

DRINKING WATER SERVICING REPORT

Horseshoe Bush Road Subdivision Dairy Flat, Auckland

TUAKIRI PROPERTY LTD
May 2026 | V2



PROGRESS ENGINEERED. PROBLEMS SOLVED.

Auckland | Waiheke | Waikato | Bay of Plenty

DOCUMENT CONTROL RECORD

Client: Tuakiri Property Ltd

Project Location: Dairy Flat, Auckland

Job Number: J7850

Document: Horseshoe Bush Road Subdivision/ Drinking Water Servicing Report

Version: V2

Document Status: Final - Approved for Issue

Date: May 2026

Prepared by: 
Maryam Roshan, Graduate Engineer

Reviewed and Approved by: 
Maria Johnson, Water Sector Lead

Filename: [https://gweconsult.sharepoint.com/sites/ActiveProjects/LD/Horseshoe Bush Rd Subdivision-J7850/03-WS/04-Reports/RDW01v2 FINAL-Horseshoe Bush Rd-DW Servicing.docx](https://gweconsult.sharepoint.com/sites/ActiveProjects/LD/Horseshoe%20Bush%20Rd%20Subdivision-J7850/03-WS/04-Reports/RDW01v2%20FINAL-Horseshoe%20Bush%20Rd-DW%20Servicing.docx)

GWE Consulting Engineers

www.gwe.co.nz

0800 445 001

COPYRIGHT: The concepts and information contained in this document are the property of GWE Consulting Ltd. Use or copying of this document in whole or in part without the written permission of GWE constitutes an infringement of copyright.

DOCUMENT STATUS

STATUS	DATE	DETAILS	AUTHOR	CHECKED	APPROVED
Draft	March 2026	RDW01v1	MR	MJ	
Final	May 2026	RDW01v2 FINAL	MR	MJ	MJ
Final R1	May 2026	RDW01v2 FINAL R1	MR	MJ	MJ

TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
1 INTRODUCTION	2
2 PURPOSE AND SCOPE.....	2
3 EXISTING ENVIRONMENT	2
4 WATER DEMAND ASSESSMENT	3
4.1 Average Daily Water Demand	3
4.2 Demand Management and Reduction.....	4
5 WATER SUPPLY SERVICING PHILOSOPHY.....	7
6 WATER TREATMENT	7
6.1 Treatment System.....	7
6.2 Indicative Storage Tanks	8
7 DRINKING WATER COMPLIANCE	9
8 OWNERSHIP AND MANAGEMENT.....	9
9 REGULATORY FRAMEWORK AND CONSENTS	9
10 CONCLUSIONS.....	10
11 LIMITATIONS.....	10

APPENDICES

APPENDIX A Master Plan

APPENDIX B Water Demand Calculations

LIST OF FIGURES

Figure 1: Rangitooopuni River and its Catchment Area.....	3
Figure 2: Historical Rainfall Data for Dairy Flat, Auckland	5

LIST OF TABLES

Table 1: Water Demand Calculation	4
Table 2: Rainwater Harvesting Calculation	6
Table 3: Water Supply–Demand Balance	6

EXECUTIVE SUMMARY

This Drinking Water Servicing Report provides a high-level assessment of potable water supply requirements and servicing options for the proposed Horseshoe Bush Road subdivision in Dairy Flat, Auckland, to support the Fast-Track referral application.

The proposed development comprises approximately 1,020 residential dwellings and 1,200m² commercial activities (Gross Floor Area or GFA). The assessment considers development assumptions, water demand, available supply sources, and a concept-level servicing strategy. In the absence of a reticulated Watercare supply, a self-supplied water system is proposed, utilising groundwater as the primary source and rainwater harvesting as a supplementary source for non-potable uses.

A centralised approach to water supply is proposed, incorporating abstraction, treatment, storage, and reticulation to service the development.

The proposed system is expected to be classified as a Networked Supply – Large drinking water supply and will be required to comply with the Water Services Act 2021 and the Drinking Water Quality Assurance Rules administered by Taumata Arowai.

Further investigations and detailed design will be undertaken at the substantive application stage.

1 INTRODUCTION

This report has been prepared by GWE to provide an assessment of drinking water servicing for the proposed subdivision at Horseshoe Bush Road, Dairy Flat, Auckland. The development is anticipated to comprise approximately 1,020 residential dwellings and 1,200m² GFA commercial activities (refer to the master plan in Appendix A).

