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WHANGAREI DISTRICT COUNCIL

Memorandum

To	Robert Burgoyne
From	Casper Kandori
Copies	Andrew Carvell Gemma Sands
Subject	**Langs Cove-Waipu Cove Wastewater Capacity**
Date	13 July 2017
Ref	

Introduction

WDC Waste & Drainage have been requested to comment on wastewater capacity within Langs Beach-Waipu Cove wastewater system in relation to the proposed plan change in Langs Cove and Waipu Cove.

This memo has been updated following discussion and review of the VK's Feasibility Assessment Report for Langs Beach-Waipu Cove wastewater reticulation (2008). The VK report recommendations have been considered against factors not available at the time the report was written, namely:

- Recorded flows from the catchments into the Waipu Wastewater Treatment Plant;
- Flow per average household or dwelling based on recorded flows and properties currently connected to the wastewater system;
- Assessment of wastewater flow from the campground, considering flow data available from the Ruakaka campground and water use records;
- Changes in sewer system technology, such as pressure sewer systems (not specifically assessed);
- WDC's experiences in operating the network.

Detailed review calculations are provided in the "Langs Beach-Waipu Cove Capacity Review-July 2017" MS Excel file WASWAT-37429923-164.

The Wastewater network

An over view of the wastewater network is provided in Figure 1&2.

