



## Certificate of Analysis

<b>Client:</b>	Marlborough District Council	<b>Lab No:</b>	2875669	DWUPV1
<b>Contact:</b>	Marlborough District Council - Assets & Services Dept C/- Marlborough District Council PO Box 443 Blenheim 7240	<b>Date Received:</b>	16-Feb-2022	
		<b>Date Reported:</b>	24-Feb-2022	
		<b>Quote No:</b>	116119	
		<b>Order No:</b>	CHU51493	
		<b>Client Reference:</b>	S3 Rules: Blenheim Annual Source Water Marlborough District Council - Assets & Services Department	
		<b>Submitted By:</b>		

### Sample Type: Drinking Water for DWSNZ Compliance

	Sample Name:	20221082 - DWB-200: Bomford St No. 1 Well G01092 16-Feb-2022 9:00 am	20221083 - DWB-201: Central No. 1 Well G02132 16-Feb-2022 8:45 am	Guideline Value	Maximum Acceptable Values (MAV)
	Lab Number:	2875669.1	2875669.2		
Total Alkalinity	g/m <sup>3</sup> as CaCO <sub>3</sub>	41.2 ± 1.8	43.2 ± 1.9	-	-
Total Antimony	g/m <sup>3</sup>	< 0.00021 ± 0.00014	< 0.00021 ± 0.00014	-	0.02
Total Arsenic	g/m <sup>3</sup>	< 0.0011 ± 0.00074	< 0.0011 ± 0.00074	-	0.01
Total Barium	g/m <sup>3</sup>	0.0146 ± 0.0012	0.01227 ± 0.0010	-	0.7
Total Boron	g/m <sup>3</sup>	0.0298 ± 0.0055	0.0337 ± 0.0059	-	1.4
Total Cadmium	g/m <sup>3</sup>	< 0.000053 ± 0.000036	< 0.000053 ± 0.000036	-	0.004
Total Calcium	g/m <sup>3</sup>	13.16 ± 0.53	13.57 ± 0.55	-	-
Total Chromium	g/m <sup>3</sup>	< 0.00053 ± 0.00036	< 0.00053 ± 0.00036	-	0.05
Total Copper	g/m <sup>3</sup>	0.00378 ± 0.00052	0.00177 ± 0.00040	< 1	2
Total Lead	g/m <sup>3</sup>	0.000170 ± 0.000074	0.000428 ± 0.000078	-	0.01
Total Magnesium	g/m <sup>3</sup>	3.53 ± 0.29	3.73 ± 0.30	-	-
Total Mercury	g/m <sup>3</sup>	< 0.00008 ± 0.000053	< 0.00008 ± 0.000053	-	0.007
Total Nickel	g/m <sup>3</sup>	0.00154 ± 0.00040	0.00258 ± 0.00047	-	0.08
Total Potassium	g/m <sup>3</sup>	1.011 ± 0.071	1.010 ± 0.071	-	-
Chloride	g/m <sup>3</sup>	6.17 ± 0.45	6.38 ± 0.46	< 250	-
Fluoride	g/m <sup>3</sup>	0.060 ± 0.041	0.070 ± 0.041	-	1.5
Nitrite-N	g/m <sup>3</sup>	< 0.002 ± 0.0014	< 0.002 ± 0.0014	-	0.06 0.91 (short term)
Nitrite	g/m <sup>3</sup>	< 0.007	< 0.007	-	0.2 3 (short term)
Nitrate-N	g/m <sup>3</sup>	1.11 ± 0.14	1.05 ± 0.13	-	11.3
Nitrate-N + Nitrite-N	g/m <sup>3</sup>	1.11 ± 0.14	1.05 ± 0.13	-	-
Nitrate	g/m <sup>3</sup>	4.91 ± 0.59	4.66 ± 0.56	-	50
Sulphate	g/m <sup>3</sup>	12.04 ± 0.87	11.77 ± 0.86	< 250	-



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.

