

Drinking Water Test Report

To:	Dairy Flat School
From:	Waste Management–Redvale
Sampling Date:	28 May 2026
Sampling Locations:	Staff Room (Figure 1), Health Room (Figure 2), Hall Kitchen (Figure 3)
Sampling Source:	Water Tap
Analytical Institution:	Hill Laboratories

Executive Summary

The May 2026 drinking water results confirm that the water quality at all three locations remains microbiologically safe and chemically compliant with the New Zealand Drinking Water Standards for the parameters tested.

Measured pH values were slightly below the aesthetic guideline range and were consistent with previous monitoring results. The low pH is attributed to the naturally low mineral content of the rainwater supply and local plumbing conditions. As pH is an aesthetic (non-health-based) parameter, the observed values are not considered to present a risk to drinking water safety.

Sampling Method

Routine water quality and E. coli samples were collected in accordance with Hill Laboratories' guidelines. Samples were taken using laboratory-supplied containers without pre-rinsing.

For tap sampling, three locations were sampled (Figures 1–3). The tap outlets were disinfected using alcohol wipes and flushed for 2–3 minutes prior to sample collection. Samples were then collected directly into the containers and securely capped.

For microbiological analysis, sterile containers were used and aseptic techniques were followed. The inside of the containers and lids were not touched, and samples were filled to within approximately 1 cm of the top.

Following collection, samples were refrigerated (not frozen) and stored in a chilled, dark container with ice packs to maintain temperatures below 10°C. All samples were labelled with the date and time of collection and transported to the laboratory within 24 hours.



Figure 1. Staff Room



Figure 2. Health Room



Figure 3. Hall Kitchen

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Analysis of Results

A summary of the May 2026 test results, together with comparisons to results from October–December 2025 and February–April 2026, and relevant New Zealand, WHO, and US EPA drinking water standards, is presented in Tables 1 and 2. The original Hill Laboratories reports are appended to this report.

The May 2026 laboratory results indicate that all samples were microbiologically safe, with *Escherichia coli* not detected (<1 MPN/100 mL) at any sampling location. This confirms the absence of faecal contamination and indicates that the treatment system is operating effectively.

Turbidity remained very low (0.073–0.15 NTU), well below the aesthetic guideline value of 5 NTU. Overall, turbidity levels in May improved compared with previous months, with the Hall Kitchen recording the lowest turbidity. This could be attributed to the additional under-sink filtration system installed at this location.

General water chemistry parameters, including electrical conductivity (approximately 1.5–1.6 mS/m) and total dissolved salts (approximately 10 mg/m³), indicate very low dissolved mineral content. Alkalinity and hardness were also low, reflecting limited buffering capacity typical of rainfall derived supplies.

All analysed metals, including arsenic, lead, copper, iron, and manganese, were either below detection limits or present at very low concentrations, well within applicable guideline values. Similarly, major ions such as chloride, nitrate, and sulphate were detected at low levels, with no indication of contamination.

Measured pH values in May ranged from 5.7 to 6.1 across the three sampling locations, which were slightly below the aesthetic guideline range (7.0–8.5) and consistent with previous monitoring results (Figure 4). Compared with April, the pH in the Health Room remained stable at 6.1, while the Staff Room and Hall Kitchen decreased to 5.7. These values are typical of rainwater-derived supplies, which generally have low mineral content and tend to absorb carbon dioxide (CO₂) from the atmosphere, resulting in slightly acidic conditions. This is supported by the relatively elevated free carbon dioxide concentrations measured at the Staff Room and Hall Kitchen. The comparatively lower free CO₂ concentration in the Health Room may be related to lower water usage and longer stagnation periods, allowing dissolved CO₂ to dissipate and resulting in a slightly higher pH.

