

### Certificate of Analysis

#### Laboratory Reference: 180516-016

**Attention:** Hilltop Sampler  
**Client:** GISBORNE DISTRICT COUNCIL  
**Address:** PO Box 747, Gisborne, 4040  
**Client Reference:** Annual Chemistry Screening - Campion Venturi  
**Purchase Order:** WWK06 ADM 2123

**Final Report:** 271235-0  
**Report Issue Date:** 22-May-2018  
**Received Date:** 15-May-2018  
**Sampled By:** Kathryn Sharman  
**Quote Reference :** 5876

#### Sample Details

#### WATERS

**Lab Sample ID:** 180516-016-1  
**Client Sample ID:** N/A  
**Sample Date/Time:** 14/05/2018 13:05  
**Description:** Campion College  
Venturi - WRS

#### Chemistry Detailed

##### Anions by Ion Chromatography (0.45 µm Filtered)

Bromate	mg/L	<0.005
Bromide	mg/L	<0.01
Chlorate	mg/L	<0.01
Chloride	mg/L	12
Chlorite	mg/L	<0.005
Nitrate (as N)	mg/L	0.025
Nitrite (as N)	mg/L	<0.002
Sulphate	mg/L	3.1
Total Oxidised Nitrogen (as N) by Calculation	mg/L	0.025 *

#### Sample Parameters and Field Testing

##### Temperature

Temperature	°C	3.5
Time temperature taken		07:20:00 AM

##### General Testing

Ammoniacal Nitrogen (as N)	mg/L	0.0050
Bicarbonate Alkalinity (as HCO <sub>3</sub> )	mg/L	35
Carbonate Alkalinity (as CO <sub>3</sub> )	mg/L	<1.0
Conductivity (at 25 °C)	mS/m	10.6
Dissolved Oxygen	mg/L	9.0
Dissolved Reactive Phosphorus (as P)	mg/L	0.011
Fluoride	mg/L	0.60
Molybdate Reactive Silica (as SiO <sub>2</sub> )	mg/L	10
pH (at room temp c. 20 °C)	pH unit	7.4
Total Alkalinity (as CaCO <sub>3</sub> )	mg/L	29
Total Cyanide	mg/L	<0.005
Turbidity	NTU	0.15
UV Absorption at 254nm	abs units	0.020

#### Metals

##### Total Metals by ICP-MS—Trace (Default Digest)

Aluminium (Total)	mg/L	0.052
Antimony (Total)	mg/L	<0.001
Arsenic (Total)	mg/L	0.00020
Barium (Total)	mg/L	0.0062
Beryllium (Total)	mg/L	<0.00005
Boron (Total)	mg/L	0.019
Cadmium (Total)	mg/L	<0.00005
Calcium (Total)	mg/L	11
Chromium (Total)	mg/L	<0.0005
Copper (Total)	mg/L	0.00044
Iron (Total)	mg/L	<0.002
Lead (Total)	mg/L	<0.0001

Sample Details (continued)		WATERS	
Lab Sample ID:		180516-016-1	
Client Sample ID:		N/A	
Sample Date/Time:		14/05/2018 13:05	
Description:		Campion College Venturi - WRS	

### Metals

#### Total Metals by ICP-MS—Trace (Default Digest)

Lithium (Total)	mg/L	0.0020
Magnesium (Total)	mg/L	1.1
Manganese (Total)	mg/L	0.00077
Mercury (Total)	mg/L	<0.00005
Molybdenum (Total)	mg/L	<0.0003
Nickel (Total)	mg/L	<0.0001
Potassium (Total)	mg/L	0.68
Selenium (Total)	mg/L	<0.0005
Silver (Total)	mg/L	<0.0002
Sodium (Total)	mg/L	6.5
Tin (Total)	mg/L	<0.0001
Total Hardness (as CaCO3)	mg/L	31
Uranium (Total)	mg/L	<0.00001
Zinc (Total)	mg/L	<0.001

Results marked with \* are not accredited to International Accreditation New Zealand

Where samples have been supplied by the client they are tested as received. A dash indicates no test performed.

### Reference Methods

The sample(s) referred to in this report were analysed by the following method(s)

Analyte	Method Reference	MDL	Samples	Location
<b>Chemistry Detailed</b>				
<b>Anions by Ion Chromatography (0.45 µm Filtered)</b>				
Bromate	In House based on APHA (online edition) 4110 B and EPA 300.0	0.005 mg/L	All	Auckland
Bromide	In House based on APHA (online edition) 4110 B and EPA 300.0	0.010 mg/L	All	Auckland
Chlorate	In House based on APHA (online edition) 4110 B and EPA 300.0	0.010 mg/L	All	Auckland
Chloride	In House based on APHA (online edition) 4110 B and EPA 300.0	0.02 mg/L	All	Auckland
Chlorite	In House based on APHA (online edition) 4110 B and EPA 300.0	0.005 mg/L	All	Auckland
Nitrate (as N)	In House based on APHA (online edition) 4110 B and EPA 300.0	0.002 mg/L	All	Auckland
Nitrite (as N)	In House based on APHA (online edition) 4110 B and EPA 300.0	0.002 mg/L	All	Auckland
Sulphate	In House based on APHA (online edition) 4110 B and EPA 300.0	0.02 mg/L	All	Auckland
Total Oxidised Nitrogen (as N) by Calculation	In House based on APHA (online edition) 4110 B and EPA 300.0	0.002 mg/L	All	Auckland

### Sample Parameters and Field Testing

<b>Temperature</b>				
Temperature	APHA (online edition) 2550 B		All	Auckland
Time temperature taken	APHA (online edition) 2550 B		All	Auckland