The proposed development is anticipated to be constructed in five stages, with staging to be aligned with the progressive delivery of infrastructure and servicing requirements across the site (refer to Maven staging plan). At this stage, detailed dwelling layouts and building footprints have not yet been confirmed, and therefore the assessment presented within this report is based on concept-level masterplan information and adopted servicing assumptions.

It is assumed that no connection to the public Watercare reticulated water supply network is available or feasible for the site. Accordingly, a self-supplied water system is proposed for this site.

This report has been prepared to support the fast-track referral application and outlines the proposed approach to water supply, including demand assessment, servicing philosophy, treatment requirements, and regulatory considerations.

2 PURPOSE AND SCOPE

This report provides a high-level assessment of delivery drinking water servicing for the project. The report addresses the following:

- Background information and development assumptions.
- Water demand estimation based on standard design criteria.
- Identification of key servicing considerations, constraints, and opportunities.
- High-level water supply servicing philosophy.
- Indicative treatment and storage infrastructure requirements.
- Compliance with the Water Services Act 2021 and Drinking Water Quality Assurance Rules (DWQAR).
- Regulatory considerations and approvals required to support the development.

This report is intended for concept-level assessment only and does not include detailed design, bore testing, or site-specific investigations. These will be undertaken at the substantive application stage.

3 EXISTING ENVIRONMENT

The project is located in Dairy Flat, Auckland, and comprises an overall land area of approximately 77.9 hectares.

The site is located within an area where reticulated potable water supply is not currently available. As such, surrounding properties are generally serviced by self-supplied systems, typically involving groundwater abstraction and/or rainwater harvesting.

Groundwater within the wider Dairy Flat area is commonly sourced from the Rangitooopuni Aquifer (as can be seen in Figure 1), which is a potential primary water supply for the development.

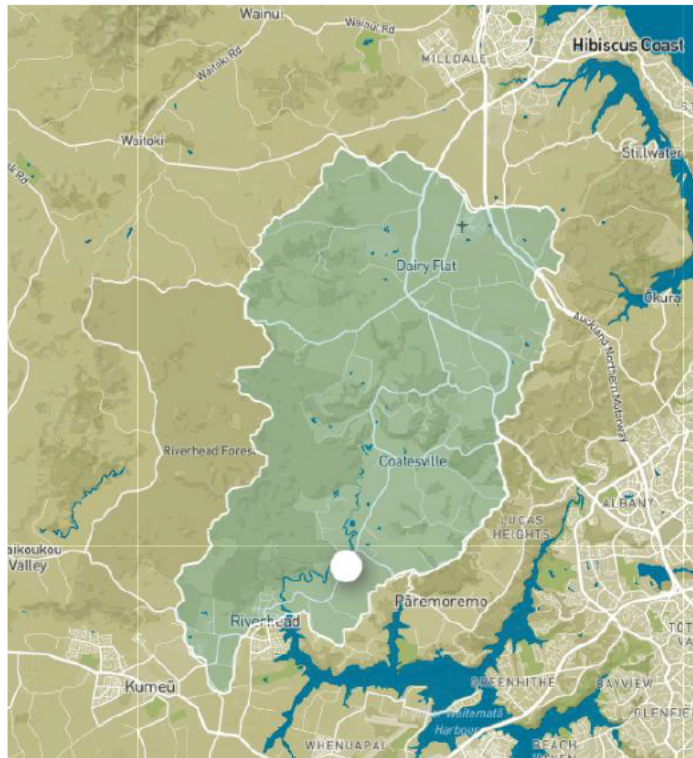


Figure 1: Rangitooopuni River and its Catchment Area

Based on LAWA- Auckland Region

The suitability of this source will require confirmation through bore investigation and water quality testing at the next stage of design.

At this stage, no site-specific water quality data or bore yield information is available, and therefore assumptions have been made based on typical conditions within the area.

4 WATER DEMAND ASSESSMENT

4.1 Average Daily Water Demand

Water demand for the development has been estimated using standard design flow assumptions consistent with Auckland Council Technical Publication TP58 (*On-site Wastewater Systems: Design and Management Manual, 2004*).

The assessment is based on a mixed-use development comprising residential lots and approximately 1,200m² of commercial GFA identified within the updated masterplan. The following assumptions were adopted in the water demand assessment:

- Occupancy for each residential lot was assumed based on the adopted lot area ranges.