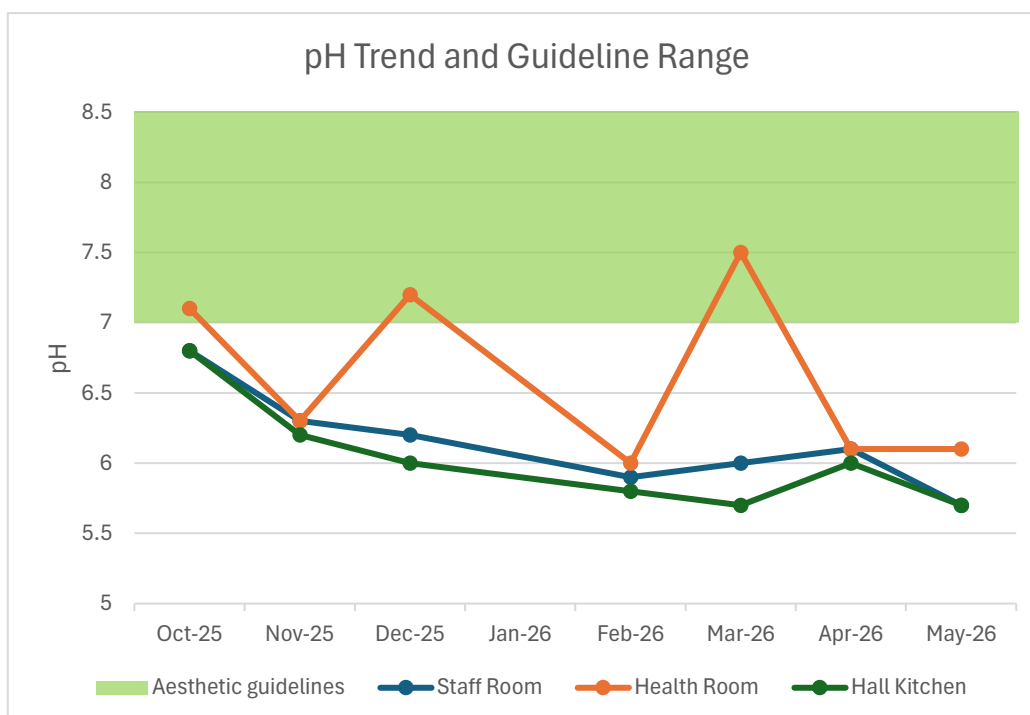


Figure 4. pH Trend with Aesthetic Guideline Range (Oct 2025 – May 2026)

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The observed pH values and variations are considered typical of low-mineral water systems. While the measured pH values were slightly below the aesthetic guideline range, pH is not a health-based parameter and the results do not pose a risk to drinking water safety. Continued routine monitoring is recommended to track pH trends over time.

Overall, the results confirm that the drinking water quality remains suitable for consumption and compliant with the applicable drinking water standards, with no evidence of contamination. No corrective actions are required at this time, and routine monitoring should continue.

Thanks,

Dr. Na Zhang (she/her)

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Table 1. Summary of Tap Water Quality Results for October–December 2025 with Comparison to New Zealand, WHO, and US EPA Drinking Water Standards

Parameters	Sample Name: Lab Number:	October 2025			November 2025			December 2025			Drinking Water Standards		
		Staff Room	Health Room	Hall Kitchen	Staff Room	Health Room	Hall Kitchen	Staff Room	Health Room	Hall Kitchen	NZ Maximum Acceptable Value (MAV) ^a	WHO Limit	US EPA Limit
Escherichia coli	MPN / 100mL	< 1	<1	< 1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Turbidity	NTU	0.37	0.41	0.12	0.20	0.21	0.11	0.230	0.277	0.128	≤5 (aesthetic) ^b	<5	<1 (recommended)
pH	pH Units	6.8	7.1	6.8	6.3	6.3	6.2	6.2	7.2	6.0	7.0–8.5 (aesthetic) ^b	6.5–8.5	6.5–8.5
Total Alkalinity	g/m ³ as CaCO ₃	11	13.9	10.6	3.6	3.6	3.4	3.58	6.96	3.18	-	-	-
Free Carbon Dioxide	g/m ³ at 25°C	3.3	2.1	3.4	4.0	3.8	4.2	4.9	<1.0	6.1	-	-	-
Total Hardness	g/m ³ as CaCO ₃	14.5	16	14.5	2.3	2.5	3.2	1.79	1.79	2.20	≤200 (aesthetic) ^b	<500	<500
Electrical Conductivity (EC)	mS/m	6.4	7.5	6.3	1.6	1.8	1.6	1.0	1.7	1.0	-	-	-
Electrical Conductivity (EC)	µS/cm	64	75	63	16	18	16	10	17	10	-	<1500	<2500
Approx Total Dissolved Salts	g/m ³	43	50	42	11	12	11	6.84	11.69	6.93	≤1000 (aesthetic) ^b	<1000	<500 (aesthetic) ^b
Total Arsenic	g/m ³	< 0.0011	<0.0011	< 0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.01	<0.01	<0.01
Total Boron	g/m ³	< 0.053	<0.053	< 0.053	<0.053	<0.053	<0.053	<0.053	<0.053	<0.053	<2.4	<2.4	-
Total Calcium	g/m ³	4.4	4.6	4.4	0.57	0.60	0.91	0.438	0.43	0.613	-	-	-
Total Copper	g/m ³	0.037	0.121	0.0038	0.061	0.141	0.0037	0.0694	0.128	0.00424	<2	<2	<1.3
Total Iron	g/m ³	< 0.021	0.023	< 0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	≤0.3 (aesthetic) ^b	<0.3	<0.3
Total Lead	g/m ³	0.00062	0.00118	0.00028	0.00083	0.00088	0.00061	0.000966	0.001078	0.000604	<0.01	<0.01	<0.015
Total Magnesium	g/m ³	0.87	1.12	0.86	0.22	0.23	0.21	0.170	0.173	0.163	-	-	-
Total Manganese	g/m ³	0.0023	0.0035	0.0012	0.00161	0.00157	0.00093	0.00196	0.00183	0.00151	0.04 (Staining); ≤0.1(Taste)	<0.4	<0.05 (aesthetic) ^b
Total Potassium	g/m ³	0.53	0.53	0.53	0.187	0.187	0.172	0.137	0.138	0.144	-	-	-
Total Sodium	g/m ³	5.6	5.7	5.6	1.62	1.59	1.52	1.290	1.278	1.298	≤200 (aesthetic) ^b	<200	<20 (health advisory) ^c

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Total Zinc	g/m ³	0.21	0.189	0.154	0.49	0.48	0.175	0.335	0.320	0.189	≤1.5 (aesthetic) ^b	<3	<5
Chloride	g/m ³	9	9.6	9	2.6	2.6	2.7	2.53	2.29	2.16	≤250 (aesthetic) ^b	<250	<250
Nitrate-N	g/m ³	0.07	0.07	0.08	0.09	0.09	0.11	0.147	0.126	0.171	<11.3	<11.3	<10
Sulphate	g/m ³	4.3	4.6	4.3	0.8	0.8	0.8	0.76	0.77	0.69	≤250 (aesthetic) ^b	<250	<250

^a Taken from the 'Water Services (Drinking Water Standards for New Zealand) Regulations 2022'.

