Development capacity that is feasible, reasonably expected to be realised, zoned and serviced with development infrastructure.
Medium-term (3 to 10 years)	Development capacity that is feasible, reasonably expected to be realised, zoned and either: Serviced with development infrastructure, or the funding for the development infrastructure is identified in a Long Term Plan (LTP).
Long-term (10 to 30 years)	Development capacity must be feasible, identified in relevant plans and strategies, and associated development infrastructure identified in an Infrastructure Strategy.

Three-water infrastructure has been considered when assessing each of the growth scenarios.

1.4 Assumptions and Limitations

WWL's advice is based on existing information, previously published advice, studies and personnel experience. Further modelling, analysis and studies are recommended to qualify constraints, and identify solutions to enable proposed development areas to progress with adequate three-water infrastructure.

1.5 Population Forecasts

SWDC provided population growth forecasts as presented in Table 1, these have been used as the basis for WWL advice. It is understood that more refined population forecasts will be available as the spatial plan progresses and more definitive land area, density, and housing typologies are determined.

Table 2 – South Wairarapa Growth Forecasts (Infometrics, 2020)

Growth Forecasts for 3-towns			
Area	2019	2051	% Change
Featherston	2,615	3,489	33%
Greytown	2,595	3,674	42%
Martinborough	1,864	2,511	35%
Source: South Wairarapa Distribution Population (medium projection) (Infometrics, 2020)			

1.6 Interdependencies with other Matrix Criteria

SWDC are using a set of criteria to develop and assess potential growth areas. Table 3 shows interdependencies between three-waters (water supply, wastewater and stormwater) with other criteria being applied. These interdependencies highlight areas which may amplify constraints or opportunities and therefore require further consideration.

Table 3: Interdependencies with other Criteria

Criteria	*Interdependency with 3-Waters*	*Interdependencies*
Capacity to meet population growth	Strong	Ability to support population growth requires ongoing 3-waters planning, assessment and investment to support growth without adverse environmental effects.
Soil contamination	Medium	Potential contamination of water supply and reticulation.
Water Supply	Strong	Water source, treatment, storage and distribution.
Wastewater	Strong	Wastewater collection, conveyance and treatment.
Stormwater	Strong	Stormwater network, flooding controls, and water quality treatment devices.
Public Transport	Weak	N/A
Community Infrastructure	Weak	Incorporation of Water sensitive urban design in community infrastructure. Community infrastructure (e.g. schools, hospitals and aged care facilities) which provide for vulnerable community members require additional considerations especially for drinking water supply continuity.
Iwi views	Strong	Sustainable use of water, disposal of wastewater, management of waterway health.
Community views	Medium	Sustainable use of water, disposal of wastewater, management of waterway health.
Hazards (including liquefaction)	Medium	Damage to infrastructure and increased design standards.
Soil Class 1-2 (avoid)	Medium	Geotechnical requirements to support infrastructure design, increased inflow and infiltration in wastewater networks and soils drainage capacity
Roading	Medium	Stormwater requirements must be integrated with impervious areas, including roading. In addition, roading corridors are typically used for other utilities (e.g. water and wastewater pipes), integrated construction planning should be used to minimise costs or rework.
Other	As required.	

2. SWDC Growth Scenario Assessment - Three-Waters Infrastructure Criteria

2.1 Scoring Criteria Guidance

Table 4 summarises typical qualitative scoring criteria to assess each three-water infrastructure, for low (1), mid (3) and high (5). Given each growth scenario has unique geographical, topographical and spatial features these typical scoring criteria have been used as a guide, with specific aspects evaluated and presented in Table 5.

Table 4: Rating Table for Qualitative Spatial Planning Assessment of 3-Waters

Rating	**Water Supply**	**Wastewater**	**Stormwater**
Infrastructure	*Water source, treatment, storage and distribution.*	*Wastewater collection, conveyance and treatment.*	*Stormwater network, flooding controls, and water quality treatment devices.*
1 (low/poor)	• Major constraints on water source, storage or bulk network connection. • Major constraint of water source protection for existing water supply. • Water supply requires significant capital investment in infrastructure (e.g. new source, new WTP, new reservoirs etc.)	• Major constraints in wastewater servicing, e.g. Major trunkmain connection and/or pumping station required. • New WWTP required to meet growth in areas without connection to the existing wastewater treatment system (e.g. due to geographical location).	• Flooding has been identified from past experience or known issues.
3 (mid)	• Storage capacity does not meet existing levels of service, growth will exacerbate deficit. • Requires new water supply network, which may include new bulk water connection.	• New trunkmain required to connect to existing network. • Increase in capacity of existing WWTP.	• Stormwater can be reasonably managed using typical development controls and local infrastructure upgrades.
5 (high/very good)	• Serviced with development infrastructure: capacity is available to meet demand in all aspects of water source, treatment, storage and distribution.	• Serviced with development infrastructure: capacity is available to meet demand in all aspects of wastewater collection, conveyance and treatment.	• Serviced with development infrastructure: stormwater network, or suitable devices to demonstrate management of stormwater quantity and quality. • Flooding identified as very unlikely (e.g. topography, soils) or infrastructure already capable of managing expected impacts.

2.2 SWDC Growth Scenarios – Three Water Assessment

Wellington Water attended two SWDC Spatial Plan workshops in November and December 2020. The workshops were to assess the suitability of the identified areas for future growth in Martinborough, Featherston, and Greytown as shown in Attachment A.