**Sample Type: Drinking Water for DWSNZ Compliance**

<b>Sample Name:</b>		20221084 - DWB-202: Grove Rd No. 1 Well G00330 16-Feb-2022 9:25 am	20221085 - DWB-203: Grove Rd No. 2 Well G00335 16-Feb-2022 9:40 am	<b>Guideline Value</b>	<b>Maximum Acceptable Values (MAV)</b>
<b>Lab Number:</b>		2875669.3	2875669.4		
Total Alkalinity	g/m <sup>3</sup> as CaCO <sub>3</sub>	40.7 ± 1.8	40.5 ± 1.8	-	-
Total Antimony	g/m <sup>3</sup>	< 0.00021 ± 0.00014	< 0.00021 ± 0.00014	-	0.02
Total Arsenic	g/m <sup>3</sup>	< 0.0011 ± 0.00074	< 0.0011 ± 0.00074	-	0.01
Total Barium	g/m <sup>3</sup>	0.0151 ± 0.0013	0.0150 ± 0.0013	-	0.7
Total Boron	g/m <sup>3</sup>	0.0299 ± 0.0055	0.0309 ± 0.0056	-	1.4
Total Cadmium	g/m <sup>3</sup>	< 0.000053 ± 0.000036	< 0.000053 ± 0.000036	-	0.004
Total Calcium	g/m <sup>3</sup>	13.58 ± 0.55	13.42 ± 0.54	-	-
Total Chromium	g/m <sup>3</sup>	< 0.00053 ± 0.00036	< 0.00053 ± 0.00036	-	0.05
Total Copper	g/m <sup>3</sup>	0.00926 ± 0.00099	0.00543 ± 0.00065	< 1	2
Total Lead	g/m <sup>3</sup>	0.000527 ± 0.000080	0.000867 ± 0.000090	-	0.01
Total Magnesium	g/m <sup>3</sup>	3.56 ± 0.29	3.68 ± 0.30	-	-
Total Mercury	g/m <sup>3</sup>	< 0.00008 ± 0.000053	< 0.00008 ± 0.000053	-	0.007
Total Nickel	g/m <sup>3</sup>	0.00364 ± 0.00056	0.00255 ± 0.00047	-	0.08
Total Potassium	g/m <sup>3</sup>	1.023 ± 0.071	1.004 ± 0.070	-	-
Chloride	g/m <sup>3</sup>	6.02 ± 0.44	6.03 ± 0.44	< 250	-
Fluoride	g/m <sup>3</sup>	0.050 ± 0.041	0.054 ± 0.041	-	1.5
Nitrite-N	g/m <sup>3</sup>	< 0.002 ± 0.0014	< 0.002 ± 0.0014	-	0.06 0.91 (short term)
Nitrite	g/m <sup>3</sup>	< 0.007	< 0.007	-	0.2 3 (short term)
Nitrate-N	g/m <sup>3</sup>	1.04 ± 0.13	1.05 ± 0.13	-	11.3
Nitrate-N + Nitrite-N	g/m <sup>3</sup>	1.04 ± 0.13	1.05 ± 0.13	-	-
Nitrate	g/m <sup>3</sup>	4.59 ± 0.56	4.65 ± 0.56	-	50
Sulphate	g/m <sup>3</sup>	12.12 ± 0.88	12.23 ± 0.89	< 250	-