^b Taken from 'Aesthetic Value for Drinking Water Notice 2022' issued by the Water Services Regulator ("Taumata Arowai")

^c Refer to non-health-related parameters — things that affect the taste, smell, colour, or appearance of water but don't pose a health risk.

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Table 2. Summary of Tap Water Quality Results for February–May 2026, with Comparison to New Zealand, WHO, and US EPA Drinking Water Standards

Parameters	Sample Name: Lab Number:	February 2026			March 2026			April 2026			May 2026			Drinking Water Standards		
		Staff Room	Health Room	Hall Kitchen	Staff Room	Health Room	Hall Kitchen	Staff Room	Health Room	Hall Kitchen	Staff Room	Health Room	Hall Kitchen	NZ Maximum Acceptable Value (MAV) ^a	WHO Limit	US EPA Limit
Escherichia coli	MPN / 100mL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Turbidity	NTU	0.22	0.19	0.09	0.21	0.29	0.10	0.22	0.19	0.17	0.15	0.17	0.073	≤5 (aesthetic) ^b	<5	<1 (recommended)
pH	pH Units	5.9	6.0	5.8	6.0	7.5	5.7	6.1	6.1	6.0	5.7	6.1	5.7	7.0–8.5 (aesthetic) ^b	6.5–8.5	6.5–8.5
Total Alkalinity	g/m ³ as CaCO ₃	2.6	2.6	2.4	2.20	6.6	2.0	2.2	3.2	1.8	2.2	2.8	2.2	-	-	-
Free Carbon Dioxide	g/m ³ at 25°C	7	5.7	7.7	4.8	<1.0	7.2	3.4	4.6	3.7	8.1	4.1	8.7	-	-	-
Total Hardness	g/m ³ as CaCO ₃	2.70	2.60	2.90	2.71	2.78	2.8	2.04	2.09	2.07	1.70	1.70	1.74	≤200 (aesthetic) ^b	<500	<500
Electrical Conductivity (EC)	mS/m	2.6	2.8	2.7	2.5	3.2	2.6	2.3	2.3	2.5	1.5	1.6	1.5	-	-	-
Electrical Conductivity (EC)	µS/cm	26	28	27	25	32	26	23	23	25	15	16	15	-	<1500	<2500
Approx Total Dissolved Salts	g/m ³	17	18	18	16.75	21.33	18	15.61	15.48	16.43	10	10	9.83	≤1000 (aesthetic) ^b	<1000	<500 (aesthetic) ^b
Total Arsenic	g/m ³	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.01	<0.01	<0.01
Total Boron	g/m ³	<0.053	<0.053	<0.053	<0.053	<0.053	<0.053	<0.053	<0.053	<0.053	<0.053	<0.053	<0.053	<2.4	<2.4	-
Total Calcium	g/m ³	0.36	0.36	0.49	0.427	0.446	0.49	0.272	0.293	0.325	0.26	0.27	0.298	-	-	-
Total Copper	g/m ³	0.078	0.130	0.0044	0.0663	0.0875	0.0063	0.0582	0.0874	0.00643	0.052	0.060	0.00365	<2	<2	<1.3
Total Iron	g/m ³	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	<0.021	≤0.3 (aesthetic) ^b	<0.3	<0.3
Total Lead	g/m ³	0.00128	0.00133	0.00046	0.00102	0.00092	0.00074	0.00130	0.00137	0.00103	0.00096	0.00084	0.00033	<0.01	<0.01	<0.015
Total Magnesium	g/m ³	0.43	0.42	0.42	0.40	0.405	0.38	0.330	0.329	0.306	0.25	0.26	0.241	-	-	-
Total Manganese	g/m ³	0.00174	0.00198	0.0026	0.00176	0.00177	0.0028	0.00076	0.00087	0.00167	0.00088	0.00108	0.00146	0.04 (Staining); ≤0.1(Taste)	<0.4	<0.05 (aesthetic) ^b
Total Potassium	g/m ³	0.25	0.23	0.24	0.237	0.24	0.23	0.168	0.173	0.170	0.117	0.118	0.118	-	-	-
Total Sodium	g/m ³	3.6	3.4	3.6	3.20	3.22	3.2	3.36	3.46	3.45	2.0	1.98	2.01	≤200 (aesthetic) ^b	<200	<20 (health advisory) ^c

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Total Zinc	g/m ³	0.44	0.45	0.36	0.387	0.399	0.35	0.382	0.371	0.310	0.28	0.29	0.274	≤1.5 (aesthetic) ^b	<3	<5
Chloride	g/m ³	6.0	5.6	6.0	5.62	5.6	5.8	5.48	5.18	5.51	3.4	3.4	3.37	≤250 (aesthetic) ^b	<250	<250
Nitrate-N	g/m ³	0.15	0.15	0.16	0.170	0.17	0.2	0.091	0.085	0.092	0.13	0.13	0.12	<11.3	<11.3	<10
Sulphate	g/m ³	1.2	1.2	1.2	1.12	1.08	1.1	0.88	0.85	0.88	0.8	0.8	0.74	≤250 (aesthetic) ^b	<250	<250

^a Taken from the 'Water Services (Drinking Water Standards for New Zealand) Regulations 2022'.