In support of the overall process, to be completed by SWDC, Wellington Water is providing the following detail to capture the components that have contributed to the 3-water services assessment of the growth areas. Further modelling and analysis is required to confirm existing situation and requirements to service growth. These inputs should be considered only for purposes of early-stage screening and comparison purposes.

The final moderated scores resulting from the workshops can be found in SWDC's workshop report. Table 5 presents a summary of the three-water infrastructure assessment completed to support growth scenario screening. The scores included in the table below are provided here only for reference. Those highlighted in blue, refer to scores that differ from the moderated score, for the purposes of ease of reference.

Table 5: Summary of Three-Water Scores (1 Low/poor to 5 High/very good)

Option Assessed	Water Supply	Wastewater	Stormwater
Summary of general issues to cater for growth.	• Recent upgrades to WTP and reservoirs have provisioned for some growth. Further consideration of growth scenarios will need to be reviewed. • Consent application for combined Featherston/Greytown water take includes projected increase in population, from 5,222 (2019) to 6,708 (2043), in line with population projections. • Reducing consumption and leakage across district will be necessary to support increased demands. • Details of existing water supplies are shown in Attachment B.	• Inflow and infiltration is currently being addressed through renewals and other targeted activities. This will provide more WW network capacity.	• Water races exist • Existing overland flowpaths have limited protection
Martinborough			
General Comments	• Fire-flow constraints will require network capacity upgrades (to be determined based on modelling outputs).	• WW network will likely require upgraded capacity to avoid blockages and overflows. • WWTP capacities will need to be reviewed against new growth scenarios and consent limitations, currently sized ~2000 population.	• Protection of overland flow paths is required.
M 1. 48.8ha Martinborough South East Growth Area (MGSA) Includes Oxford St	WWL Score: 3 Considerations: 2 days water storage capacity Location of WTP highlighted for liquefaction and water quality risk Fireflow constraints exist requiring upgrades to water mains. High impact/low probability event for WTP could be impacted by Liquefaction Earthquake risks can build in mitigation measure e.g. requirement for greywater tanks for new developments	WWL Score: 3 Considerations: Servicing through WW trunk is an option Mitigation to increase capacity e.g. I&I management - capacity High risk for WWTP from liquefaction earthquake risks	WWL Score: 3 Considerations: Flooding in MGSA Perimeter diversion @ $3.5M upstream Pond $2.1M. Poorly drained soil (clay) & on-site solutions alternative Financial Contributions at plan change Updated flood model being produced will provide more detailed information.
M 2. 67.8 ha MGSA Extension includes Hawkins Drive	WWL Score: 2 Considerations: Greenfield area will require connection to water supply. Also see comments for M1 except connections are in M1 there are no connections in M2.	WWL Score: 3 Considerations: As mentioned above	WWL Score: 2 Considerations: Updated flood model being produced to identify overland flowpaths and identify flood mitigations.

Option Assessed	Water Supply	Wastewater	Stormwater
M 3. 46.1 ha Lake Ferry Rd (South) & White Rock Development Area	WWL Score: 2 Considerations: M3 same as M2. M1 has some network extension requirements.	WWL Score:3 Considerations: WWTP issues as mentioned above. There is no wastewater network servicing this area at present.	WWL Score:2 Considerations: As above, no cost information currently available. Area likely to be outside model area
M 4. (251 lots) Status quo Infill development in existing urban area on sites> 1200m2	WWL Score: 4 Considerations: can use existing spare capacity.	WWL Score: 5 Considerations: capacity for existing lots in network based on 25% of the potential lots already being subdivided.	WWL Score: 4 Considerations: Onsite soakage to manage stormwater flooding.
M 5. (71 Lots) Intensification (increased option for density on sites of 961m2) increased around adjoining existing commercial/retail with design guide	WWL Score: 4 Considerations: infill development, with existing water supply.	WWL Score: 5 Considerations: capacity for existing lots based on 25% uptake.	WWL Score: 4 Considerations: Onsite soakage
M 6. Other (e.g. a combination of options 1,4&5)	WWL Score: 3 Considerations: as mentioned above in each of the individual scenarios	WWL Score: 3-4 Considerations: as mentioned above in each of the individual scenarios. M1 scenario brings score closer to 3.	WWL Score: 3 Considerations: as mentioned above in each of the individual scenarios
Greytown			
General Comments	• New water mains and reticulation will be required to service Greenfield areas (and pressure constraints at Woodside will need to be addressed). • Fire-flow constraints will require network capacity upgrades (to be determined based on modelling outputs).	• WW network will likely require upgraded capacity to avoid blockages and overflows. • New WW mains and reticulation to service Greenfield areas (e.g. Woodside). • WWTP capacities to be reviewed against growth scenarios and consent limitations, currently sized ~2800 population.	
G 1. 133.6 ha Junction Road Extension	WWL Score: 3 Considerations: Principle of costs for greenfield	WWL Score: 2 Considerations: Some available servicing. Existing constraints/ blockages. Higher cost associated with greenfield area servicing. Capacity in WWTP needs to be increased.	WWL Score: 4 Considerations: Gravels allowing for improved dissipation of stormwater via existing water races. Limited information available.
G 2.104.6 ha Market Road Extension Development Area	WWL Score: 3 Considerations: WTP at Memorial Park, require new water connections. Start of Papawai stream – Iwi views	WWL Score: 2 Considerations: On wastewater main to WWTP, however, extension will be required. Start of Papawai stream – Iwi views	WWL Score: 3 Considerations: Springfed stream and high groundwater table. View of Iwi – Papawai stream starts there and flows past Papawai marae (site of first Māori parliament).