**Sample Type: Drinking Water for DWSNZ Compliance**

<b>Sample Name:</b>		20221086 - DWB-204: Grove Rd No. 3 Well G01095 16-Feb-2022 9:50 am	20221087 - DWB-205: Grove Rd No. 4 Well G01964 16-Feb-2022 9:45 am	<b>Guideline Value</b>	<b>Maximum Acceptable Values (MAV)</b>
<b>Lab Number:</b>		2875669.5	2875669.6		
Total Alkalinity	g/m <sup>3</sup> as CaCO <sub>3</sub>	41.4 ± 1.8	40.8 ± 1.8	-	-
Total Antimony	g/m <sup>3</sup>	< 0.00021 ± 0.00014	< 0.00021 ± 0.00014	-	0.02
Total Arsenic	g/m <sup>3</sup>	< 0.0011 ± 0.00074	< 0.0011 ± 0.00074	-	0.01
Total Barium	g/m <sup>3</sup>	0.0149 ± 0.0012	0.0132 ± 0.0011	-	0.7
Total Boron	g/m <sup>3</sup>	0.0297 ± 0.0055	0.0293 ± 0.0054	-	1.4
Total Cadmium	g/m <sup>3</sup>	< 0.000053 ± 0.000036	< 0.000053 ± 0.000036	-	0.004
Total Calcium	g/m <sup>3</sup>	13.45 ± 0.54	13.38 ± 0.54	-	-
Total Chromium	g/m <sup>3</sup>	< 0.00053 ± 0.00036	< 0.00053 ± 0.00036	-	0.05
Total Copper	g/m <sup>3</sup>	0.00281 ± 0.00045	0.00102 ± 0.00037	< 1	2
Total Lead	g/m <sup>3</sup>	< 0.00011 ± 0.000074	0.000112 ± 0.000074	-	0.01
Total Magnesium	g/m <sup>3</sup>	3.61 ± 0.29	3.50 ± 0.29	-	-
Total Mercury	g/m <sup>3</sup>	< 0.00008 ± 0.000053	< 0.00008 ± 0.000053	-	0.007
Total Nickel	g/m <sup>3</sup>	< 0.00053 ± 0.00036	< 0.00053 ± 0.00036	-	0.08
Total Potassium	g/m <sup>3</sup>	1.007 ± 0.070	1.006 ± 0.070	-	-
Chloride	g/m <sup>3</sup>	5.99 ± 0.44	6.01 ± 0.44	< 250	-
Fluoride	g/m <sup>3</sup>	0.052 ± 0.041	0.050 ± 0.041	-	1.5
Nitrite-N	g/m <sup>3</sup>	< 0.002 ± 0.0014	< 0.002 ± 0.0014	-	0.06 0.91 (short term)
Nitrite	g/m <sup>3</sup>	< 0.007	< 0.007	-	0.2 3 (short term)
Nitrate-N	g/m <sup>3</sup>	1.09 ± 0.14	1.08 ± 0.13	-	11.3
Nitrate-N + Nitrite-N	g/m <sup>3</sup>	1.09 ± 0.14	1.08 ± 0.13	-	-
Nitrate	g/m <sup>3</sup>	4.83 ± 0.59	4.77 ± 0.58	-	50
Sulphate	g/m <sup>3</sup>	11.96 ± 0.87	11.67 ± 0.85	< 250	-

**Sample Type: Drinking Water for DWSNZ Compliance**

<b>Sample Name:</b>		20221088 - DWB-206: Middle Renwick Rd No. 1 Well G00331 16-Feb-2022 10:55 am	20221089 - DWB-207: Middle Renwick Rd No. 2 Well G01093 16-Feb-2022 10:45 am	<b>Guideline Value</b>	<b>Maximum Acceptable Values (MAV)</b>
<b>Lab Number:</b>		2875669.7	2875669.8		
Total Alkalinity	g/m <sup>3</sup> as CaCO <sub>3</sub>	42.3 ± 1.9	41.9 ± 1.9	-	-
Total Antimony	g/m <sup>3</sup>	< 0.00021 ± 0.00014	< 0.00021 ± 0.00014	-	0.02
Total Arsenic	g/m <sup>3</sup>	< 0.0011 ± 0.00074	< 0.0011 ± 0.00074	-	0.01
Total Barium	g/m <sup>3</sup>	0.0201 ± 0.0017	0.0201 ± 0.0017	-	0.7
Total Boron	g/m <sup>3</sup>	0.0376 ± 0.0063	0.0374 ± 0.0063	-	1.4
Total Cadmium	g/m <sup>3</sup>	< 0.000053 ± 0.000036	0.000055 ± 0.000036	-	0.004
Total Calcium	g/m <sup>3</sup>	13.29 ± 0.54	12.99 ± 0.53	-	-
Total Chromium	g/m <sup>3</sup>	< 0.00053 ± 0.00036	< 0.00053 ± 0.00036	-	0.05
Total Copper	g/m <sup>3</sup>	0.00616 ± 0.00071	0.0955 ± 0.0096	< 1	2
Total Lead	g/m <sup>3</sup>	0.000269 ± 0.000075	0.000132 ± 0.000074	-	0.01
Total Magnesium	g/m <sup>3</sup>	3.37 ± 0.27	3.29 ± 0.27	-	-
Total Mercury	g/m <sup>3</sup>	< 0.00008 ± 0.000053	< 0.00008 ± 0.000053	-	0.007
Total Nickel	g/m <sup>3</sup>	0.00138 ± 0.00039	0.00184 ± 0.00042	-	0.08
Total Potassium	g/m <sup>3</sup>	0.996 ± 0.070	0.995 ± 0.070	-	-
Chloride	g/m <sup>3</sup>	4.87 ± 0.41	4.88 ± 0.41	< 250	-
Fluoride	g/m <sup>3</sup>	0.082 ± 0.042	0.084 ± 0.042	-	1.5
Nitrite-N	g/m <sup>3</sup>	< 0.002 ± 0.0014	< 0.002 ± 0.0014	-	0.06 0.91 (short term)
Nitrite	g/m <sup>3</sup>	< 0.007	< 0.007	-	0.2 3 (short term)
Nitrate-N	g/m <sup>3</sup>	0.85 ± 0.11	0.811 ± 0.098	-	11.3
Nitrate-N + Nitrite-N	g/m <sup>3</sup>	0.85 ± 0.11	0.811 ± 0.098	-	-
Nitrate	g/m <sup>3</sup>	3.77 ± 0.46	3.59 ± 0.44	-	50
Sulphate	g/m <sup>3</sup>	13.45 ± 0.96	13.68 ± 0.98	< 250	-

