Technical Memo

Beachlands South Private Plan Change Fast-Track Application

Water Supply Summary
Beachlands South Limited Partnership (BSLP)

TO:	John Dobrowolski	**REF:**	V2
FROM:	Maria Johnson	**DATE:**	29 April 2024

1. INTRODUCTION

GWE has been engaged by BSLP to develop a concept design for the required water supply to service the Beachlands South Private Plan Change (PC88), which rezones approximately 307 hectares of land from Rural Countryside Living to a series of residential and business zones and Future Urban zone. PC88 was granted by independent hearing commissioners on 12 April 2024. This memo has been prepared to support the listing application for Schedule 2A of the Fast Track Bill for the live-zoned land at Beachlands South, being approximately 160 hectares, "the Project".

The water supply strategy for the Project has been developed with a focus on sustainability, self-sufficiency and independence;

- Supply-demand balance: a secure and plentiful water supply has been achieved for all stages of the Project at Beachlands South through strategic allocation of resources, including an agreement with Pine Harbour Living Limited (PHLL), utilisation of currently held permits, and prospective additional water sources.
- Compliance with water supply standards: the water supply is specifically designed to meet the requirements of the Water Services Act 2021 (WSA) and the 2022 Drinking Water Quality Assurance Rules (DWQAR) and associated Drinking Water Standards for New Zealand (DWSNZ). The proposed treatment system uses advanced treatment technologies to ensure the highest standards of water quality, safeguarding public health.
- Efficient and sustainable infrastructure: the supply philosophy incorporates rainwater harvesting for non-potable demand and water efficient fixtures and appliances, ensuring reduced water use/demand and prevent the inefficient use of drinking water for non-potable purposes.

2. METHODOLOGY

GWE's methodology has incorporated a detailed approach to ensure the water supply is efficient, sustainable, and capable of meeting the anticipated demand;

- Water demand calculations: GWE has undertaken a water supply demand analysis to accurately estimate the future water requirements for the Project in accordance with PC88. The water demand was based on the housing typologies proposed in accordance with the rezoning of housing and business land through PC88, the standards proposed through the precinct provisions and the reference documents representing best practices and established standards in New Zealand's water sector.
- Groundwater analysis: GWE has used the findings from groundwater studies and pumping tests conducted by expert hydrogeologists from Tonkin & Taylor and WGA, confirming the long-term viability of groundwater sources.
- Water supply balance analysis: this included detailed assessments to use the existing water sources, an existing supply agreement with PHLL and integration of rainwater harvesting into the supply arrangement.
- Water quality analysis and water treatment solutions: existing water quality data from existing and new constructed bores have been analysed, showing overall good water quality. Tailored water treatment processes have been designed to ensure compliance with New Zealand's Drinking Water Standards.
- Water supply infrastructure: the storage reservoirs have been located based on topography allowing a gravity flow to the community. The storage volume has been split across two reservoirs to enable sufficient turnover and ease of servicing and maintenance. The volume has been calculated to meet 72 hours at maximum total average daily demand and to provide for firefighting supply.

3. CONTEXT

This section details the current state and context for Beachlands water supply and what it means to ensure a robust and reliable water supply for the Project;

- Current water supply challenges: Beachlands area is currently serviced by PHLL, drawing water from an existing groundwater source. The area primarily relies on groundwater sources with supplemental water from rainwater harvesting.
- Watercare's intentions: Watercare Services Ltd has acknowledged the possibility to connect the community to their network in the medium to long term.
- Sustainability initiatives: integrating sustainable practices within the water supply management strategy involve the adoption of technologies that ensure efficient water use and minimise environmental impact, such as advanced water treatment processes and demand management programs.

- Regulatory compliance and planning: all planned water supply upgrades and improvements must align with the WSA and the 2022 DWQAR and DWSNZ. Demand calculations must incorporate the housing typology and reference documents representing best practices and established standards in New Zealand's water sector.
- Engagement with stakeholders: ongoing consultation and engagement with the community ensure that the strategies developed are well-informed and community-focused, aiming to deliver solutions that are both effective and acceptable to all stakeholders.

4. PLAN CHANGE 88

The following summary outlines the key components of the water supply system as considered under the recently approved Plan Change 88.