Option Assessed	Water Supply	Wastewater	Stormwater
G 3. 33.8 ha North Street Area	WWL Score: 3 Considerations: WTP at Memorial Park; can supply because network in close proximity Within source protection zone – unknown risks for water quality need to be assessed.	WWL Score: 3 Considerations: New extension and likely to be pumped. Capacity constraint for downstream main	WWL Score: 2 Considerations: Groundwater high, and flood management required. Water races provide opportunity for Stormwater mitigation
G 4. 313.4 ha Woodside Station Junction (New Town –GWRF-500 new dwellings)	WWL Score: 3 Considerations: New storage required. Closer to WTP, less km of piping, Waiohine. WTP serves Featherston 490 capacity	WWL Score: 2: Considerations: No wastewater network, gravity to WWTP or decentralised WW. WWTP other wide town (2800). Affordability/constraints more population. Upgrade capacity plus cost of piping ↑costs	WWL Score: 4: Considerations: Gravels allowing for improved dissipation of stormwater.
G 5. 37.6. ha Greytown Corridor to Woodside Station	WWL Score: 3 Considerations: Proximity to existing water main	WWL Score: 2 Considerations: Pipe or onsite disposal	WWL Score: 4 Considerations: onsite stormwater Gravels allowing for improved dissipation of stormwater. Water races provide overland flow paths.
G 6. Existing zoning	WWL Score: 3 Considerations: fireflow constraints need to be addressed.	WWL Score: 4 Considerations: upgrading wastewater pipe at present.	WWL Score: 4 Considerations: Gravels allowing for improved dissipation of stormwater.
Featherston			
General Comments	• Modelling outputs will inform any network constraints and subsequent upgrades.	• WWTP/network sized for ~5000 population, room available for future growth. • Currently WWTP is not acceptable solution to meet water quality discharges. However there are affordability constraints that need to be considered. • Consent renewal ongoing	• TBC, however 2019 event estimated >1% event didn't cause any habitable homes to be flooded. • Harrison St flood embankment sized for 2% event in 1990s.
F 1. 314.1 ha Featherston Growth Node Development (as per GWRC Framework-1882 new dwellings)	WWL Score: 3 Considerations: Capacity similar to Greytown.	WWL Score: 2 Considerations: Consents renewal needed. New wastewater system, requiring high costs to improve quality of discharge.	WWL Score: 3 Considerations: Soakage pits on-site. Water off hills, some remedial work needed for some intersections. Runoff quicker than Greytown
F 2. 117.5 Featherston South	WWL Score: 2 Considerations: New network required. Currently serviced by bore water.	WWL Score: 2 Considerations: no existing network services; currently serviced by septic tanks.	WWL Score: 2 Considerations: Overland flow paths. Donald's Creek Flood zone
F 3. 799 lots Status Quo Existing Zoning	WWL Score: 3 Considerations: Capacity similar Greytown	WWL Score: 3 Considerations: wastewater treatment quality still an issue Consents renewal needed. New wastewater system, requiring high costs to improve quality of discharge.	WWL Score: 2 Considerations: Soakage pits on-site. Water off hills, some remedial work needed for some intersections. Runoff quicker than Greytown

Hamlets

Option Assessed	Water Supply	Wastewater	Stormwater	Comments
Pirinoa				
	WWL Score: 4 Considerations: Existing water supply, WTP & storage.	WWL Score: 3 Considerations: On-site septic. ~1000m2 required for disposal fields. Potential compliance issues.	WWL Score: 5 Considerations: no known risks	
Kahutara				
	WWL Score: 3 Considerations: No water Supply. Tank UV systems. $3000/tank	WWL Score: 2 Considerations: As above – high water table	WWL Score: 4 Considerations: Higher water table in winter time. Water logged	
Tauherenikau				
Approx. 4km from Featherston and 8km from Greytown	WWL Score: 3 Considerations: As above	WWL Score: 3 Considerations: As above – high water table	WWL Score: 5 Considerations: Good drainage	Proximity to existing network in Featherston and Greytown
Ngawi				
	WWL Score: 2 Considerations: Dryer climate. Salt build-up. Supply options limited.	WWL Score: 1 Considerations: No wastewater reticulation. No absorption, with shallow top soil - discharge to coast	WWL Score: 1 Considerations: Water chopping land (soil)	
Lake Ferry				
	WWL Score: 2 Considerations: Near sea. Currently supplied by rainwater tanks, with lower rainfall. Supply options limited.	WWL Score: 5 Considerations: existing system with area available to expand	WWL Score: 2 Considerations: some drainage, proximity to Lake Onoke known to flood some areas	

SWDC Notes: The preferred approach is a combination option (M6) to accommodate population growth that would include:

- Martinborough South East Growth Area -MSGA (Greenfield -rural/lifestyle land being converted to urban - on land contiguous to the existing urban area with easy accessibility to the town centre)-labelled M1 on the map
- Some intensification of the existing residential area in close proximity to the town centre/existing commercial shops and village; (labelled M5) on the map; and
- Uptake of infill development currently allowed in the existing residential zone (labelled M4).