Sample Type: Drinking Water for DWSNZ Compliance				
Sample Name:	20221090 - DWB-208: Middle Renwick Rd No. 3 Well G01094 16-Feb-2022 10:30 am		Guideline Value	Maximum Acceptable Values (MAV)
Lab Number:	2875669.9			
Total Alkalinity	g/m <sup>3</sup> as CaCO <sub>3</sub>	42.0 ± 1.9	-	-
Total Antimony	g/m <sup>3</sup>	< 0.00021 ± 0.00014	-	0.02
Total Arsenic	g/m <sup>3</sup>	< 0.0011 ± 0.00074	-	0.01
Total Barium	g/m <sup>3</sup>	0.0200 ± 0.0017	-	0.7
Total Boron	g/m <sup>3</sup>	0.0379 ± 0.0064	-	1.4
Total Cadmium	g/m <sup>3</sup>	< 0.000053 ± 0.000036	-	0.004
Total Calcium	g/m <sup>3</sup>	13.08 ± 0.53	-	-
Total Chromium	g/m <sup>3</sup>	< 0.00053 ± 0.00036	-	0.05
Total Copper	g/m <sup>3</sup>	0.00784 ± 0.00086	< 1	2
Total Lead	g/m <sup>3</sup>	0.000892 ± 0.000091	-	0.01
Total Magnesium	g/m <sup>3</sup>	3.44 ± 0.28	-	-
Total Mercury	g/m <sup>3</sup>	< 0.00008 ± 0.000053	-	0.007
Total Nickel	g/m <sup>3</sup>	0.00304 ± 0.00051	-	0.08
Total Potassium	g/m <sup>3</sup>	0.973 ± 0.069	-	-
Chloride	g/m <sup>3</sup>	4.93 ± 0.41	< 250	-
Fluoride	g/m <sup>3</sup>	0.082 ± 0.042	-	1.5
Nitrite-N	g/m <sup>3</sup>	< 0.002 ± 0.0014	-	0.06 0.91 (short term)
Nitrite	g/m <sup>3</sup>	< 0.007	-	0.2 3 (short term)
Nitrate-N	g/m <sup>3</sup>	0.798 ± 0.096	-	11.3
Nitrate-N + Nitrite-N	g/m <sup>3</sup>	0.799 ± 0.096	-	-
Nitrate	g/m <sup>3</sup>	3.54 ± 0.43	-	50
Sulphate	g/m <sup>3</sup>	13.50 ± 0.96	< 250	-

**Note:** The Guideline Values and Maximum Acceptable Values (MAV) are taken from the publication 'Drinking-water Standards for New Zealand 2005 (Revised 2018)', Ministry of Health. Copies of this publication are available from <https://www.health.govt.nz/publication/drinking-water-standards-new-zealand-2005-revised-2018>

The Maximum Acceptable Values (MAVs) have been defined by the Ministry of Health for parameters of health significance and should not be exceeded. The Guideline Values are the limits for aesthetic determinands that, if exceeded, may render the water unattractive to consumers.

**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 New Zealand Drinking Water Standards 2005 (Revised 2018)) that indicates any non-compliance (transgression) with the Maximum Acceptable Values (MAVs) to Taumata Arowai, the water services regulator for Aotearoa.**

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](http://www.hill-laboratories.com/files/Intro_To_UOM.pdf), or contact the laboratory.