^b Taken from 'Aesthetic Value for Drinking Water Notice 2022' issued by the Water Services Regulator ("Taumata Arowai")

^c Refer to non-health-related parameters — things that affect the taste, smell, colour, or appearance of water but don't pose a health risk.

Certificate of Analysis

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Client: Waste Management NZ Limited	Lab No: 4228758	DWAPV1
Contact: Na Zhang	Date Received: 29-May-2026	
C/- Waste Management NZ Limited	Date Reported: 02-Jun-2026	
PO Box 228	Quote No: 141146	
Silverdale	Order No: 3886839	
Auckland 0944	Client Reference: 025 DrinkingWater-DFS-SR (May 2026)	
	Add. Client Ref: DWSNZ Compliance – Roof/Rain	
	Submitted By: Na Zhang	

Sample Type: Drinking Water for DWSNZ Compliance

Sample Name:	DrinkingWater-DFS-SR 28-May-2026 1:30 pm	Aesthetic Values	Maximum Acceptable Values (MAV)
Lab Number:	4228758.1		
Routine Water + E.coli profile Kit			
Escherichia coli	MPN / 100mL	< 1	< 1
Routine Water Profile			
Turbidity	NTU	0.15	≤ 5
pH	pH Units	5.7	7.0 - 8.5
Total Alkalinity	g/m ³ as CaCO ₃	2.2	-
Free Carbon Dioxide	g/m ³ at 25°C	8.1	-
Total Hardness	g/m ³ as CaCO ₃	1.7	≤ 200
Electrical Conductivity (EC)	mS/m	1.5	-
Electrical Conductivity (EC)	µS/cm	15	-
Approx Total Dissolved Salts	g/m ³	10	≤ 1000
Total Arsenic	g/m ³	< 0.0011	-
Total Boron	g/m ³	< 0.053	-
Total Calcium	g/m ³	0.26	-
Total Copper	g/m ³	0.052	≤ 1
Total Iron	g/m ³	< 0.021	≤ 0.3
Total Lead	g/m ³	0.00096	-
Total Magnesium	g/m ³	0.25	-
Total Manganese	g/m ³	0.00088	≤ 0.04 (Staining) ≤ 0.10 (Taste)
Total Potassium	g/m ³	0.117	-
Total Sodium	g/m ³	2.0	≤ 200
Total Zinc	g/m ³	0.28	≤ 1.5
Chloride	g/m ³	3.4	≤ 250
Nitrate-N	g/m ³	0.13	-
Sulphate	g/m ³	0.8	≤ 250

Note: The Maximum Acceptable Values (MAV) are taken from the 'Water Services (Drinking Water Standards for New Zealand) Regulations 2022', published under the authority of the New Zealand Government-2022. Copies of this publication are available from: <https://www.legislation.govt.nz/regulation/public/2022/0168/latest/whole.html>

The standards set limits for the concentration of determinands in drinking water. The Maximum Acceptable Values (MAVs) for any determinand must not be exceeded at any time.

The Aesthetic Values are taken the publication, 'Aesthetic Values for Drinking Water Notice 2022' issued by the Water Services Regulator ("Taumata Arowai"). Aesthetic values specify or provide minimum or maximum values for substances and other characteristics that relate to the acceptability of drinking water to consumers (such as appearance, taste or odour).

Note that the units: g/m³ are the same as mg/L and ppm.



This Laboratory is accredited by International Accreditation New Zealand (IANZ), which represents New Zealand in the International Laboratory Accreditation Cooperation (ILAC). Through the ILAC Mutual Recognition Arrangement (ILAC-MRA) this accreditation is internationally recognised. The tests reported herein have been performed in accordance with the terms of accreditation, with the exception of tests marked * or any comments and interpretations, which are not accredited.

pH/Alkalinity and Corrosiveness Assessment

The pH of a water sample is a measure of its acidity or basicity. Waters with a low pH can be corrosive and those with a high pH can promote scale formation in pipes and hot water cylinders.

The guideline level for pH in drinking water is 7.0-8.5. Below this range the water will be corrosive and may cause problems with disinfection if such treatment is used.

The alkalinity of a water is a measure of its acid neutralising capacity and is usually related to the concentration of carbonate, bicarbonate and hydroxide. Low alkalinities (25 g/m^3) promote corrosion and high alkalinities can cause problems with scale formation in metal pipes and tanks.

With the pH and alkalinity levels found it is likely this water will be quite corrosive towards metal piping and fixtures.

Hardness/Total Dissolved Salts Assessment

The water contains a very low amount of dissolved solids and would be regarded as being very soft.

Nitrate Assessment

Nitrate-nitrogen at elevated levels is considered undesirable in natural waters as this element can cause a health disorder called methaemaglobinaemia. Very young infants (less than six months old) are especially vulnerable. The 'Water Services (Drinking Water Standards for New Zealand) Regulations 2022' sets a maximum permissible level of 11.3 g/m^3 as Nitrate-nitrogen (50 g/m^3 as Nitrate).

Nitrate-nitrogen was detected in this water but at such a low level to not be of concern.

Boron Assessment

Boron may be present in natural waters and if present at high concentrations can be toxic to plants.

Boron was not detected in this water.