3. References

1. South Wairarapa District Council (SWDC). (August 2019). Featherston/Greytown Public Water Supply Consent Renewal – Background Document. Accessed at: https://woogle.wellingtonwater.co.nz/site/wsrc/_layouts/15/WopiFrame.aspx?sourcedoc=/site/wsrc/active/Waiohine%20Wellfield/Featherston%20water%20supply%20consent%20renewal_v05.pdf&action=default

2. Greytown Featherston Martinborough Schematic.pdf

3. Wastewater Networks (AWA Wastewater Model Calibration Report, 2019)

Attachment A: Growth Scenario and 3W GIS Maps

A.1 MARTINBOROUGH

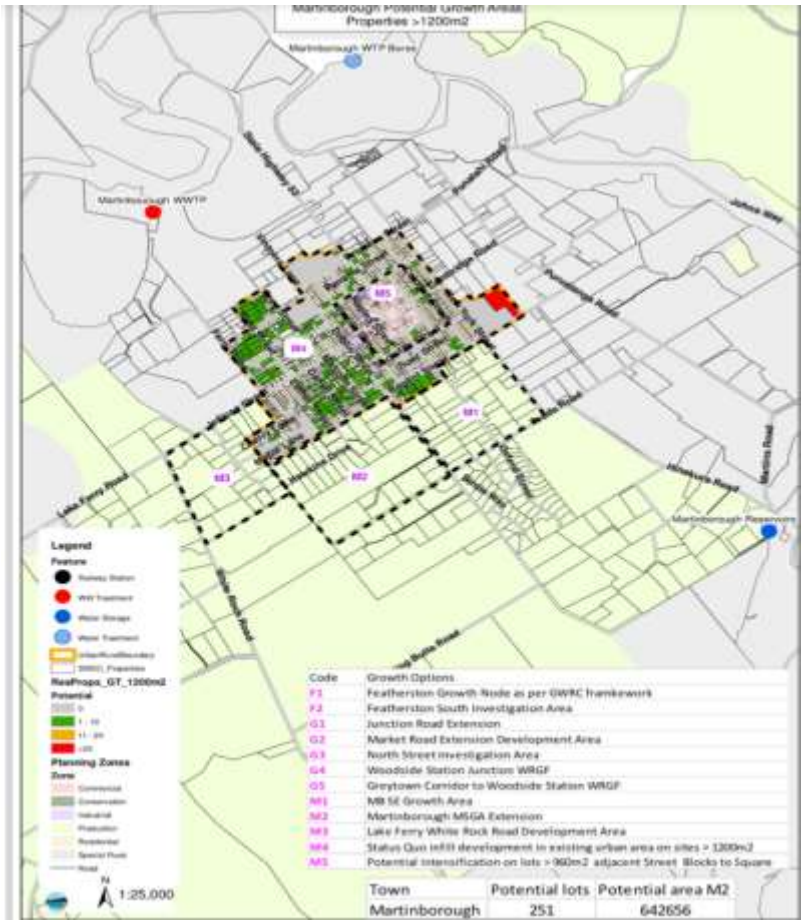


Figure A.1.1: Martinborough Growth Scenarios Map (SWDC, 2020)

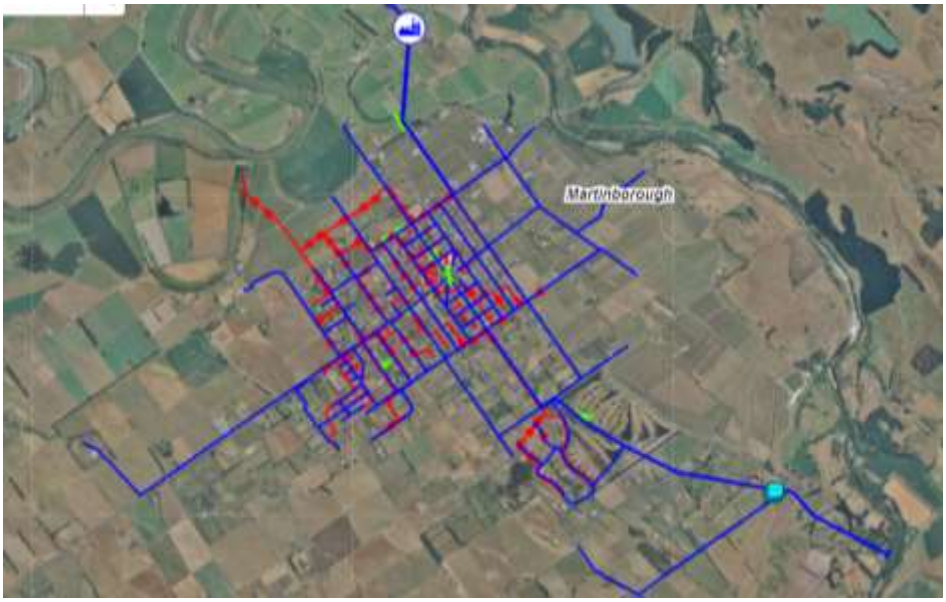


Figure A.1.2: Martinborough 3-Waters Infrastructure (WWL GIS, 2020)