Note that the units g/m<sup>3</sup> 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 Laboratories, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Drinking Water for DWSNZ Compliance			
Test	Method Description	Default Detection Limit	Sample No
Filtration, Unpreserved	Sample filtration through 0.45µm membrane filter. Performed at Hill Laboratories - Chemistry; 101c Waterloo Road, Christchurch.	-	1-9
Total Digestion	Nitric acid digestion. APHA 3030 E (modified) 23 <sup>rd</sup> ed. 2017.	-	1-9
Total Alkalinity	Titration to pH 4.5 (M-alkalinity), autotitrator. Analysed at Hill Laboratories - Chemistry; 101c Waterloo Road, Christchurch. APHA 2320 B (modified for Alkalinity <20) 23 <sup>rd</sup> ed. 2017.	1.0 g/m <sup>3</sup> as CaCO <sub>3</sub>	1-9
Total Antimony	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 <sup>rd</sup> ed. 2017 / US EPA 200.8.	0.00021 g/m <sup>3</sup>	1-9
Total Arsenic	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 <sup>rd</sup> ed. 2017 / US EPA 200.8.	0.0011 g/m <sup>3</sup>	1-9
Total Barium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 <sup>rd</sup> ed. 2017 / US EPA 200.8.	0.0053 g/m <sup>3</sup>	1-9

Sample Type: Drinking Water for DWSNZ Compliance			
Test	Method Description	Default Detection Limit	Sample No
Total Boron	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 <sup>rd</sup> ed. 2017.	0.0053 g/m <sup>3</sup>	1-9
Total Cadmium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 <sup>rd</sup> ed. 2017 / US EPA 200.8.	0.000053 g/m <sup>3</sup>	1-9
Total Calcium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 <sup>rd</sup> ed. 2017.	0.053 g/m <sup>3</sup>	1-9
Total Chromium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 <sup>rd</sup> ed. 2017 / US EPA 200.8.	0.00053 g/m <sup>3</sup>	1-9
Total Copper	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 <sup>rd</sup> ed. 2017 / US EPA 200.8.	0.00053 g/m <sup>3</sup>	1-9
Total Lead	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 <sup>rd</sup> ed. 2017 / US EPA 200.8.	0.00011 g/m <sup>3</sup>	1-9
Total Magnesium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 <sup>rd</sup> ed. 2017.	0.021 g/m <sup>3</sup>	1-9
Total Mercury	Bromine Oxidation followed by Atomic Fluorescence. US EPA Method 245.7, Feb 2005.	0.00008 g/m <sup>3</sup>	1-9
Total Nickel	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 <sup>rd</sup> ed. 2017 / US EPA 200.8.	0.00053 g/m <sup>3</sup>	1-9
Total Potassium	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 <sup>rd</sup> ed. 2017.	0.053 g/m <sup>3</sup>	1-9
Chloride	Filtered sample from Christchurch. Ion Chromatography. APHA 4110 B (modified) 23 <sup>rd</sup> ed. 2017.	0.5 g/m <sup>3</sup>	1-9
Fluoride	Direct measurement, ion selective electrode. APHA 4500-F- C 23 <sup>rd</sup> ed. 2017.	0.05 g/m <sup>3</sup>	1-9
Nitrite-N	Filtered sample from Christchurch. Automated Azo dye colorimetry, Flow injection analyser. APHA 4500-NO <sub>2</sub> <sup>-</sup> I (modified) 23 <sup>rd</sup> ed. 2017.	0.002 g/m <sup>3</sup>	1-9
Nitrite	Calculation from Nitrite-N.	0.004 g/m <sup>3</sup>	1-9
Nitrate-N	Calculation: (Nitrate-N + Nitrite-N) - NO <sub>2</sub> N. In-House.	0.0010 g/m <sup>3</sup>	1-9
Nitrate-N + Nitrite-N	Filtered sample from Christchurch. Total oxidised nitrogen. Automated cadmium reduction, flow injection analyser. APHA 4500-NO <sub>3</sub> <sup>-</sup> I (modified) 23 <sup>rd</sup> ed. 2017.	0.002 g/m <sup>3</sup>	1-9
Nitrate	Calculation from Nitrate-N.	0.005 g/m <sup>3</sup>	1-9
Sulphate	Filtered sample from Christchurch. Ion Chromatography. APHA 4110 B (modified) 23 <sup>rd</sup> ed. 2017.	0.5 g/m <sup>3</sup>	1-9

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

Testing was completed between 18-Feb-2022 and 24-Feb-2022. 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.