- A design water demand allowance of 180 L/person/day (*Households with Standard Fixtures including 11litre flush water cisterns; automatic washing machine and dishwasher*) was adopted in accordance with TP58 guidelines for residential developments.
- A 50/50 split between wet and dry commercial activities was assumed for the proposed commercial area for the purpose of estimating commercial water demand.
- GFA has been assumed to comprise predominantly single-storey commercial buildings.

Based on the development layout and adopted assumptions, the estimated average daily water demand for the development has been calculated as summarised in Table 1.

Table 1: Water Demand Calculation

TYPE OF ACTIVITY	ASSUMED OCCUPANCY	DESIGN FLOW ALLOWANCE (L/person/day)	WATER DEMAND (BORE ABSTRACTION) (m ³ /day)
Residential (<219 m ²)	2	180 ¹	9
Residential (220-249 m ²)	3		29.16
Residential (250-279 m ²)	3		85.86
Residential (280-319 m ²)	4		322.56
Residential (320-499 m ²)	4		180
Residential (500-999 m ²)	5		41.4
Residential (1,000-3,499 m ²)	6		35.64
Residential (>3,500 m ²)	6		5.4
Commercial (1,200 m ²)		15 L/day per net m ² of floor area- Wet Activity	6.30
		1 person per 50 m ² net floor area at 65 L/person/day- Dry Activity	0.55
Total			715.87

Note: TP58: These include 11litre flush water cisterns; automatic washing machine and dishwasher. No garbage grinder unless other water saving measures such as low flush 6/3litre toilet cisterns.

Accordingly, the estimated average daily water demand for the development is approximately 716 m³/day, which is proposed to be primarily supplied via groundwater abstraction, subject to further investigation and bore testing.

4.2 Demand Management and Reduction

To reduce reliance on groundwater abstraction, it is proposed that rainwater harvesting systems be implemented across the development for non-potable uses. This may include:

- Toilet flushing.
- Irrigation.
- Outdoor water use.

The incorporation of rainwater harvesting is expected to reduce potable water demand and improve sustainability outcomes for the development.

Based on the provided master plan (20 May 2026), the development comprises a range of residential lot sizes together with a proposed commercial area.

The following assumptions were adopted for the rainwater harvesting assessment:

- The adopted lot area used in the assessment was taken as the average of the minimum and maximum lot areas provided in the masterplan.
- Residential roof coverage assumptions adopted were:
 - Residential lots <500 m²: 35% roof coverage.
 - Residential lots 500–1000 m²: 30% roof coverage.
 - Residential lots >1000 m²: 25% roof coverage/
 - A roof coverage assumption of 70% was adopted for the proposed commercial area.
- Historical rainfall data for Dairy Flat indicates an average annual rainfall of approximately 1.025 m/year based on Figure 2; however, for a more conservative assessment, rainfall during the drier months (November to March) equivalent to approximately 390 mm/year has been adopted for the calculation.
- Rainwater losses and collection inefficiencies, including evaporation, first flush diversion, and system spillage, were assumed to be 17.5%.



Figure 2: Historical Rainfall Data for Dairy Flat, Auckland

Source: <https://www.metservice.com/towns-cities/regions/auckland/locations/dairy-flat/past-weather>

Based on the provided masterplan layout and the adopted assumptions, the potential rainwater harvesting yield has been estimated as follows:

Table 2: Rainwater Harvesting Calculation

TYPE OF ACTIVITY	NO. OF LOTS	RAINFALL COLLECTION (m ³ /day)
Residential (<219 m ²)	25	1.69
Residential (220-249 m ²)	54	3.91
Residential (250-279 m ²)	159	12.98
Residential (280-319 m ²)	448	41.40
Residential (320-499 m ²)	250	31.59
Residential (500-999 m ²)	46	9.12
Residential (1,000-3,499 m ²)	33	16.36
Residential (>3,500 m ²)	5	3.86
Commercial (1,924 m ²)		0.74
Total		121.63

The above assessment indicates that rainwater harvesting could provide approximately 122 m³/day, representing a contribution toward non-potable water demand and substantially reducing reliance on groundwater abstraction.