A.2 GREYTOWN

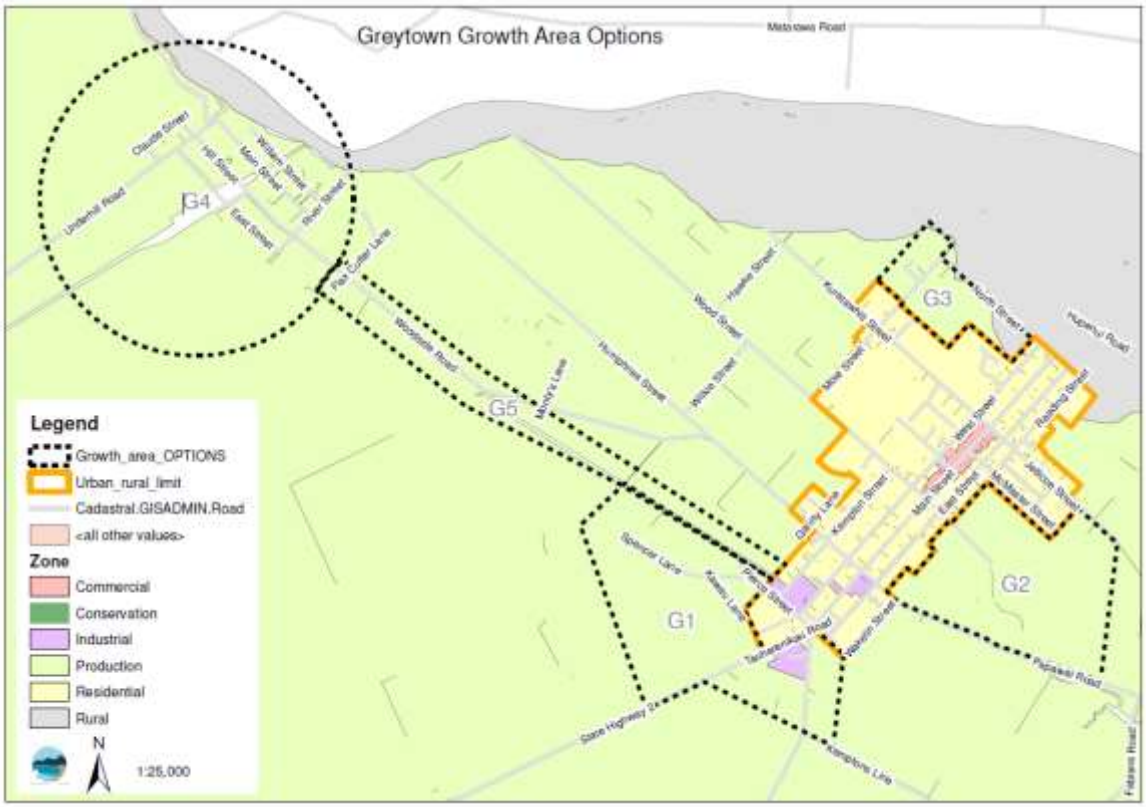


Figure A.2.1: Greytown Growth Scenarios Map (SWDC, 2020)

Figure A.2.2: Greytown 3-Waters Infrastructure (WWL GIS, 2020)

A.3 FEATHERSTON

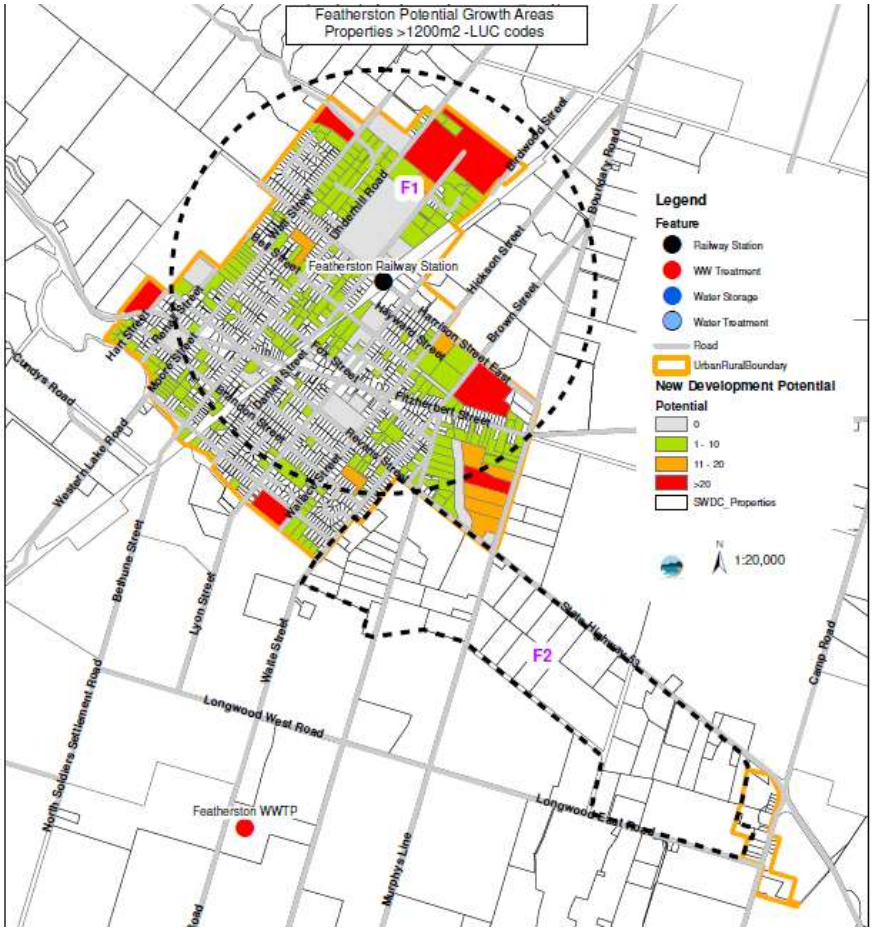


Figure A.3.1: Featherston Growth Scenarios Map (SWDC, 2020)