Ara Heron BSc (Tech)  
Client Services Manager - Environmental



## Certificate of Analysis

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<b>Client:</b>	Marlborough District Council	<b>Lab No:</b>	2851574	DWUPV1
<b>Contact:</b>	Marlborough District Council - Assets & Services Dept C/- Marlborough District Council PO Box 443 Blenheim 7240	<b>Date Received:</b>	02-Feb-2022	
		<b>Date Reported:</b>	11-Feb-2022	
		<b>Quote No:</b>	116107	
		<b>Order No:</b>	51493 Chu	
		<b>Client Reference:</b>	S3 Rules: Blenheim Monthly Source Water Marlborough District Council - Assets & Services Department	
		<b>Submitted By:</b>		

### Sample Type: Drinking Water for DWSNZ Compliance

Sample Name:		20220946 - DWB-200: Bomford St No. 1 Well 02-Feb-2022 8:45 am	20220947 - DWB-201: Central No. 1 Well 02-Feb-2022 8:35 am	Guideline Value	Maximum Acceptable Values (MAV)
Lab Number:		2851574.1	2851574.2		
pH	pH Units	7.6 ± 0.2	7.6 ± 0.2	7.0 - 8.5	-
Electrical Conductivity (EC)	mS/m	13.8 ± 0.3	14.1 ± 0.3	-	-
Total Iron	g/m <sup>3</sup>	< 0.021 ± 0.014	< 0.021 ± 0.014	< 0.2	-
Total Manganese	g/m <sup>3</sup>	< 0.00053 ± 0.00036	< 0.00053 ± 0.00036	< 0.04 (Staining) < 0.10 (Taste)	0.4
Bromide	g/m <sup>3</sup>	< 0.05 ± 0.041	< 0.05 ± 0.041	-	-
Chloride	g/m <sup>3</sup>	6.54 ± 0.46	6.44 ± 0.46	< 250	-
Nitrite-N	g/m <sup>3</sup>	< 0.002 ± 0.0014	< 0.002 ± 0.0014	-	0.06 0.91 (short term)
Nitrite	g/m <sup>3</sup>	< 0.007	< 0.007	-	0.2 3 (short term)
Nitrate-N	g/m <sup>3</sup>	1.13 ± 0.14	1.07 ± 0.13	-	11.3
Nitrate-N + Nitrite-N	g/m <sup>3</sup>	1.13 ± 0.14	1.07 ± 0.13	-	-
Nitrate	g/m <sup>3</sup>	4.98 ± 0.60	4.73 ± 0.57	-	50
Total Organic Carbon (TOC)	g/m <sup>3</sup>	0.9 ± 2.9	1.3 ± 2.9	-	-



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.

**Sample Type: Drinking Water for DWSNZ Compliance**

<b>Sample Name:</b>		20220949 - DWB-203: Grove Rd No. 2 Well 02-Feb-2022 8:55 am	20220950 - DWB-204: Grove Rd No. 3 Well 02-Feb-2022 9:10 am	<b>Guideline Value</b>	<b>Maximum Acceptable Values (MAV)</b>
<b>Lab Number:</b>		2851574.3	2851574.4		
pH	pH Units	7.6 ± 0.2	7.6 ± 0.2	7.0 - 8.5	-
Electrical Conductivity (EC)	mS/m	13.7 ± 0.3	13.5 ± 0.3	-	-
Total Iron	g/m <sup>3</sup>	< 0.021 ± 0.014	< 0.021 ± 0.014	< 0.2	-
Total Manganese	g/m <sup>3</sup>	< 0.00053 ± 0.00036	< 0.00053 ± 0.00036	< 0.04 (Staining) < 0.10 (Taste)	0.4
Bromide	g/m <sup>3</sup>	< 0.05 ± 0.041	< 0.05 ± 0.041	-	-
Chloride	g/m <sup>3</sup>	6.29 ± 0.45	6.18 ± 0.45	< 250	-
Nitrite-N	g/m <sup>3</sup>	< 0.002 ± 0.0014	< 0.002 ± 0.0014	-	0.06 0.91 (short term)
Nitrite	g/m <sup>3</sup>	< 0.007	< 0.007	-	0.2 3 (short term)
Nitrate-N	g/m <sup>3</sup>	1.10 ± 0.14	1.09 ± 0.14	-	11.3
Nitrate-N + Nitrite-N	g/m <sup>3</sup>	1.10 ± 0.14	1.09 ± 0.14	-	-
Nitrate	g/m <sup>3</sup>	4.86 ± 0.59	4.81 ± 0.58	-	50
Total Organic Carbon (TOC)	g/m <sup>3</sup>	0.7 ± 2.5	1.5 ± 2.9	-	-