Figure 1: Overview of Langs Cove-Waipu Cove Wastewater Network

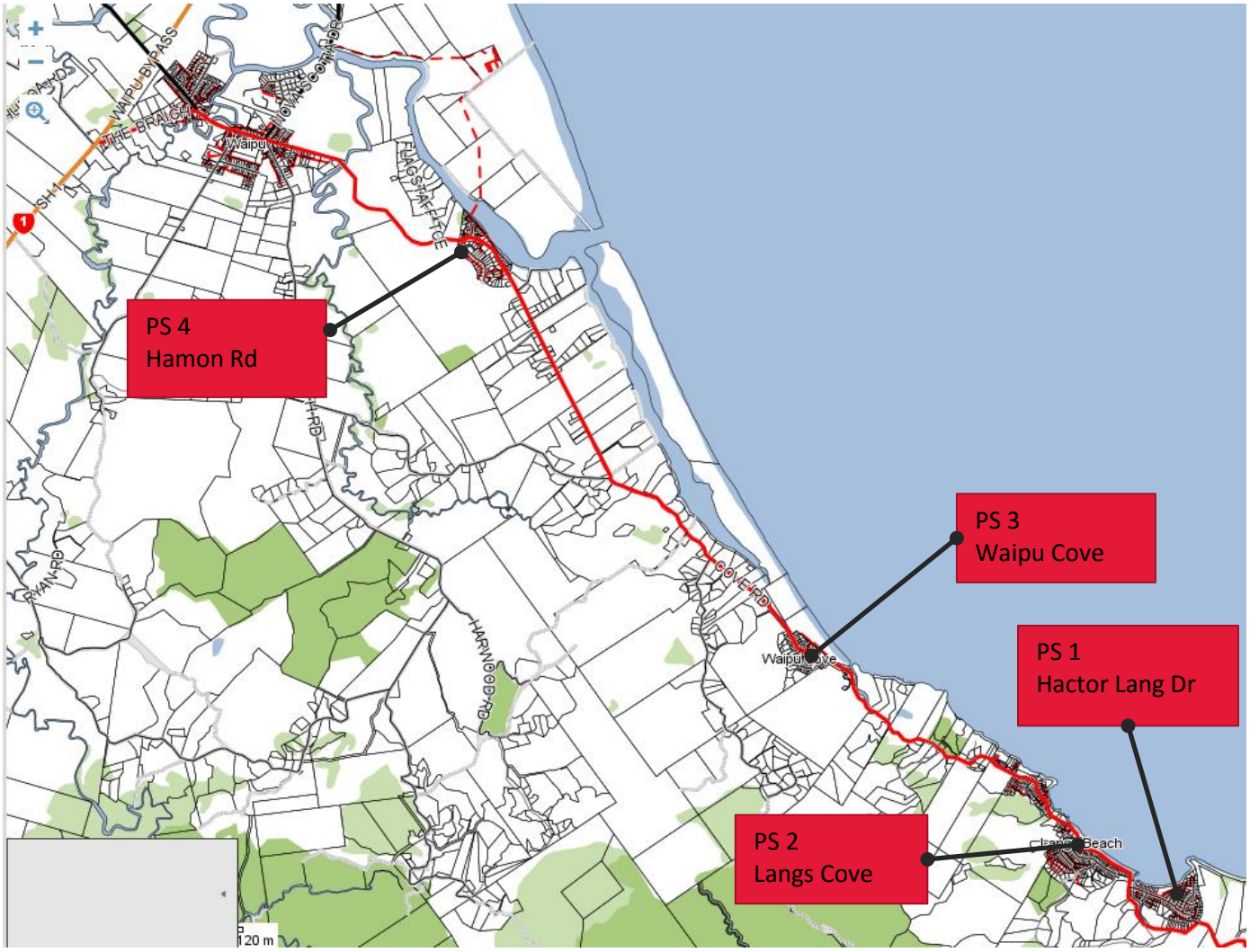
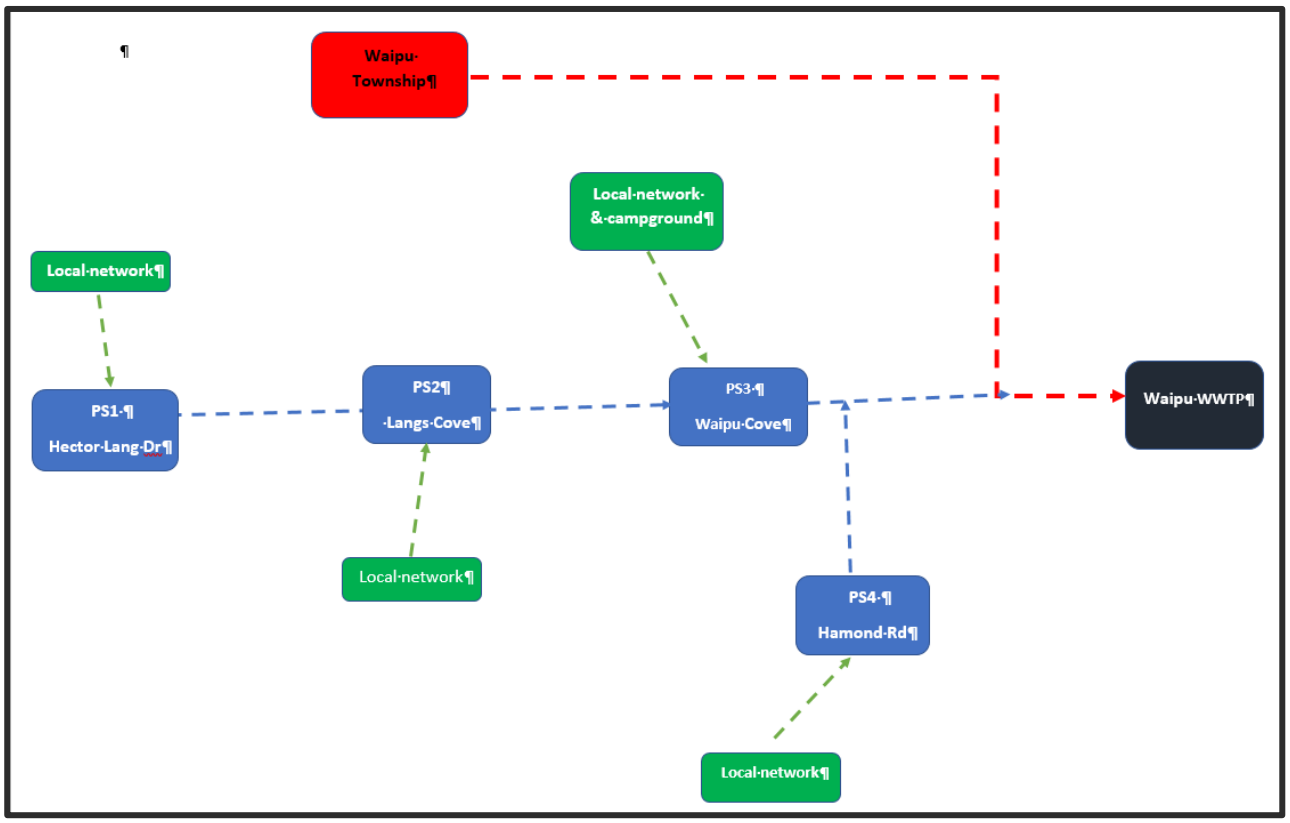


Figure 2: Schematic Overview of Langs Cove-Waipu Cove Wastewater Network



The key factors with regard to capacity include:

- The ability of the reticulation to convey wastewater from properties to pump stations;
- The capacity of the pump station to pump flow from catchments to the wastewater treatment plant;
- The capacity of the treatment plant to treat the wastewater.