Metals Assessment

Iron and manganese are two problem elements that commonly occur in natural waters. These elements may cause unsightly stains and produce a brown/black precipitate. Iron is not toxic but manganese, at concentrations above 0.5 g/m^3 , may adversely affect health. At concentrations below this it may cause stains on clothing and sanitary ware.

Iron was not detected in the water

Manganese was found in this water at a low level.

Treatment to remove iron and/or manganese should not be necessary.

Bacteriological Tests

The Drinking Water Standards for NZ state that there should be no Escherichia coli (E coli) in water used for human consumption. The presence of these organisms would indicate that other pathogens of faecal origin may be present. Results obtained for Total Coliforms are only significant if the sample has not also been tested for E coli.

Escherichia coli was not detected in this sample.

Final Assessment

The parameter pH did NOT meet the guidelines laid down in the 'Water Services (Drinking Water Standards for New Zealand) Regulations 2022' and the 'Aesthetic Values for Drinking Water Notice 2022' issued by the Water Services Regulator ("Taumata Arowai") for water which is suitable for drinking purposes.

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request. Unless otherwise indicated, analyses were performed at Hill Labs, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Drinking Water for DWSNZ Compliance			
Test	Method Description	Default Detection Limit	Sample No
Routine Water Profile		-	1
Filtration, Unpreserved	Sample filtration through 0.45µm membrane filter.	-	1
Total Digestion	Nitric acid digestion. APHA 3030 E (modified) : Online Edition.	-	1
Turbidity	Analysis by Mantech PC-1000-1118 Turbidity meter. APHA 2130 B (modified) : Online Edition.	0.05 NTU	1
pH	pH meter. APHA 4500-H ⁺ B (modified) : Online Edition. Note: It is not possible to achieve the APHA Maximum Storage Recommendation for this test (15 min) when samples are analysed upon receipt at the laboratory, and not in the field. Samples and Standards are analysed at an equivalent laboratory temperature (typically 18 to 22 °C). Temperature compensation is used.	0.1 pH Units	1
Total Alkalinity	Titration to pH 4.5 (M-alkalinity), autotitrator. APHA 2320 B (modified for Alkalinity <20) : Online Edition.	1.0 g/m ³ as CaCO ₃	1
Free Carbon Dioxide	Calculation: from alkalinity and pH, valid where TDS is not >500 mg/L and alkalinity is almost entirely due to hydroxides, carbonates or bicarbonates. APHA 4500-CO ₂ D : Online Edition.	1.0 g/m ³ at 25°C	1
Total Hardness	Calculation from Total Calcium and Total Magnesium. APHA 2340 B : Online Edition.	1.0 g/m ³ as CaCO ₃	1
Electrical Conductivity (EC)	Conductivity meter, 25°C. APHA 2510 B : Online Edition.	0.1 mS/m	1
Electrical Conductivity (EC)	Conductivity meter, 25°C. APHA 2510 B : Online Edition.	1 µS/cm	1
Approx Total Dissolved Salts	Calculation: from Electrical Conductivity.	2 g/m ³	1
Total Arsenic	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.0011 g/m ³	1
Total Boron	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.053 g/m ³	1
Total Calcium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.053 g/m ³	1
Total Copper	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.00053 g/m ³	1
Total Iron	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.021 g/m ³	1
Total Lead	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.00011 g/m ³	1
Total Magnesium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.021 g/m ³	1
Total Manganese	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.00053 g/m ³	1
Total Potassium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.053 g/m ³	1
Total Sodium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.021 g/m ³	1
Total Zinc	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.0011 g/m ³	1
Chloride	Filtered sample. Ion Chromatography. APHA 4110 B (modified) : Online Edition.	0.5 g/m ³	1
Nitrate-N	Filtered sample. Ion Chromatography. APHA 4110 B (modified) : Online Edition.	0.05 g/m ³	1
Sulphate	Filtered sample. Ion Chromatography. APHA 4110 B (modified) : Online Edition.	0.5 g/m ³	1
Escherichia coli	MPN count using Colilert (Incubated at 35°C for 24 hours) and 97 wells. APHA 9223 B : Online Edition.	1 MPN / 100mL	1

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Testing was completed between 29-May-2026 and 02-Jun-2026. For completion dates of individual analyses please contact the laboratory.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

This certificate of analysis must not be reproduced, except in full, without the written consent of the signatory.

A handwritten signature in blue ink, appearing to read 'Graham Corban', is positioned above the printed name.

Graham Corban MSc Tech (Hons)
Client Services Manager - Environmental

Certificate of Analysis

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Client:	Waste Management NZ Limited	Lab No:	4228755	DWAPV1
Contact:	Na Zhang C/- Waste Management NZ Limited PO Box 228 Silverdale Auckland 0944	Date Received:	29-May-2026	
		Date Reported:	02-Jun-2026	
		Quote No:	141146	
		Order No:	3886841	
		Client Reference:	026 DrinkingWater-DFS-HR(May 2026)	
		Add. Client Ref:	DWSNZ Compliance – Roof/Rain	
		Submitted By:	Na Zhang	