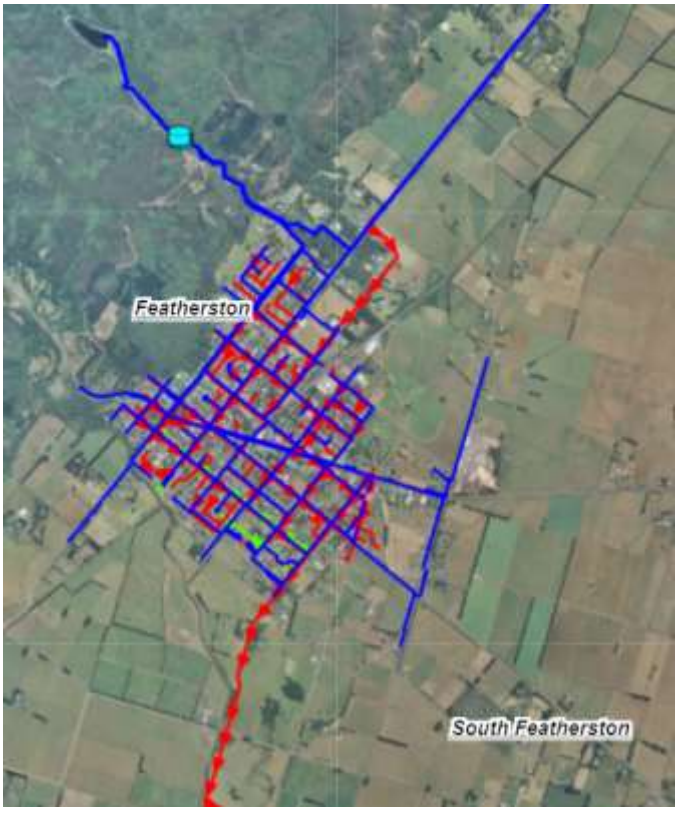


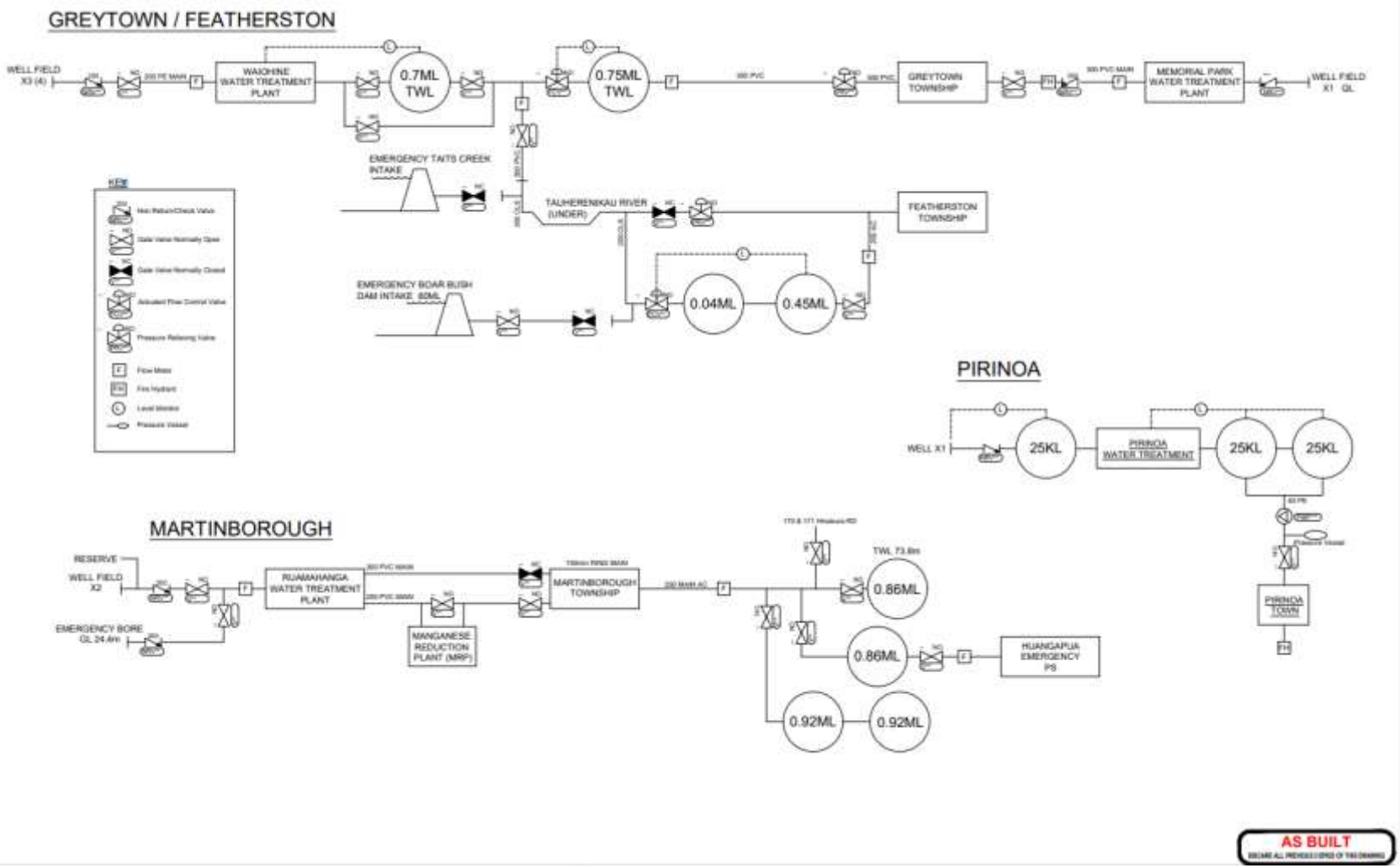
Figure A.3.2: Featherston 3-Waters Infrastructure (WWL GIS, 2020)

Attachment B - Water Supply Infrastructure

Water Supply Infrastructure

To supply water to communities within South Wairarapa, water is sourced from surface water and groundwater, treated at a number of water treatment plants located around the district and stored in local reservoirs. The table and schematic below show this configuration.

