Proposed Plan Change C: Kakatangiata

Stage 1: Kikiwhenua Residential Area

Water & Wastewater Servicing Assessment
This document was prepared by Palmerston North City Council, City Networks, Water and Waste Services Division.

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1 Scope

This brief report sets out the findings of an assessment of water supply and wastewater servicing requirements for the proposed Kikiwhenua Residential Area. The assessment has been undertaken using the preliminary development plan information provided by the developer in the context of the Palmerston North City Council’s proposed Kakatangiata Residential Growth Area.

The proposed Plan Change area is roughly a 24 hectare block bounded by Te Wanaka Road, the Mangaone Stream and State Highway 56. The specific area covered by this assessment is outlined in blue.

Figure 2: Scope of the Plan Change Area
2 Wastewater Services Assessment

2.1 Existing Wastewater Services

The existing wastewater network in the vicinity of Te Wanaka Road is depicted in Figure 3 below and comprises a number of local gravity networks which drain to local pump stations at Grand Oaks, Racecourse and Te Wanaka.

![Figure 3: Existing Wastewater Network in the Vicinity of Te Wanaka Road](image)

There are currently 10 dwellings on Te Wanaka Road which receive reticulated wastewater services comprising a 150mm diameter gravity main draining to the Te Wanaka wastewater pump station (WWPS) which then pumps to Lane Place via a 63mm diameter MDPE pumping main (blue line in Figure 3).

2.2 Proposed Wastewater Servicing

Geotechnical investigations and assessments completed as part of preliminary work to determine the suitability of the Kakatangiita residential growth area, identified the area to be moderately susceptible to earthquake liquefaction. The liquefaction risk areas are also characterised by heavier poorer draining soils which are a significant factor in the poor performance of existing on-site wastewater systems in the Te Wanaka Road area. Poor drainage also typically increases the risk and extent of stormwater inflow and infiltration to traditional gravity networks resulting in high peak wet weather flows in traditional gravity sewer networks.

The low ground elevations (RL 22-24m) in the proposed Plan Change area will require pump lift stations to be provided if traditional gravity wastewater networks are constructed. The existing Te Wanaka Road gravity and pumping system is constrained and cannot provide wastewater services for the proposed re-zone area which has the potential to be developed into over 200 residential lots.

Taking into account the above constraints PNCC have commissioned an assessment of the options for wastewater servicing for both the Kikiwhenua Residential Area and the wider Kakatangiita Growth Area. This assessment considered a wide range of factors including resilience to earthquake
liquefaction, capital and operating costs and the susceptibility to significant stormwater inflow and infiltration. The assessment identified that the most resilient and cost effective servicing option for both areas is a pressure sewer system. Key advantages of pressure sewer include the:

- Superior resilience of welded small diameter pipelines
- Flexibility to stage infrastructure investment
- Additional storage provided which can be used to minimise discharges to the network during wet weather peak events
- Lower capital cost overall and significantly lower staging costs for developers

Based on the findings of the assessment, Officers consider that a pressure sewer system provides the greatest resilience and is the most cost effective option for providing wastewater servicing of the Plan Change area.

In a typical pressure sewer system, each residential lot is fitted with a small pump chamber fitted with a grinder pump that receives the wastewater from the property. Sewage is then macerated and pumped via a small diameter pipe into a common pressure sewer main in the street. This pressure sewer network then delivers the sewage either to:

- a suitable connection point in the existing wastewater network, or
- directly to the wastewater treatment plant.

To ensure that the benefits of a pressure sewer network is achieved, Council will establish the Te Wanaka zone and the wider Kakatan giata zone (when established) as a pressure sewer servicing area. This will require Council to develop and define the following as a minimum:

- Designation or determination of specific pressure sewer service areas within the Wastewater Bylaw or District Plan (or both)
- Council adoption of a Pressure Sewer Policy which sets out obligations and responsibilities of property owners and Council
- Determination of whether a specific rating policy for pressure sewer system is required
- Adoption of a standard specification for pressure sewer systems including approval of a limited number of brands/models of pressure sewer pump installation
- Migration of existing serviced properties on Te Wanaka Road onto the new pressure sewer system to ensure an ongoing level of sewer service to, and effects on, these properties equivalent to that they receive now.

It is envisaged that Council will take responsibility for the on-going maintenance of the pressure sewer pump installations with the property owner signing up to a duty of care.

### 2.3 Proposed Wastewater Network

Modelling and detailed assessment has been undertaken of the pressure sewer system network required to serve both the Kikiwhenua Residential Area and the wider Kakatangiata growth area. This
has identified several options for the trunk services including a single 230mm main or dual 150mm mains.

Wastewater servicing of the Kikiwhenua Residential Area is assessed to require a 150mm trunk main in Te Wanaka Road connecting to local collector pressure sewers (63mm to 100mm) laid within the internal roading network of the sub-division development. The developer will be expected to fund their portion of the trunk sewer (based on capacity consumed) and the entire internal pressure sewer system.

The network assessment has identified the most efficient alignment for the trunk sewer to comprise a Te Wanaka Road with a crossing of the Mangaone Stream onto the property of Manawatu Racing Club, and then discharging to the 225mm diameter gravity main at the Totara Road Wastewater Treatment Plant. Figure 4 below depicts two possible alignments for the sewer trunk mains from the Te Wanaka Road development to the WWTP.