Sample Type: Drinking Water for DWSNZ Compliance					
Sample Name:		DrinkingWater-DFS-HR 28-May-2026 1:55 pm		Aesthetic Values	Maximum Acceptable Values (MAV)
Lab Number:		4228755.1			
Routine Water + E.coli profile Kit					
Escherichia coli	MPN / 100mL	< 1	-	< 1	
Routine Water Profile					
Turbidity	NTU	0.17	≤ 5	-	
pH	pH Units	6.1	7.0 - 8.5	-	
Total Alkalinity	g/m ³ as CaCO ₃	2.8	-	-	
Free Carbon Dioxide	g/m ³ at 25°C	4.1	-	-	
Total Hardness	g/m ³ as CaCO ₃	1.7	≤ 200	-	
Electrical Conductivity (EC)	mS/m	1.6	-	-	
Electrical Conductivity (EC)	µS/cm	16	-	-	
Approx Total Dissolved Salts	g/m ³	10	≤ 1000	-	
Total Arsenic	g/m ³	< 0.0011	-	0.01	
Total Boron	g/m ³	< 0.053	-	2.4	
Total Calcium	g/m ³	0.27	-	-	
Total Copper	g/m ³	0.060	≤ 1	2	
Total Iron	g/m ³	< 0.021	≤ 0.3	-	
Total Lead	g/m ³	0.00084	-	0.01	
Total Magnesium	g/m ³	0.26	-	-	
Total Manganese	g/m ³	0.00108	≤ 0.04 (Staining) ≤ 0.10 (Taste)	0.4	
Total Potassium	g/m ³	0.118	-	-	
Total Sodium	g/m ³	1.98	≤ 200	-	
Total Zinc	g/m ³	0.29	≤ 1.5	-	
Chloride	g/m ³	3.4	≤ 250	-	
Nitrate-N	g/m ³	0.13	-	11.3	
Sulphate	g/m ³	0.8	≤ 250	-	

Note: The Maximum Acceptable Values (MAV) are taken from the 'Water Services (Drinking Water Standards for New Zealand) Regulations 2022', published under the authority of the New Zealand Government-2022. Copies of this publication are available from: <https://www.legislation.govt.nz/regulation/public/2022/0168/latest/whole.html>

The standards set limits for the concentration of determinands in drinking water. The Maximum Acceptable Values (MAVs) for any determinand must not be exceeded at any time.

The Aesthetic Values are taken the publication, 'Aesthetic Values for Drinking Water Notice 2022' issued by the Water Services Regulator ("Taumata Arowai"). Aesthetic values specify or provide minimum or maximum values for substances and other characteristics that relate to the acceptability of drinking water to consumers (such as appearance, taste or odour).

Note that the units: g/m³ are the same as mg/L and ppm.



This Laboratory is accredited by International Accreditation New Zealand (IANZ), which represents New Zealand in the International Laboratory Accreditation Cooperation (ILAC). Through the ILAC Mutual Recognition Arrangement (ILAC-MRA) this accreditation is internationally recognised. The tests reported herein have been performed in accordance with the terms of accreditation, with the exception of tests marked * or any comments and interpretations, which are not accredited.

pH/Alkalinity and Corrosiveness Assessment

The pH of a water sample is a measure of its acidity or basicity. Waters with a low pH can be corrosive and those with a high pH can promote scale formation in pipes and hot water cylinders.

The guideline level for pH in drinking water is 7.0-8.5. Below this range the water will be corrosive and may cause problems with disinfection if such treatment is used.

The alkalinity of a water is a measure of its acid neutralising capacity and is usually related to the concentration of carbonate, bicarbonate and hydroxide. Low alkalinities (25 g/m^3) promote corrosion and high alkalinities can cause problems with scale formation in metal pipes and tanks.

With the pH and alkalinity levels found, this water could be corrosive towards metal piping and fixtures.

Hardness/Total Dissolved Salts Assessment

The water contains a very low amount of dissolved solids and would be regarded as being very soft.

Nitrate Assessment

Nitrate-nitrogen at elevated levels is considered undesirable in natural waters as this element can cause a health disorder called methaemaglobinaemia. Very young infants (less than six months old) are especially vulnerable. The 'Water Services (Drinking Water Standards for New Zealand) Regulations 2022' sets a maximum permissible level of 11.3 g/m^3 as Nitrate-nitrogen (50 g/m^3 as Nitrate).

Nitrate-nitrogen was detected in this water but at such a low level to not be of concern.

Boron Assessment

Boron may be present in natural waters and if present at high concentrations can be toxic to plants.

Boron was not detected in this water.

Metals Assessment

Iron and manganese are two problem elements that commonly occur in natural waters. These elements may cause unsightly stains and produce a brown/black precipitate. Iron is not toxic but manganese, at concentrations above 0.5 g/m^3 , may adversely affect health. At concentrations below this it may cause stains on clothing and sanitary ware.

Iron was not detected in the water

Manganese was found in this water at a low level.

Treatment to remove iron and/or manganese should not be necessary.

Bacteriological Tests

The Drinking Water Standards for NZ state that there should be no Escherichia coli (E coli) in water used for human consumption. The presence of these organisms would indicate that other pathogens of faecal origin may be present. Results obtained for Total Coliforms are only significant if the sample has not also been tested for E coli.

Escherichia coli was not detected in this sample.

Final Assessment

The parameter pH did NOT meet the guidelines laid down in the 'Water Services (Drinking Water Standards for New Zealand) Regulations 2022' and the 'Aesthetic Values for Drinking Water Notice 2022' issued by the Water Services Regulator ("Taumata Arowai") for water which is suitable for drinking purposes.