Summary of Water Treatment Plants (WTP):		
Greytown/Featherston	Waiohine WTP	• Currently produce up to 28 L/s from three bores, with a fourth bore being installed that will increase production by up to 20 L/s (total of 46 L/s)
Greytown	Memorial Park WTP	• Single bore limited to 32 L/s
Martinborough	Martinborough (Ruamahanga) WTP	• Currently limited to 19 L/s production, however commissioning of the new Manganese Treatment Plant will increase capacity.
Pirinoa	Pirinoa WTP	• Small plant, limited to 1 L/s production



Source: [Greytown Featherston Martinborough Schematic.pdf](#).

Attachment C - Wastewater Networks (AWA Wastewater Model Calibration Report, 2019)

Martinborough wastewater catchment

The Martinborough catchment is detailed in Figure 3, below. Flows are conveyed from the town to an oxidation pond in the north west of the catchment. From here, there is an outfall pipe to the nearby Ruamahanga River. Figure 3 provides an overview of the catchment extent and modelled network.

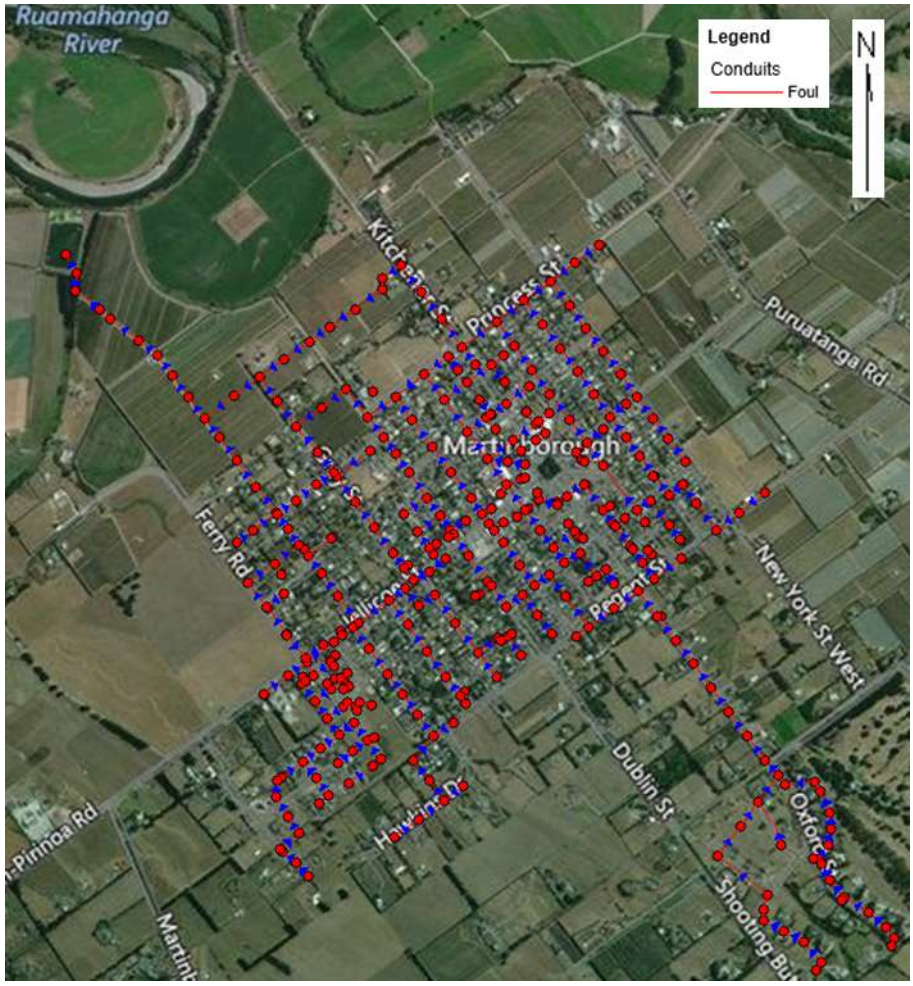


Figure 3 Martinborough Catchment Plan

The Martinborough catchment is located in a relatively flat expanse of land surrounded by hills in the east and west. Overall the catchment is approximately 3.4km^2 (340 ha) in size and the wastewater network serves an estimated population of 1,637 from the 2013 Census.

Martinborough is a small town approximately 65km east of Wellington. It has a number of smaller commercial businesses within the town centre and a number of vineyards outside the town centre. The town has a number of tourism related businesses and sees visitors throughout the year. All of the sewers within the catchment are relatively small, with diameters between 150mm and 200mm.

The Martinborough catchment does not contain any pumping stations or combined sewer overflows.

Greytown wastewater catchment

The Greytown catchment is detailed in Figure 4 below which provides an overview of the catchment extent and modelled network. Flows are conveyed from the town via a gravity system to an oxidation pond system in the south east of the catchment. From here there is an outfall pipe to the nearby Papawai Stream which leads to the Ruamahanga River.