![Figure 4: Alignment Options for pressure sewer trunk mains across Manawatu Racecourse](image)

The indicative routes are direct, minimising capital cost and reducing the severity of any potential septicity issue in the earlier stages of development. Disruption to Manawatu Racecourse operations and facilities associated with the direct pipe alignments can be minimised by the use of trenchless technology such as directional drilling. Council would be seeking an easement over any pipeline. In addition Council would take the opportunity to install dual pipelines to cater for the future development of the entire Kakatangiata zone.
2.4 Funding

Council has approved programmes in the 2018-28 LTP for funding of new water, wastewater and stormwater infrastructure in the Kikitangata area in anticipation of re-zoning occurring within the period of the LTP. Programme 1055 – Urban Growth – Kikitangata – Installation of Wastewater Systems has provided for the following levels of funding for wastewater infrastructure.

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The funding allocation was made with provision for servicing of the Kikiwhenua Residential Area. Initial funding in 2018/19 is for detailed design work, with funding in 2020/21 intended to provide for funding Council’s portion of the cost of bulk sewer infrastructure. The timing of funding requirements will be dependent on progress with any plan change. An additional element to be funded from this programme will be installation of a pressure sewer system on-property equipment in each of the existing 10 properties in Te Wanaka Road currently serviced by the gravity network which will be disestablished.

3 Water Supply Services Assessment

3.1 Existing Water Supply

Te Wanaka Road is currently not serviced by public water supply. The nearest connections are an existing 150mm diameter pipeline on Pioneer Highway (840m), or the 225 diameter pipeline at the intersection of Maxwell Line and Pioneer Highway (1020m). The 150mm diameter pipeline in Grand Oaks Drive offers a loop connection to the southern end of Te Wanaka Road. Figure 5 below shows the extent of the existing water network in the vicinity of Te Wanaka Road.
3.2 Water Supply Servicing Assessment

Palmerston North City Council’s (PNCC) current level of service (LoS) for residential water supply comprises:

- A minimum service pressure of 350kPa or 35m of water pressure
- A minimum peak flow capacity of 25L/s for fire-fighting with a minimum residual pressure of 10m delivered from 2 hydrants within 135m of the specific property.

Hydraulic water network modelling was used to determine the network required to deliver the LoS for the proposed residential plan change area at Te Wanaka Road. This identified that the minimum water infrastructure required for servicing this area will comprise:

- 1020m of 200mm diameter pipeline on Pioneer Highway connecting to the existing 300mm diameter pipe at Maxwells Line intersection.
- 965m of 150mm diameter pipeline along Te Wanaka Road and crossing the Mangaone Stream to connect to the existing 150mm diameter pipe at Grand Oaks Drive.

Figure 6 below depicts the upgraded water network.
This network layout by providing connections to both Pioneer Highway and Grand Oaks Drive provides resilience by way of two sources of supply. The connection to Grand Oaks Drive can be achieved by way of a new road bridge or by using the existing bridge owned by Manawatu Racecourse Ltd which will require an assessed assessment for structural adequacy prior to any construction work.

Council expects the developer to fund 100% of this infrastructure to meet the requirements of the subdivision.

### 3.3 Future Water Supply Requirements in Kakatangiata

To cater for the full planned residential development in the Kakatangiata growth area as outlined in Figure 2, Council has provided for construction of a new bore once significant subdivision has occurred following the re-zoning of Kakatangiata. While the exact location for the bore has yet to be confirmed the most efficient location is assessed to be in the vicinity of the Pioneer Highway and Te Wanaka Road junction.

Council is interested to acquire a land parcel either as part of the Kikiwhenua Residential Area or on adjacent land for installation of the bore, a reservoir and pumping equipment. While the Kikiwhenua...
Residential Area can be serviced for water without the need for a new bore and reservoir, it will be required to service the full residential subdivision of Kakatangiata.

To ensure both the efficient delivery of this new bore supply to the city water network and to meet the water supply LoS requirements for the wider Kakatangiata Growth Area Council has assessed the trunk network needs to provide for:

- A 300mm diameter pipe along Pioneer Highway connecting to the existing 300mm diameter pipeline at Maxwell Line intersection
- A 200mm diameter main in Te Wanaka Road from Pioneer Highway to Grand Oaks Drive

Council has made provision to fund the cost of upsizing the mains from the 200mm and 150mm mains required to service the Kikiwhenua Residential Area.

### 3.4 Funding

Council has approved programmes in the 2018-28 LTP for funding of new water, wastewater and stormwater infrastructure in the Kakatangiata area in anticipation of re-zoning occurring within the period of the LTP. Programme 1170 – Urban Growth – Kakatangiata – Installation of Water Supply Systems has provided for the following levels of funding for wastewater water supply infrastructure.

**Table 2: Programme 1170 – 2018-28 LTP Funding**

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The funding allocation was made with provision for servicing of the Kikiwhenua Residential Area with some initial funding in 2019/20 to fund mains upgrades in Pioneer Highway and Te Wanaka Road. The timing of funding requirements will be dependent on progress with any plan change. If required Council funding provisions may need to be brought forward.
4 Summary

An assessment of both water and wastewater servicing requirements for the proposed Kikiwhenua Residential Area has been completed. This has included a detailed assessment by way of network modelling for both water supply and pressure sewer servicing. The assessment has confirmed:

- For both water supply and wastewater servicing cost efficient servicing options for the Kikiwhenua Residential Area are available which are consistent with longer term servicing of the Kakatangiata Growth Area.

- The trunk infrastructure required to service the Kikiwhenua Residential Area has been identified. It is Council’s expectation that this infrastructure will be funded by the developer.

- Council has funding in confirmed LTP programmes within the next 2 to 3 years to fund the upsizing of both trunk water and wastewater services to provide for future growth.

- The preferred option for wastewater servicing is a pressure sewer system with the trunk main taking an alignment across Racecourse land.

- Kikiwhenua Residential Area will be required to be designated as a Pressure Sewer Area for wastewater servicing.

- Provision as part of the re-zone of a land parcel for sale to Council for locating a bore, reservoir and pumping station is also a key requirement.