**Sample Type: Drinking Water for DWSNZ Compliance**

<b>Sample Name:</b>		20220951 - DWB-205: Grove Rd No. 4 Well 02-Feb-2022 9:20 am	20220952 - DWB-206: Middle Renwick Rd No. 1 Well 02-Feb-2022 10:15 am	<b>Guideline Value</b>	<b>Maximum Acceptable Values (MAV)</b>
<b>Lab Number:</b>		2851574.5	2851574.6		
pH	pH Units	7.6 ± 0.2	7.5 ± 0.2	7.0 - 8.5	-
Electrical Conductivity (EC)	mS/m	13.5 ± 0.3	13.3 ± 0.3	-	-
Total Iron	g/m <sup>3</sup>	< 0.021 ± 0.014	< 0.021 ± 0.014	< 0.2	-
Total Manganese	g/m <sup>3</sup>	< 0.00053 ± 0.00036	< 0.00053 ± 0.00036	< 0.04 (Staining) < 0.10 (Taste)	0.4
Bromide	g/m <sup>3</sup>	< 0.05 ± 0.041	< 0.05 ± 0.041	-	-
Chloride	g/m <sup>3</sup>	6.24 ± 0.45	5.02 ± 0.41	< 250	-
Nitrite-N	g/m <sup>3</sup>	< 0.002 ± 0.0014	< 0.002 ± 0.0014	-	0.06 0.91 (short term)
Nitrite	g/m <sup>3</sup>	< 0.007	< 0.007	-	0.2 3 (short term)
Nitrate-N	g/m <sup>3</sup>	1.09 ± 0.14	0.813 ± 0.098	-	11.3
Nitrate-N + Nitrite-N	g/m <sup>3</sup>	1.09 ± 0.14	0.813 ± 0.098	-	-
Nitrate	g/m <sup>3</sup>	4.84 ± 0.59	3.60 ± 0.44	-	50
Total Organic Carbon (TOC)	g/m <sup>3</sup>	0.6 ± 2.7	1.8 ± 2.6	-	-

**Sample Type: Drinking Water for DWSNZ Compliance**

Sample Name:		20220953 - DWB-207: Middle Renwick Rd No. 2 Well 02-Feb-2022 10:30 am	20220954 - DWB-208: Middle Renwick Rd No. 3 Well 02-Feb-2022 10:45 am	Guideline Value	Maximum Acceptable Values (MAV)
Lab Number:		2851574.7	2851574.8		
pH	pH Units	7.6 ± 0.2	7.6 ± 0.2	7.0 - 8.5	-
Electrical Conductivity (EC)	mS/m	13.4 ± 0.3	13.3 ± 0.3	-	-
Total Iron	g/m <sup>3</sup>	< 0.021 ± 0.014	< 0.021 ± 0.014	< 0.2	-
Total Manganese	g/m <sup>3</sup>	< 0.00053 ± 0.00036	< 0.00053 ± 0.00036	< 0.04 (Staining) < 0.10 (Taste)	0.4
Bromide	g/m <sup>3</sup>	< 0.05 ± 0.041	< 0.05 ± 0.041	-	-
Chloride	g/m <sup>3</sup>	5.00 ± 0.41	4.97 ± 0.41	< 250	-
Nitrite-N	g/m <sup>3</sup>	< 0.002 ± 0.0014	< 0.002 ± 0.0014	-	0.06 0.91 (short term)
Nitrite	g/m <sup>3</sup>	< 0.007	< 0.007	-	0.2 3 (short term)
Nitrate-N	g/m <sup>3</sup>	0.790 ± 0.095	0.824 ± 0.099	-	11.3
Nitrate-N + Nitrite-N	g/m <sup>3</sup>	0.790 ± 0.095	0.824 ± 0.099	-	-
Nitrate	g/m <sup>3</sup>	3.50 ± 0.43	3.65 ± 0.44	-	50
Total Organic Carbon (TOC)	g/m <sup>3</sup>	1.0 ± 2.6	1.0 ± 2.7	-	-

**Note:** The Guideline Values and Maximum Acceptable Values (MAV) are taken from the publication 'Drinking-water Standards for New Zealand 2005 (Revised 2018)', Ministry of Health. Copies of this publication are available from <https://www.health.govt.nz/publication/drinking-water-standards-new-zealand-2005-revised-2018>

The Maximum Acceptable Values (MAVs) have been defined by the Ministry of Health for parameters of health significance and should not be exceeded. The Guideline Values are the limits for aesthetic determinands that, if exceeded, may render the water unattractive to consumers.

**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 New Zealand Drinking Water Standards 2005 (Revised 2018)) that indicates any non-compliance (transgression) with the Maximum Acceptable Values (MAVs) to Taumata Arowai, the water services regulator for Aotearoa.**

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](http://www.hill-laboratories.com/files/Intro_To_UOM.pdf), or contact the laboratory.