- Water supply infrastructure:
  - Groundwater sources: the design incorporates multiple bore water sources, strategically selected based on their ability to provide a sustainable yield that meets the projected water demand for the Project.
  - Water treatment processes: the water abstracted from the groundwater sources will undergo treatment including pre-treatment, advanced filtration processes and disinfection in line with the requirements of the WSA and associated 2022 DWQAR and DWSNZ. Treatment occurs at the existing PHLL water treatment plant or a new facility set up within land owned by the applicant. The treated water will then be supplied to the project site along with further water from PHLL under an agreed supply agreement.
  - Service reservoirs and distribution: to ensure adequate water pressure and storage capacity, the plan includes the construction of service reservoirs. These reservoirs are designed to hold sufficient volumes of water to manage daily demands and emergency situations effectively.
- Sustainability and environmental considerations:
  - Rainwater harvesting: the infrastructure plan and precinct provisions for PC88 include provisions for rainwater harvesting to reduce dependency on groundwater sources. This system will collect rainwater for non-potable uses, significantly reducing the overall water demand.
  - Water efficiency: PC88 requires all dwellings, businesses and institutional buildings to install water-efficient fixtures and appliances, meeting at least a 3 Star Standard according to the Water Efficiency labelling Scheme.

5. PROPOSAL

The following table summarises the key components of the proposed water supply infrastructure for the Project, outlining the elements designed to service the development efficiently and sustainably.

Table 1: Summary of Key Components of the Proposed Water Supply Infrastructure

COMPONENT	VOLUME	DESCRIPTION
Water Requirements		
145 litres/person/day	1,209 m^3/day	Low water consumption
165 litres/person/day	1,352 m^3/day	High water consumption
Sources		
PHLL	765 m^3/day	Incorporate rainwater harvesting systems and water efficient fixtures to reduce overall water demand
Formosa bore	115 m^3/day	
Existing Southern Bores	286 m^3/day	
Southern Bore	186 m^3/day	
TOTAL	**1,352 m^3/day**	
Treatment	PHLL and Formosa upgraded to treat additional capacity	
Service Reservoir	4,500 m^3	72 hours storage effective storage for the maximum total average daily demand. Split between 2 reservoirs for adequate turnover

6. ASSESSMENT OF EFFECTS

The assessment of the environmental and operational impacts of the proposed water supply infrastructure for the Project includes critical evaluations of bore testing results and strategic approach to ensure a sustainable, secure water supply. Key details are as follows:

- WGA have investigated the Formosa Golf Club Bore and the existing Southern bores to provide a robust and sustainable foundation of the water quantity available and used as part of the water supply demand balance analysis.
- GWE's analysis shows a balance of water demand and supply has been achieved for the Project through strategic allocation of resources, including an agreement with PHLL, utilisation of currently held permits, and prospective additional water sources. This thorough planning allows for a secure and plentiful water supply to be catered for the Project.
- The maintenance and assurance of water quality have not been compromised in the pursuit of quantity. The planned treatment processes adhere to the WSA and the 2022 DWQAR and DWSNZ.

- Sustainability has been factored into the core of the plan, incorporating rainwater harvesting and the application of water-efficient fixtures within all buildings in the Project. The rainwater harvesting systems will cater to non-potable water requirements such as toilets, laundry, and gardening and therefore reduce the overall water demand. This will ensure that drinking water from groundwater supply is not used inefficiently for non-potable purposes. Non-potable water equates to about 50% of household water demand in Auckland.

7. CONCLUSION

In conclusion, GWE has adopted accepted engineering and scientific methodologies while preparing the water supply strategy and concept for the Project in accordance with PC88. Through standard calculations regarding supply and demand, the implementation of the above-mentioned water quality standards, the integration of Auckland Region's sustainable practices, and the application of industry recognised factor of safety, the strategy provides a sustainable and sufficient supply of water for the Project, that meets water quality standards and requirements in New Zealand. The quality of the water supplied, and level of service will be up to par with Watercare reticulated supply standards.

8. LIMITATIONS

This report has been prepared for the sole benefit of Beachlands South Limited Partnership as our Client, and their appointed representatives, according to their instructions, for the specific objectives described herein. This report is qualified in its entirety and should be considered in the light of our Terms of Engagement with the Client and the following:

a. Data or opinions contained within the report may not be used in other contexts or for any other purpose without our prior review and written agreement. Any reliance will be at the parties' sole risk.

b. No responsibility is assumed for inaccuracies in reporting by the information providers. In no event, regardless of whether GWE 's consent has been provided, does GWE accept any liability, whether directly or indirectly, for any liability or loss suffered or incurred by any third party to whom this report is disclosed placing any reliance on this report, in part or in full.

c. GWE has relied on information provided by the Client and by third parties to produce this document and arrive at its conclusions. GWE has not verified information provided (unless specifically noted otherwise) and we assume no responsibility and make no representations with respect to the adequacy, accuracy, or completeness of such information.

Prepared by:	Reviewed by:	Approved by:
		
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