Figure 4 Greytown Catchment Plan

The Greytown catchment is located in a relatively flat expanse of land approximately 7km south east of the Remutaka Range. Overall the catchment is approximately 5.5km^2 (550 ha) in size and the wastewater network serves an estimated population of 2,199 people according to the 2013 Census.

Greytown is a small town approximately 75km north east of Wellington. It has a number of smaller commercial businesses within the town centre, a commercial zone to the south of the town centre, two orchards outside the town centre and one industrial trade type to the south of the town also. All of the sewers within the catchment are relatively small, with diameters of 225mm or below.

The Greytown catchment contains seven pumping stations. No combined sewer overflows are present. The network within the catchment has been modelled using the Wellington Water records, LiDAR data, as-built data and surveys contained in the record data provided (three surveys).

Featherston wastewater catchment

The Featherston catchment is detailed in Figure 5, below. Flows are conveyed from the town to an oxidation pond in the south of the catchment. From here there is an outfall pipe to the nearby Donald's Creek. Figure 5 provides an overview of the catchment extent and modelled network.

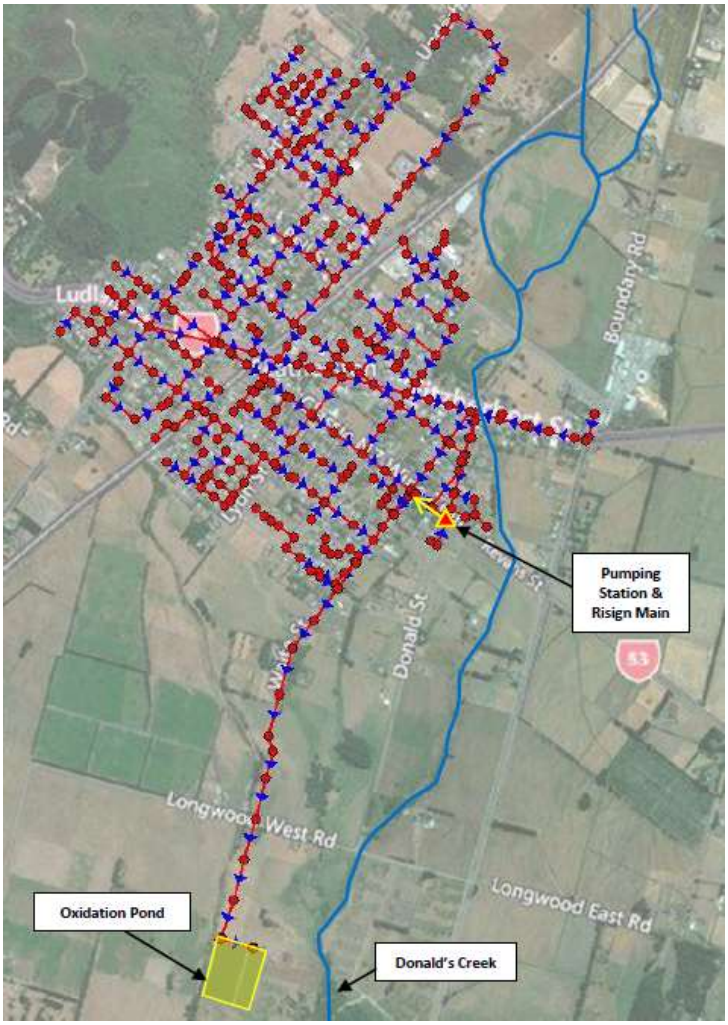


Figure 5: Featherston Catchment Plan

The Featherston catchment is located in a relatively flat expanse of land in the foothills of Remutaka Range, a hilly area to the north west of Featherston. Overall the catchment is approximately 2.2km^2 (220 ha) in size and the wastewater network serves an estimated population of approximately 2,500 from the 2013 Census.

Featherston is a small town approximately 63km north-east of Wellington. It has a number of smaller commercial businesses within the town centre and dry industries outside the town centre. All of the sewers within the catchment are relatively small, with diameters between 150mm and 375mm.

The Featherston catchment contains one pumping station and there are no combined sewer overflows on the network.

Soil Class

Soil Class is used by the runoff volume model in defining how wet the surface soil is at the start of each storm event. The Soil Class determines how well drained a soil is and how quickly it dries. The wetter the soil is the more runoff that will occur. Table 15 describes the soil class categories as described by the Wallingford Procedure.

The Martinborough and Greytown catchments lie on soil classes 2 and 3 while the Featherston catchment lies on soil classes 2 and 5. These have been applied appropriately within each model.

Table 6 Soil Class Descriptions

Soil Class	General Description of Map Units
1	• Well drained permeable sandy or loamy soils and shallower analogues over highly permeable limestone, chalk, sandstone or related drifts. • Earthy peak soils drained by dikes and pumps • Less Permeable loamy over clayey soils on plateaux adjacent to very permeable soils in valleys
2	• Very permeable soils with shallow ground water • Permeable soils over rock or fragipan, associated with smaller areas of less permeable wet soils • Moderate permeable soils, some with slowly permeable sub-soils.
3	• Relatively impermeable soils in boulder and sedimentary clays, and in alluvium. • Permeable soils with shallow ground-water in low lying areas. • Mixed areas of permeable and impermeable soils in approximately equal proportions
4	• Clayey or loamy over clayey soils with an impermeable layer at shallow depth/
5	• Soils of the wet uplands • With peaty or humose surface horizons and impermeable layers at shallow depth, • Deep raw peat associated with gentle upland slopes or basin sites • Base rock cliffs and screes and • Shallow, permeable rocky soils on steep slopes