Note that the units g/m<sup>3</sup> are the same as mg/L and ppm.

**Analyst's Comments**

**Samples 1, 3, 5 Comment:**

Please note that the level of Uncertainty of Measurement (UOM) for the TOC result is significantly greater than that usually reported for this analyte (>300% at the 95% confidence level).

**Samples 2, 7-8 Comment:**

Please note that the level of Uncertainty of Measurement (UOM) for the TOC result is significantly greater than that usually reported for this analyte (up to 200-300% at the 95% confidence level).

**Samples 4, 6 Comment:**

Please note that the level of Uncertainty of Measurement (UOM) for the TOC result is significantly greater than that usually reported for this analyte (up to 100-200% at the 95% confidence level).

**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 Laboratories, 28 Duke Street, Frankton, Hamilton 3204.

**Sample Type: Drinking Water for DWSNZ Compliance**

Test	Method Description	Default Detection Limit	Sample No
Filtration, Unpreserved	Sample filtration through 0.45µm membrane filter. Performed at Hill Laboratories - Chemistry; 101c Waterloo Road, Christchurch.	-	1-8
Total Digestion	Nitric acid digestion. APHA 3030 E (modified) 23 <sup>rd</sup> ed. 2017.	-	1-8

Sample Type: Drinking Water for DWSNZ Compliance			
Test	Method Description	Default Detection Limit	Sample No
pH	pH meter. Analysed at Hill Laboratories - Chemistry; 101c Waterloo Road, Christchurch. APHA 4500-H <sup>+</sup> B 23 <sup>rd</sup> ed. 2017. 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	1-8
Electrical Conductivity (EC)	Conductivity meter, 25°C. Analysed at Hill Laboratories - Chemistry; 101c Waterloo Road, Christchurch. APHA 2510 B 23 <sup>rd</sup> ed. 2017.	0.1 mS/m	1-8
Total Iron	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 <sup>rd</sup> ed. 2017.	0.021 g/m <sup>3</sup>	1-8
Total Manganese	Nitric acid digestion, ICP-MS, trace level. APHA 3125 B 23 <sup>rd</sup> ed. 2017 / US EPA 200.8.	0.00053 g/m <sup>3</sup>	1-8
Bromide	Filtered sample from Christchurch. Ion Chromatography. APHA 4110 B (modified) 23 <sup>rd</sup> ed. 2017.	0.05 g/m <sup>3</sup>	1-8
Chloride	Filtered sample from Christchurch. Ion Chromatography. APHA 4110 B (modified) 23 <sup>rd</sup> ed. 2017.	0.5 g/m <sup>3</sup>	1-8
Nitrite-N	Filtered sample from Christchurch. Automated Azo dye colorimetry, Flow injection analyser. APHA 4500-NO <sub>2</sub> <sup>-</sup> I (modified) 23 <sup>rd</sup> ed. 2017.	0.002 g/m <sup>3</sup>	1-8
Nitrite	Calculation from Nitrite-N.	0.004 g/m <sup>3</sup>	1-8
Nitrate-N	Calculation: (Nitrate-N + Nitrite-N) - NO <sub>2</sub> N. In-House.	0.0010 g/m <sup>3</sup>	1-8
Nitrate-N + Nitrite-N	Filtered sample from Christchurch. Total oxidised nitrogen. Automated cadmium reduction, flow injection analyser. APHA 4500-NO <sub>3</sub> <sup>-</sup> I (modified) 23 <sup>rd</sup> ed. 2017.	0.002 g/m <sup>3</sup>	1-8
Nitrate	Calculation from Nitrate-N.	0.005 g/m <sup>3</sup>	1-8
Total Organic Carbon (TOC)	Supercritical persulphate oxidation, IR detection, for Total C. Acidification, purging for Total Inorganic C. TOC = TC - TIC. The uncertainty of the calculated result is a combination of the uncertainties of the two analytical determinands in the subtraction calculation. Where both determinands are similar in magnitude, the calculated result has a significantly higher uncertainty than would normally be achieved if one of the results was significantly less than the other. In such cases, the elevated uncertainty should be kept in mind when interpreting the data. APHA 5310 C (modified) 23 <sup>rd</sup> ed. 2017.	0.5 g/m <sup>3</sup>	1-8

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

Testing was completed between 04-Feb-2022 and 11-Feb-2022. 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.

Ara Heron BSc (Tech)  
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