Table 3: Water Supply–Demand Balance

DAILY WATER DEMAND (m ³ /day)	716
RAINWATER HARVESTING (m ³ /day)	121.63
WATER SUPPLY- DEMAND BALANCE (m ³ /day)	594.37

Based on Table 3, the remaining demand of approximately 595 m³/day is expected to be supplied via groundwater abstraction.

It should be noted that these calculations are based on concept-level assumptions, and further refinement will be undertaken at the substantive application stage once detailed building layouts, roof areas, and water use patterns are confirmed.

Detailed calculations relating to the estimated water demand assessment and rainwater harvesting analysis are provided in Appendix B. It should be noted that firefighting demand has been excluded from the water demand calculations. Based on the groundwater assessment undertaken by Terra Aqua Consultants (2026), the Rangitooopuni Waitematā Aquifer currently has approximately 365,927 m³/year of unallocated groundwater available. The proposed groundwater abstraction volume for the development is approximately 219,000 m³/year, which is within the currently available allocation. The remaining available allocation following the proposed take is estimated to be approximately 146,927 m³/year, subject to confirmation through the resource consent process and detailed hydrogeological assessment.

5 WATER SUPPLY SERVICING PHILOSOPHY

At this stage, it is assumed that no connection to a public reticulated water supply network is available to service the development. Accordingly, a fully self-supplied water servicing approach is proposed.

The primary water source for the development is anticipated to be groundwater abstraction from the Rangitooopuni Aquifer. This aquifer is known to be a commonly utilised groundwater source within the Dairy Flat area and is considered a viable option for supplying potable water. However, the available yield of the aquifer and the sustainable abstraction rate will need to be confirmed through detailed hydrogeological investigations and bore testing at the substantive application stage.

To enhance system resilience and reduce reliance on groundwater resources, rainwater harvesting is proposed as a supplementary water source. Harvested rainwater would be used for non-potable purposes such as irrigation, toilet flushing, and outdoor use, thereby reducing demand on the potable water supply system.

The overall servicing philosophy is based on a centralised treatment and storage approach, whereby groundwater is abstracted via production bores, treated to meet drinking water standards, and distributed to the development through an internal reticulation network. This approach allows for efficient management of water quality, monitoring, and system operation.

At this stage, a detailed supply reliability assessment has not been undertaken due to the absence of site-specific bore yield and rainfall capture data. Based on the preliminary demand–supply assessment, a combination of groundwater abstraction and rainwater harvesting is expected to meet the development demand, subject to confirmation through further investigation.

Should a shortfall in supply be identified, additional measures may include:

- Increasing bore capacity or number of production bores.
- Increasing storage capacity to buffer peak demand.
- Expanding rainwater harvesting systems.

These options will be assessed and refined at the substantive application stage.

6 WATER TREATMENT

6.1 Treatment System

A centralised water treatment system is proposed to ensure that abstracted groundwater is treated to meet drinking water standards prior to distribution.

A high-level treatment process suitable for groundwater source will be included in the design for the proposed water treatment plant. This will include:

- Raw water storage tanks.
- Pre-treatment (leaf screen/mesh filtration).

- Cartridge filtration to remove particulates and reduce turbidity.
- Disinfection (e.g. UV treatment and/or chlorination).
- Treated water storage tanks.
- Booster pumps and private distribution network.

The final treatment configuration will be determined based on raw water quality, which will be confirmed through bore testing and laboratory analysis.

6.2 Indicative Storage Tanks

Provision of water storage can help to balance supply and demand, maintain system pressure, and provide operational resilience for the proposed development.

Raw (untreated) water storage is proposed to manage variability in rainwater supply. Based on typical design practice on individual dwellings, untreated water storage for rainwater harvesting is generally provided for 30 days of non-potable demand when rainwater is the sole source of supply. For this site, two approaches are possible and commonly adopted depending on rainwater design preferences:

- Rainwater storage tanks on each individual dwelling for non-potable uses with variable storage volumes to accommodate lot sizes, supplemented by the centralised reticulated system (for the summer months), or
- Centralised raw water storage tanks, fed by rainwater harvesting, supplemented by groundwater.

For feasibility purposes, we have adopted an indicative raw water storage volume for both rainwater and groundwater equivalent to approximately 1.5 days of average total daily water demand (potable and non-potable), equating to approximately 1,075 m³. This also provides operational resilience and buffers short-term fluctuations in bore supply and treatment operations.