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request. Unless otherwise indicated, analyses were performed at Hill Labs, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Drinking Water for DWSNZ Compliance			
Test	Method Description	Default Detection Limit	Sample No
Routine Water Profile		-	1
Filtration, Unpreserved	Sample filtration through 0.45µm membrane filter.	-	1
Total Digestion	Nitric acid digestion. APHA 3030 E (modified) : Online Edition.	-	1
Turbidity	Analysis by Mantech PC-1000-1118 Turbidity meter. APHA 2130 B (modified) : Online Edition.	0.05 NTU	1
pH	pH meter. APHA 4500-H ⁺ B (modified) : Online Edition. Note: It is not possible to achieve the APHA Maximum Storage Recommendation for this test (15 min) when samples are analysed upon receipt at the laboratory, and not in the field. Samples and Standards are analysed at an equivalent laboratory temperature (typically 18 to 22 °C). Temperature compensation is used.	0.1 pH Units	1
Total Alkalinity	Titration to pH 4.5 (M-alkalinity), autotitrator. APHA 2320 B (modified for Alkalinity <20) : Online Edition.	1.0 g/m ³ as CaCO ₃	1
Free Carbon Dioxide	Calculation: from alkalinity and pH, valid where TDS is not >500 mg/L and alkalinity is almost entirely due to hydroxides, carbonates or bicarbonates. APHA 4500-CO ₂ D : Online Edition.	1.0 g/m ³ at 25°C	1
Total Hardness	Calculation from Total Calcium and Total Magnesium. APHA 2340 B : Online Edition.	1.0 g/m ³ as CaCO ₃	1
Electrical Conductivity (EC)	Conductivity meter, 25°C. APHA 2510 B : Online Edition.	0.1 mS/m	1
Electrical Conductivity (EC)	Conductivity meter, 25°C. APHA 2510 B : Online Edition.	1 µS/cm	1
Approx Total Dissolved Salts	Calculation: from Electrical Conductivity.	2 g/m ³	1
Total Arsenic	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.0011 g/m ³	1
Total Boron	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.053 g/m ³	1
Total Calcium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.053 g/m ³	1
Total Copper	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.00053 g/m ³	1
Total Iron	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.021 g/m ³	1
Total Lead	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.00011 g/m ³	1
Total Magnesium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.021 g/m ³	1
Total Manganese	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.00053 g/m ³	1
Total Potassium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.053 g/m ³	1
Total Sodium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.021 g/m ³	1
Total Zinc	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.0011 g/m ³	1
Chloride	Filtered sample. Ion Chromatography. APHA 4110 B (modified) : Online Edition.	0.5 g/m ³	1
Nitrate-N	Filtered sample. Ion Chromatography. APHA 4110 B (modified) : Online Edition.	0.05 g/m ³	1
Sulphate	Filtered sample. Ion Chromatography. APHA 4110 B (modified) : Online Edition.	0.5 g/m ³	1
Escherichia coli	MPN count using Colilert (Incubated at 35°C for 24 hours) and 97 wells. APHA 9223 B : Online Edition.	1 MPN / 100mL	1

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Testing was completed between 29-May-2026 and 02-Jun-2026. For completion dates of individual analyses please contact the laboratory.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

This certificate of analysis must not be reproduced, except in full, without the written consent of the signatory.

A handwritten signature in blue ink, appearing to read 'Graham Corban', is positioned above the printed name.

Graham Corban MSc Tech (Hons)
Client Services Manager - Environmental

Certificate of Analysis

Page 1 of 3

Client:	Waste Management NZ Limited	Lab No:	4228765	DWMAVUPv1
Contact:	Na Zhang C/- Waste Management NZ Limited PO Box 228 Silverdale Auckland 0944	Date Received:	29-May-2026	
		Date Reported:	04-Jun-2026	
		Quote No:	141146	
		Order No:	3886842	
		Client Reference:	027 DrinkingWater-DFS-HK (May 2026)	
		Add. Client Ref:	Routine Water + E. coli	
		Submitted By:	Na Zhang	

Sample Type: Drinking Water for DWSNZ Compliance

Sample Name:		027 DrinkingWater-DFS-HK 28-May-2026 2:00 pm	Maximum Acceptable Value	Outside Limits
Lab Number:		4228765.1		
Routine Water + E.coli profile Kit				
Escherichia coli	MPN / 100mL	< 1	< 1	No
Routine Water Profile				
Turbidity	NTU	0.073 ± 0.034	-	-
pH	pH Units	5.7 ± 0.2	-	-
Total Alkalinity	g/m ³ as CaCO ₃	2.20 ± 0.67	-	-
Free Carbon Dioxide	g/m ³ at 25°C	8.7 ± 5.2	-	-
Total Hardness	g/m ³ as CaCO ₃	1.74 ± 0.14	-	-
Electrical Conductivity (EC)	mS/m	1.5 ± 0.1	-	-
Electrical Conductivity (EC)	µS/cm	15 ± 1	-	-
Approx Total Dissolved Salts	g/m ³	9.83 ± 0.45	-	-
Total Arsenic	g/m ³	< 0.0011 ± 0.00074	0.01	No
Total Boron	g/m ³	< 0.053 ± 0.036	2.4	No
Total Calcium	g/m ³	0.298 ± 0.038	-	-
Total Copper	g/m ³	0.00365 ± 0.00051	2	No
Total Iron	g/m ³	< 0.021 ± 0.014	-	-
Total Lead	g/m ³	0.000331 ± 0.000076	0.01	No
Total Magnesium	g/m ³	0.241 ± 0.024	-	-
Total Manganese	g/m ³	0.00146 ± 0.00038	0.4	No
Total Potassium	g/m ³	0.118 ± 0.036	-	-
Total Sodium	g/m ³	2.01 ± 0.13	-	-
Total Zinc	g/m ³	0.274 ± 0.022	-	-
Chloride	g/m ³	3.37 ± 0.40	-	-
Nitrate-N	g/m ³	0.120 ± 0.043	11.3	No
Sulphate	g/m ³	0.74 ± 0.35	-	-