### General Testing

Ammoniacal Nitrogen (as N) by Colorimetry/Discrete Analyser	HMSO (1981) ISBN 0117516139	0.005 mg/L	All	Auckland
Bicarbonate Alkalinity (as HCO <sub>3</sub> ) by Titration	APHA (online edition) 2320 B	1 mg/L	All	Auckland
Carbonate Alkalinity (as CO <sub>3</sub> ) by Titration	APHA (online edition) 2320 B	1 mg/L	All	Auckland
Conductivity (at 25 °C) by Electrode	APHA (online edition) 2510 B	0.5 mS/m	All	Auckland
Dissolved Oxygen by Titration	APHA (online edition) 4500-O C	0.05 mg/L	All	Auckland
Dissolved Reactive Phosphorus (as P) by Colorimetry/Discrete Analyser	APHA (online edition) 4500-P F	0.002 mg/L	All	Auckland
Fluoride by Ion-Selective Electrode/Flow Analysis (0.45 µm Filtered)	APHA (online edition) 4500-F G	0.02 mg/L	All	Auckland
Molybdate Reactive Silica (as SiO <sub>2</sub> ) by Colorimetry/Discrete Analyser	APHA (online edition) 4500-SiO <sub>2</sub> F (modified)	1 mg/L	All	Auckland
pH (at room temp c. 20 °C) by Electrode	APHA (online edition) 4500-H B	0.1 pH unit	All	Auckland
Total Alkalinity (as CaCO <sub>3</sub> ) by Titration	APHA (online edition) 2320 B	1 mg/L	All	Auckland
Total Cyanide by Distillation and Colorimetry/Discrete Analyser	APHA (online edition) 4500-CN C & E (modified)	0.005 mg/L	All	Auckland
Turbidity by Nephelometry	USEPA 180.1	0.05 NTU	All	Auckland
UV Absorption at 254nm by Spectrophotometry	In House method	0.002 abs units	All	Auckland

## Metals

### Total Metals by ICP-MS—Trace (Default Digest)

Aluminium (Total)	APHA (online edition) 3125 B by ICPMS	0.005 mg/L	All	Auckland
Antimony (Total)	APHA (online edition) 3125 B by ICPMS	0.001 mg/L	All	Auckland
Arsenic (Total)	APHA (online edition) 3125 B by ICPMS	0.00010 mg/L	All	Auckland
Barium (Total)	APHA (online edition) 3125 B by ICPMS	0.0002 mg/L	All	Auckland
Beryllium (Total)	APHA (online edition) 3125 B by ICPMS	0.00005 mg/L	All	Auckland
Boron (Total)	APHA (online edition) 3125 B by ICPMS	0.005 mg/L	All	Auckland
Cadmium (Total)	APHA (online edition) 3125 B by ICPMS	0.00005 mg/L	All	Auckland
Calcium (Total)	APHA (online edition) 3125 B by ICPMS	0.010 mg/L	All	Auckland
Chromium (Total)	APHA (online edition) 3125 B by ICPMS	0.0005 mg/L	All	Auckland
Copper (Total)	APHA (online edition) 3125 B by ICPMS	0.0002 mg/L	All	Auckland
Iron (Total)	APHA (online edition) 3125 B by ICPMS	0.002 mg/L	All	Auckland
Lead (Total)	APHA (online edition) 3125 B by ICPMS	0.00010 mg/L	All	Auckland
Lithium (Total)	APHA (online edition) 3125 B by ICPMS	0.0003 mg/L	All	Auckland
Magnesium (Total)	APHA (online edition) 3125 B by ICPMS	0.001 mg/L	All	Auckland
Manganese (Total)	APHA (online edition) 3125 B by ICPMS	0.0005 mg/L	All	Auckland
Mercury (Total)	APHA (online edition) 3125 B by ICPMS	0.00005 mg/L	All	Auckland
Molybdenum (Total)	APHA (online edition) 3125 B by ICPMS	0.0003 mg/L	All	Auckland
Nickel (Total)	APHA (online edition) 3125 B by ICPMS	0.00010 mg/L	All	Auckland
Potassium (Total)	APHA (online edition) 3125 B by ICPMS	0.05 mg/L	All	Auckland
Selenium (Total)	APHA (online edition) 3125 B by ICPMS	0.0005 mg/L	All	Auckland
Silver (Total)	APHA (online edition) 3125 B by ICPMS	0.0002 mg/L	All	Auckland
Sodium (Total)	APHA (online edition) 3125 B by ICPMS	0.1 mg/L	All	Auckland
Tin (Total)	APHA (online edition) 3125 B by ICPMS	0.00010 mg/L	All	Auckland
Total Hardness (as CaCO <sub>3</sub> )	APHA (online edition) 3125 B by ICPMS	0.03 mg/L	All	Auckland
Uranium (Total)	APHA (online edition) 3125 B by ICPMS	0.000010 mg/L	All	Auckland
Zinc (Total)	APHA (online edition) 3125 B by ICPMS	0.001 mg/L	All	Auckland

## Preparations

Digest for Total Metals in Liquids	APHA (online edition) 3030 E (modified, 4:1 Nitric:Hydrochloric Acid)	All	Auckland
Membrane Filtration (0.45 µm)	APHA (online edition) 4500-P B (preliminary filtration)	All	Auckland

*The method detection limit (MDL) listed is the limit attainable in a relatively clean matrix. If dilutions are required for analysis the detection limit may be higher. For more information please contact the Operations Manager.*

Samples, with suitable preservation and stability of analytes, will be held by the laboratory for a period of two weeks after results have been reported, unless otherwise advised by the submitter.

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Report Signatory 22/05/2018

A handwritten signature in blue ink, appearing to read 'Zum Nguyen'.

Zum Nguyen  
KTP Signatory