Treated water storage will also be provided to accommodate fluctuations in daily demand, including peak usage periods, and to ensure continuity of supply during interruptions to abstraction or treatment. Typically, treated water storage is provided for 2-3 days of demand. For this project, a conservative storage volume equivalent to approximately 3 days of average daily demand has been adopted, equating to approximately 2,148 m³. This volume includes 24 hours of firefighting storage. Alternatively, firefighting can be provided through additional dedicated storage, additional raw water tank (s) if the firefighting supply is on a dedicated ring main. This is subject to final firefighting design and storage configuration. Water supply for firefighting purposes will be required to be provided in accordance with the relevant NZ Fire Service Fire Fighting Water Supplies Code of Practice.

The final storage volumes, configuration, and number of tanks will be confirmed at the substantive application stage, taking into account bore yield, demand variability, operational requirements, rainwater harvesting system design preferences and system redundancy.

7 DRINKING WATER COMPLIANCE

The proposed drinking water system will be required to comply with the requirements of the Water Services Act 2021 and the Drinking Water Quality Assurance Rules (DWQAR) administered by Taumata Arowai.

Based on the scale of the development (approximately 1,020 dwelling lots and 1,200m² GFA of commercial activities), the proposed system will be classified as a Networked Supply – Large drinking water supply. This enables a centralised water treatment system to supply multiple buildings through a reticulated distribution network. To comply with this pathway, the supply must meet the requirements of the General, Source S3, Treatment T3, and Distribution D3 rule modules of the DWQAR.

The water supply will be required to be registered with Taumata Arowai, and ongoing compliance monitoring and reporting will be undertaken in accordance with regulatory requirements. For example, Preparation of a Water Safety Plan (WSP) and Source Water Risk Management Plan (SWRMP) will be required.

Detailed compliance pathways, including confirmation of treatment, monitoring and reporting requirements, will be established at the substantive application stage once water quality data and system design are confirmed.

8 OWNERSHIP AND MANAGEMENT

For the successful management of water supply for the development, a strong management framework must be implemented and operated during the life of the resource consent and detailed through the future conditions of consent. Ownership and management options include:

- Private utility management.
- Body corporate structure.

The above options will be investigated at the substantive application stage.

9 REGULATORY FRAMEWORK AND CONSENTS

The proposed water supply system will be subject to a range of statutory and regulatory requirements.

The design and operation of the water supply system will need to comply with relevant standards and guidelines, including:

- Water Services Act 2021 and Drinking Water Quality Assurance Rules (DWQAR)
- NZ Fire Service Fire Fighting Water Supplies Code of Practice SNZ PAS 4509:2008 (currently being updated)
- Auckland Council requirements

In addition, key approvals and consents likely to be required include:

- Registration and compliance pathway with Taumata Arowai (Water Services Act 2021 and Drinking Water Quality Assurance Rules 2022).

- Resource and/or Building consents for tanks, treatment plant buildings and pump stations.
- Health and safety and operator licensing arrangements for ongoing operation, to be undertaken by the operator in accordance with Taumata Arowai requirements and relevant health and safety regulations.

The regulatory pathway and consent requirements will be further defined at the substantive application stage.

10 CONCLUSIONS

The assessment confirms that a centralised potable water supply system based on groundwater abstraction from the Rangitooopuni Aquifer, supplemented by rainwater harvesting for non-potable uses, is feasible for the proposed development.

The estimated average daily water demand of approximately 716 m³/day can be partially met through rainwater harvesting, which is expected to provide approximately 122 m³/day for non-potable uses. The remaining demand of approximately 595 m³/day is proposed to be supplied via groundwater abstraction, subject to confirmation through bore testing and hydrogeological assessment.

The proposed development at Horseshoe Bush Road will be classified as a Networked Supply – Large drinking water supply, requiring registration and ongoing compliance with the Water Services Act 2021 and the Drinking Water Quality Assurance Rules 2022 administered by Taumata Arowai.

Further investigations, including bore testing, water quality assessment, and detailed treatment and infrastructure design, will be undertaken at the substantive application stage.

11 LIMITATIONS

This report has been prepared for the sole benefit of **Tuakiri Property Ltd** as our Client, and their appointed representatives, and those reviewing/evaluating the application for Referral under the FTAA 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.

APPENDIX A
MASTER PLAN

APPENDIX B

WATER DEMAND CALCULATIONS