Note: The Maximum Acceptable Values (MAV) are taken from the 'Water Services (Drinking Water Standards for New Zealand) Regulations 2022', published under the authority of the New Zealand Government-2022. Copies of this publication are available from: <https://www.legislation.govt.nz/regulation/public/2022/0168/latest/whole.html>

The standards set limits for the concentration of determinands in drinking water. The Maximum Acceptable Values (MAVs) for any determinand must not be exceeded at any time.

Under Section 73 (2) of the Water Services Act 2021, the laboratory is required to report the results of any analysis or test carried out (for the purposes of testing for compliance with the Drinking Water Standards for New Zealand 2022) that indicates any non-compliance (transgression) with the Maximum Acceptable Values (MAVs) to Taumata Arowai, the water services regulator for Aotearoa.

Taumata Arowai also publishes 'Aesthetic Values for Drinking Water Notice 2022' which specifies or provides minimum or maximum values for substances and other characteristics that relate to the acceptability of drinking water to consumers (such as appearance, taste or odour). This report compares the results obtained with the Maximum Acceptable Values only.

The reported uncertainty is an expanded uncertainty with a level of confidence of approximately 95 percent (i.e. two standard deviations, calculated using a coverage factor of 2). Reported uncertainties are calculated from the performance of typical matrices, and do not include variation due to sampling. For further information on uncertainty of measurement at Hill Laboratories, refer to the technical note on our website: www.hill-laboratories.com/files/Intro_To_UOM.pdf, or contact the laboratory.

Note that the units: g/m³ are the same as mg/L and ppm.

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request. Unless otherwise indicated, analyses were performed at Hill Labs, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Drinking Water for DWSNZ Compliance			
Test	Method Description	Default Detection Limit	Sample No
Routine Water Profile		-	1
Filtration, Unpreserved	Sample filtration through 0.45µm membrane filter.	-	1
Total Digestion	Nitric acid digestion. APHA 3030 E (modified) : Online Edition.	-	1
Turbidity	Analysis by Mantech PC-1000-1118 Turbidity meter. APHA 2130 B (modified) : Online Edition.	0.05 NTU	1
pH	pH meter. APHA 4500-H ⁺ B (modified) : Online Edition. Note: It is not possible to achieve the APHA Maximum Storage Recommendation for this test (15 min) when samples are analysed upon receipt at the laboratory, and not in the field. Samples and Standards are analysed at an equivalent laboratory temperature (typically 18 to 22 °C). Temperature compensation is used.	0.1 pH Units	1
Total Alkalinity	Titration to pH 4.5 (M-alkalinity), autotitrator. APHA 2320 B (modified for Alkalinity <20) : Online Edition.	1.0 g/m ³ as CaCO ₃	1
Free Carbon Dioxide	Calculation: from alkalinity and pH, valid where TDS is not >500 mg/L and alkalinity is almost entirely due to hydroxides, carbonates or bicarbonates. APHA 4500-CO ₂ D : Online Edition.	1.0 g/m ³ at 25°C	1
Total Hardness	Calculation from Total Calcium and Total Magnesium. APHA 2340 B : Online Edition.	1.0 g/m ³ as CaCO ₃	1
Electrical Conductivity (EC)	Conductivity meter, 25°C. APHA 2510 B : Online Edition.	0.1 mS/m	1
Electrical Conductivity (EC)	Conductivity meter, 25°C. APHA 2510 B : Online Edition.	1 µS/cm	1
Approx Total Dissolved Salts	Calculation: from Electrical Conductivity.	2 g/m ³	1
Total Arsenic	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.0011 g/m ³	1
Total Boron	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.053 g/m ³	1
Total Calcium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.053 g/m ³	1
Total Copper	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.00053 g/m ³	1
Total Iron	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.021 g/m ³	1
Total Lead	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.00011 g/m ³	1
Total Magnesium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.021 g/m ³	1
Total Manganese	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.00053 g/m ³	1
Total Potassium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.053 g/m ³	1

Sample Type: Drinking Water for DWSNZ Compliance			
Test	Method Description	Default Detection Limit	Sample No
Total Sodium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.021 g/m ³	1
Total Zinc	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B : Online Edition.	0.0011 g/m ³	1
Chloride	Filtered sample. Ion Chromatography. APHA 4110 B (modified) : Online Edition.	0.5 g/m ³	1
Nitrate-N	Filtered sample. Ion Chromatography. APHA 4110 B (modified) : Online Edition.	0.05 g/m ³	1
Sulphate	Filtered sample. Ion Chromatography. APHA 4110 B (modified) : Online Edition.	0.5 g/m ³	1
Escherichia coli	MPN count using Colilert (Incubated at 35°C for 24 hours) and 97 wells. APHA 9223 B : Online Edition.	1 MPN / 100mL	1

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Testing was completed between 29-May-2026 and 04-Jun-2026. For completion dates of individual analyses please contact the laboratory.

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Ara Heron BSc (Tech)
Client Services Manager - Environmental