Analytical Research Laboratories

890 Waitangi Road,
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Phone: 0800 100 668
Fax: (06) 835 9223
Email: arl@arllab.co.nz
Website: www.arllab.co.nz

Customer:	V E MOON			**Customer No:**	60884192
	45 NAPIER STREET			**Samples Received:**	11/11/2020 12:05
	JERVOISTOWN			**Report Issued:**	12/11/2020
				Total samples:	1
	NAPIER 4112	**Service Person:**	Customer Centre	**Order Number:**	Moon
		Name:			
Supplier ID:	-	**Email:**	vanessa@staples-moon.com		

60884192-Moon

WATER ANALYSIS REPORT - DRINKING WATER

Water Type: Drinking Water - Untreated	**Supply Code: -**	**Source Code:**	-
Sample Name: V. Moon	**Lab Number: 1959117**	**Temp on receipt oC:**	18.5
Date & Time Sampled:	11/11/2020 11:00	**Temp when sampled oC: -**	

Nutrient	Result	Uncertainty of measurement +/-
Total Coliforms MPN/100 mL	<1	-
E. coli MPN/100 mL	<1	-

Analysis comment:

Natalia Domagala, for ARL

IANZ ACCREDITED LABORATORY

Tests indicated as not accredited are outside the scope of the laboratory's accreditation.

Relevant test methods, and their statistical information, are available upon request. Results apply to the sample(s) as received. The units of mg/L are equivalent to g/m3.

To be valid for compliance testing, samples must not be frozen and must arrive at the laboratory at a temperature not higher than 10°C or not higher than the original temperature at point of sampling.

See final page for method summary and detection limits.

KEY

- Tests not Accredited
- Tests subcontracted
- Failed NZDWS

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COMMENTS: **Reference - Drinking Water Standards for NZ (2005, Revised 2018). Guidelines for Drinking Water Quality (WHO; 4th Edition (2011))``**

BACTERIA Total Coliforms - Total Coliforms is a generic term to describe a group of bacteria present all around us, most of which are not dangerous to human health. Total coliforms include bacteria that are found in the soil, in water that has been influenced by surface water, and in human or animal waste. However, these bacteria are not naturally present in groundwater and are an indication of general environmental contamination of the supply. A positive test for coliform bacteria can be a reasonable indication for the presence of other pathogenic bacteria.

Escherichia Coli (*E. coli*) - Unlike other bacteria that comprise the total coliform group of organisims, *E. coli* is generally not found growing and reproducing in the environment. **Consequently, *E. coli* is considered to be a species within the Coliform group that is the best indicator of recent faecal pollution** and the potential for the presence of more dangerous disease causing organisims (or pathogens).

If *E. coli* is present in your water sample, it is strongly advisable that you find an alternative drinking supply until you have eliminated them by treating the water. In the short term, an alternative to treatment is to use bottled water. Contact a local water reticulation engineer for treatment options.

pH - The generally acceptable range for drinking water is between pH 6.5 to 8.5. The pH is the measurement of the water's acidity or alkalinity. Levels below 6.5 may be corrosive, while levels above 8.5 may create scaling problems and impart a bitter taste.

CALCIUM - The recommended limit is 200 mg/L. Excessive calcium may contribute to the formation of kidney or bladder stones. Calcium also contributes to the hardness of water and may cause problems with laundering, washing and bathing. Because calcium is the major contributor to water hardness, consult the comments for Total Hardness.

MAGNESIUM - The recommended limit is 150 mg/L. Magnesium is another element that contributes to the hardness and taste of water. Excessive magnesium may impart a bitter taste, but is normally not a health hazard. Water softeners will reduce the level of both calcium and magnesium in the water.

POTASSIUM - The recommended limit is 20 mg/L. Levels above 100 mg/L may cause a laxative effect, while levels above 340 mg/L may affect taste.

SODIUM- Over 200 mg/L is considered high and may cause corrosion of the water supply system particularly if the water is warm and alkaline. At this level it may also impart a salty taste. Healthy people drinking water with levels of 200 mg/L or less will cause no harm, however for people on salt-restricted diets or those suffering from hypertension, congestive heart failure or heart disease, the recommended limit is 20 mg/L. Consult your Doctor or use an alternative supply for drinking.

Note: Water softening devices usually increase sodium concentration, while reverse osmosis and distillation units will reduce it.

COPPER - Recommended limit is 2 mg/L. Copper usually arises from the corrosive action of water by leaching the copper pipelines. Concentrations above 1 mg/L may cause staining of sanitary ware and laundry. Concentrations above 5 mg/L can impart and colour and bitter taste to the water.

MANGANESE - The Drinking Water Standards specifies a limit of 0.4mg/L ATO; (appearance, taste and odour), but has no health limit. The World Health Organisation specifies a limit of 0.5mg/L.

IRON - The recommended limit is 0.3 mg/L. Excessive iron is a nuisance, resulting in the staining (red through brown) of laundry, bathroom fixtures, crockery and clothing. It may also cause undesirable taste in beverages. If left to stand, water from the tap containing high iron levels can result in a red/brown sediment. Reticulated waters with high iron levels can encourage the growth of iron bacteria causing blockages. Iron in drinking water is not a health concern unless at extreme levels. Iron removal units will reduce iron concentrations.