Assessment of current use against capacity

The sewer network servicing the Waipu Cove and Langs Cove areas can be split into four catchments serviced by pump stations:

PS1: Hector Lang Dr
PS 2: Langs Cove (pumpstation located at Langs Bridge)
PS3: Waipu Cove
PS4: Hamon Rd (including Seascape development)

The wastewater treatment plant services all the above catchments and Waipu township.

The current demand and assessment of existing capacity is provided in Table 1. Table 2 sets out the key assumptions and where these vary in relation to the VK report.

Table 1 Existing capacity and current demand

	Existing Capacity		Current Demand	
	Flow (L/s)	Equivalent number of household connections	Flow (L/s)	Equivalent number of household connections
PS1 (Hector Lang Dr)	10.4	388	4.5	166
PS2 (Langs Bridge)	21.3	794	12.3	460
PS3 (Waipu Cove)	31.7	1182	17.7	659
PS4 (Hamon Rd-discharges into PS3 rising main)	15	559	2.5	95
Total		1741		754

Table 2 Assumptions used in assessing demand compared to the VK report

Factor	Assumption used	VK report
Flow generated by a single household	ADWF of 434 L/d [1]	ADWF of 800L/d (as per EES)
Campground	103 average households	150 average households
Peaking factor	5.4 [1]	5 (as per EES)
Pressure sewer flow	Not allowed for in the analysis but this will reduce the peaking factor	Not considered

Note 1: Based on flow records and/or number of dwellings and properties connected.

Capacity assessment for future growth Langs Cove-Waipu Cove Reticulation

Reticulation and pump stations

Table 3 sets out the estimated additional households that can be connected to each of the 4 pumps stations for currently zoned area and future zoning.

Table 3 :Additional dwellings/households that can be connected to pumpstations

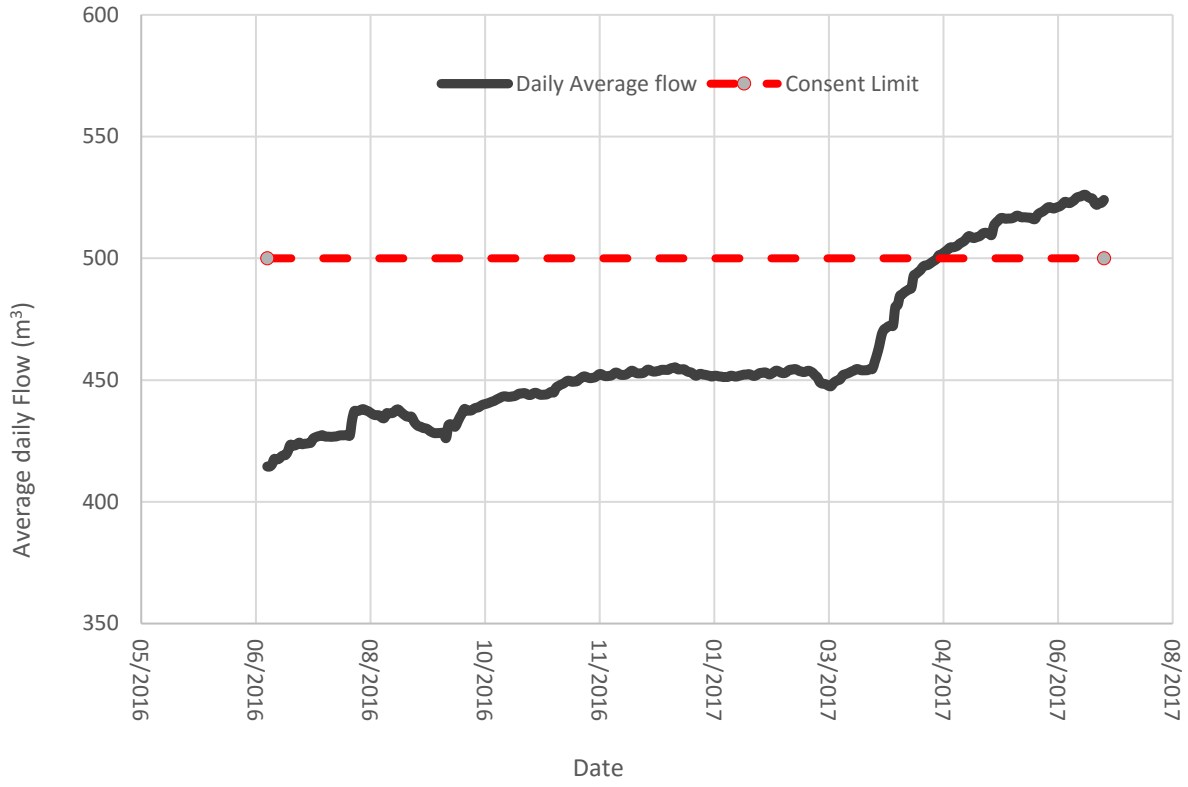
	Total Capacity	Existing lots (zoned)	Future lots- Zoned (VK Stage 2 lots less existing lots)	Lots (Future Zoning)	Total additional lots (zoned + future zoning)
PS1 (Hector Lang Dr)	385	166	36	-	
PS2 (Langs Bridge)	789	460	128	201 (assuming no rezoning allowed within PS1 area)	329 (assuming no rezoning allowed within PS1 area)
PS3 (Waipu Cove)	1174	652	180 (including 128 from PS2)	342 (including 201 from PS2)	522(including 329 from PS2)
PS4 (Hamon Rd-discharges into PS3 rising main)	556	95	0	-	-
Total	1730	747			