CONDUCTIVITY - Most drinking waters have conductivity measurements below 200 mS/m. The conductivity of water is used to calculate the concentration of dissolved solids.

TOTAL DISSOLVED SOLIDS - Levels less than 500 mg/L are considered good. Total dissolved solids indicate the amount of chemical substances dissolved in the water. At increasing levels, palatability decreases. Levels in excess of 1000 mg/L may produce a bad taste.

TOTAL ALKALINITY - The acceptable limit is 500 mg/L. Excessive alkalinity may cause stomach upset and encrustation of utensils, pipes, and inside water heaters. High levels can also impart a 'flat' taste to the water and cause "itchy" skin when bathing.

CHLORIDE - The recommended limit is 250 mg/L. Excessive chlorides give the water a "salty" taste, usually noticeable at about 350 mg/L.

HARDNESS - The most desirable range of total hardness is between 80 and 100 mg/L. Total hardness is a term describing the accumulation of dissolved calcium and magnesium (largely as carbonates), and other minerals as it "percolates" through the earth. Total hardness less than 80 mg/L may result in corrosive water, while hardness above 100 mg/L may result in the need for more soap during bathing and laundering. Excessive hardness may also lead to scale deposits in pipes, heaters, and boilers. Water softeners will reduce hardness to acceptable levels, but will result in increased sodium concentrations (see Sodium.) Hardness values exceeding 500 mg/L are generally unsuitable for domestic purposes without treatment.

BICARBONATE - The recommended limit is 1000 mg/L. High levels of bicarbonate can result in a fine white suspension (sodium bicarbonate.) Excessive bicarbonates contribute to the production of scale inside water heaters and hot water jugs.

NITRATE AND NITRITE NITROGEN (NO_3 + NO_2 - N) - The recommended limit is 11.4 mg/L. If these limits are exceeded, excessive fertiliser use, human and/or animal waste contamination should be suspected and an investigation carried out to determine the source. The concentration nitrite and nitrate above the recommended limit (expressed as nitrogen) is potentially dangerous for bottle fed infants because of its ability to cause Methaemoglobinaemia or "Blue Baby Syndrome" in which the blood loses its ability to carry sufficient oxygen. In the event that you have high nitrate/nitrite in your water it is important to find an alternative source for making infant formulas. It is important to note that nitrate and nitrite concentrations cannot be reduced by water softeners or boiling.

LANGELIER'S SATURATION INDEX (LSI) - A measure of waters ability to form or remove a calcium carbonate scale on surfaces. Desired measure is between -0.5 and 0.5. Above 0.5 - scale forming, can cause issues concerning water flow and quality. Below -0.5 Not scale forming. Possible corrosion.

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Drinking Water Methods Summary

The following table, as required by the Drinking-Water Standards New Zealand (Section 8.3.6), provides a brief description of the methods, and their reporting limits, used in analysis of the Drinking Water sample(s), as supplied.

A 'Reporting Limit' is a figure, which represents the lowest result to which the laboratory is confident to report to. Taking into account the sample supplied, the instrument sensitivity and the uncertainty of measurement for each analysis. Reporting Limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that additional dilutions are performed during the analysis.

Test	Method Description	Reporting Limit
Escherichia coli (E.coli)	Using Colilert 18 Test Kit system	1 MPN/100mL
Total Coliforms		1 MPN/100mL
pH	Using a calibrated pH meter	N/A
Calcium	In-house, based upon the US EPA 200.2 extraction and US EPA 200.8 analysis (ICP-MS)	0.1 mg/L
Magnesium		0.1 mg/L
Potassium		0.1 mg/L
Sodium		0.1 mg/L
Zinc		0.01 mg/L
Manganese		0.01 mg/L
Iron		0.01 mg/L
Boron		0.1 mg/L
Copper		0.01 mg/L
Conductivity	Using a calibrated conductivity meter	1 mS/m
Total Dissolved Solids (TDS)	Calculation based upon Conductivity	10 mg/L
Alkalinity	Titration with hydrochloric acid	5 mg/L
Chloride	Potentiometric titration / ISE	2 mg/L
Hardness (as CaCO3)	Calculation based upon Ca and Mg concentration	5 mg/L
Bicarbonate (as CACO3)	Calculation based upon Alkalinity	0.1 me/L
Free carbon dioxide	Titration with sodium hydroxide	5 mg/L
Nitrate-N*	Reduction to nitrite via cadmium column, with analysis on Flow Injection Analyser (FIA)	0.02 mg/L
Nitrite-N*		0.02 mg/L
Ammoniacal-N*	Berthelot reaction, with analysis on FIA	0.02 mg/L
Antimony	In-house, based upon the US EPA 200.2 extraction and US EPA 200.8 analysis (ICP-MS)	0.004 mg/L
Aluminium		0.02 mg/L
Arsenic		0.002 mg/L
Barium		0.14 mg/L
Cadmium		0.0008 mg/L
Chromium		0.01 mg/L
Lead		0.002 mg/L
Mercury		0.0014 mg/L
Molybdenum		0.014 mg/L
Nickel		0.016 mg/L
Selenium		0.002 mg/L
Uranium		0.004 mg/L

* Results stated as 'nitrogen component', NOT as nitrate, nitrite or ammonia.