The revised capacity assessment shows that there is capacity in the Langs Cove and Waipu Cove network to cater for a total of 342 residential lots from both Langs Cove and Waipu Cove proposed plan change sites, with Langs Cove area limited to a maximum of 201 lots.
In the current LTP, there is funding allowed for upgrading the wastewater network in 2024/25 if required.

Wastewater Treatment Plant

Waipu, Langs Cove and Waipu Cove discharge into a common wastewater treatment plant, namely Waipu WWTP. Records of flow into the WWTP show that the flow is at the limit set down in the resource consent authorising the wastewater discharge at Waipu Wastewater Treatment Plant. The consent limits the average daily discharge volume to 500m^3. Last compliance year recorded an average daily discharge volume of 486m^3, and the trend for the current compliance year (ending 31 Dec 2017) shows that the limit is likely to be exceeded as shown on the graph below (Figure 3).

Figure 3: Average Daily Flows



Council plans to construct an additional disposal area THIS SUMMER (2017-18) to provide an interim capacity (approx. 25%) for the next 3-4 years subject to consent approval. More substantive upgrade work is planned to be completed in 2021/22 financial year as set out in the 2015-25 LTP, and this is expected to increase disposal capacity to daily average of 1,000-1,125m^3.

The capacity of the oxidation pond is not formally assessed but may be close to its limit. Assessment of capacity and upgrade options (if required) is expected to be undertaken in conjunction with the new disposal area.

Table 4 sets out the estimated additional households that can be connected to the WWTP for currently zoned area and future zoning based on the capacity of the disposal area before and after the planned upgrades.

Figure 4: Additional dwellings/households that can be connected to the WWTP

		Flow (Daily average, m^3)	Equivalent Lots	Lots at full development of current zone (VK reports)	Additional lots from future zone
Catchment Flow	Current flow into the WWTP (Waipu, Waipu Cove-langs Beach & Hamon)	524	994	1,686 *(VK reports Waipu PS1=765, Waipu Cove PS3=832, Hamon 86 lots)*	Nil
Disposal Field	Current Capacity	500	948		Nil
	Upgraded Disposal Field (Stage 1: 2017-18)	650	1,232		Nil
	Upgraded Disposal Field 2021-22)	1,125	2,134		**450**
WWTP (oxidation pond/wetland)	Not assessed				

Conclusion

- The WWTP has reached the consented limit for the volume discharged to the existing disposal area.
- Additional lots may be able to connect after the construction of the additional disposal area planned this summer (2017-18), subject to resource consent.
- Construction of an additional disposal area is planned for 2021-22 which will provide an additional 500m^3 per day to cater for the short -mid term demand.
- The planned upgrades will accommodate a combined total of 450 lots (from Waipu, Waipu Cove and Langs Cove sites). The oxidation ponds will be upgraded as required.
- PS1 (Waipu Cove) has a capacity of up to a combined total of 342 lots from both Langs Cove and Waipu Cove proposed plan change sites, with Langs Cove area restricted to a maximum of 201 lots.

Reference Information

1. Langs Beach-Waipu Cove Capacity Review-July 2017 : WASWAT-37429923-164

2. VK Report: Langs Beach Waipu Cove Impact of Future Development on Wastewater Reticulation: TRIM # 08/32902
3. VK Report: Waipu Township-Impact of Future Development on Wastewater Reticulation: TRIM # 07/71175