Hill Laboratories
TRIED, TESTED AND TRUSTED

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Certificate of Analysis

Client:	Hawkes Bay Regional Council	**Lab No:**	2836331 SPv1
Contact:	Ariana Mackay C/- Hawkes Bay Regional Council Private Bag 6006 Napier 4142	**Date Received:**	22-Jan-2022
		Date Reported:	02-Feb-2022
		Quote No:	105684
		Order No:	PN00001167
		Client Reference:	Whangawehi (Jan.)
		Add. Client Ref:	102312
		Submitted By:	Ariana Mackay

Sample Type: Aqueous

Sample Name:		85311 - Whangawehi Strm at Pat O'Brians-3304 21-Jan-2022	85312 - Mangatupae Strm at Pat O'Brians-3303 21-Jan-2022	85313 - Whangawehi at George Ormonds -3301 21-Jan-2022		
Lab Number:		2836331.1	2836331.2	2836331.3		
Faecal Coliforms and E. coli profile						
Faecal Coliforms	cfu / 100mL	15,000 #1	550 #2	80 #3	-	-
Escherichia coli	cfu / 100mL	10,000 #1	510 #2	80 #3	-	-
HBRC Standard River						
Turbidity ISO	FNU	1.42	0.92	0.56	-	-
pH	pH Units	7.9	8.1	7.8	-	-
Electrical Conductivity (EC)	µS/cm	525	555	535	-	-
Volatile Suspended Solids	g/m³	< 0.5	1.4	1.3	-	-
Total Suspended Solids	g/m³	2.7	2.1	2.7	-	-
Total Nitrogen	g/m³	0.22	0.11	0.24	-	-
Total Ammoniacal-N	g/m³	< 0.005	< 0.005	< 0.005	-	-
Nitrite-N	g/m³	< 0.0010	< 0.0010	< 0.0010	-	-
Nitrate-N	g/m³	< 0.0010	< 0.0010	< 0.0010	-	-
Nitrate-N + Nitrite-N	g/m³	< 0.0010	< 0.0010	< 0.0010	-	-
Total Kjeldahl Nitrogen (TKN)	g/m³	0.22	0.11	0.24	-	-
Dissolved Reactive Phosphorus	g/m³	0.053	0.075	0.051	-	-
Total Phosphorus	g/m³	0.067	0.090	0.074	-	-

Analyst's Comments

#1 Statistically estimated count based on the theoretical countable range for the stated method.
Please interpret this microbiological result with caution as the sample required repeat analysis. Due to incubation times it is not possible to perform a repeat analysis within 24 hours of sampling as required by the method. Repeats are typically due to unexpected analyte levels.
Please interpret this result with caution as the sample was > 10 °C on receipt at the lab. The sample temperature is recommended by the laboratory's reference methods to be less than 10 °C on receipt at the laboratory (but not frozen). However, it is acknowledged that samples that are transported quickly to the laboratory after sampling, may not have been cooled to this temperature.

#2 Please interpret this result with caution as it is not known what the sample age was on receipt at the lab. Please ensure that both sampling date and time are recorded on the submission form and sample bottle. The sample is required to be less than 24 hours at the time of testing in the lab.
Please interpret this result with caution as the sample was > 10 °C on receipt at the lab. The sample temperature is recommended by the laboratory's reference methods to be less than 10 °C on receipt at the laboratory (but not frozen). However, it is acknowledged that samples that are transported quickly to the laboratory after sampling, may not have been cooled to this temperature.

#3 Statistically estimated count based on the theoretical countable range for the stated method.
Please interpret this result with caution as it is not known what the sample age was on receipt at the lab. Please ensure that both sampling date and time are recorded on the submission form and sample bottle. The sample is required to be less than 24 hours at the time of testing in the lab.
Please interpret this result with caution as the sample was > 10 °C on receipt at the lab. The sample temperature is recommended by the laboratory's reference methods to be less than 10 °C on receipt at the laboratory (but not frozen). However, it is acknowledged that samples that are transported quickly to the laboratory after sampling, may not have been cooled to this temperature.

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: Aqueous

Test	Method Description	Default Detection Limit	Sample No
Individual Tests			
Filtration, Unpreserved	Sample filtration through 0.45µm membrane filter.	-	1-3
Turbidity ISO	Analysis using a Hach 2100N IS, Turbidity meter. ISO 7027:1999(E) (modified).	0.05 FNU	1-3
pH	pH meter. APHA 4500-H^+ B 23rd 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	1-3
Electrical Conductivity (EC)	Conductivity meter, 25°C. APHA 2510 B 23rd ed. 2017.	1 µS/cm	1-3
Volatile Suspended Solids	Filtration (GF/C, 1.2 µm). Ashing 550°C, 30 min. Gravimetric. APHA 2540 E (modified) 23rd ed. 2017.	0.5 g/m³	1-3
Total Suspended Solids	Filtration of a 2L sample using Whatman 934 AH, Advantec GC-50 or equivalent filters (nominal pore size 1.2 - 1.5µm), gravimetric determination. APHA 2540 D (modified) 23rd ed. 2017.	0.5 g/m³	1-3
Total Nitrogen	Calculation: TKN + Nitrate-N + Nitrite-N. Please note: The Default Detection Limit of 0.05 g/m³ is only attainable when the TKN has been determined using a trace method utilising duplicate analyses. In cases where the Detection Limit for TKN is 0.10 g/m³, the Default Detection Limit for Total Nitrogen will be 0.11 g/m³. In-house calculation.	0.05 g/m³	1-3
Total Ammoniacal-N Trace	Phenol/hypochlorite colorimetry. Flow injection analyser. (NH4-N = NH4+-N + NH3-N). APHA 4500-NH_3 H 23rd ed. 2017.	0.005 g/m³	1-3
Nitrite-N Trace	Automated Azo dye colorimetry, Flow injection analyser. APHA 4500-NO_3^- I (modified) 23rd ed. 2017.	0.0010 g/m³	1-3
Nitrate-N	Calculation: (Nitrate-N + Nitrite-N) - NO2N. In-House.	0.0010 g/m³	1-3
Nitrate-N + Nitrite-N Trace	Total oxidised nitrogen. Automated cadmium reduction, flow injection analyser. APHA 4500-NO_3^- I (modified) 23rd ed. 2017.	0.0010 g/m³	1-3
Total Kjeldahl Nitrogen (TKN)	Total Kjeldahl digestion, phenol/hypochlorite colorimetry. Discrete Analyser. APHA 4500-N_{org} D (modified) 4500 NH_3 F (modified) 23rd ed. 2017.	0.10 g/m³	1-3
Dissolved Reactive Phosphorus (trace)	Filtered sample. Molybdenum blue colorimetry. Flow injection analyser. APHA 4500-P G 23rd ed. 2017.	0.0010 g/m³	1-3

Sample Type: Aqueous			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Total Phosphorus	Total phosphorus digestion, automated ascorbic acid colorimetry. Flow Injection Analyser. APHA 4500-P H 23rd ed. 2017.	0.002 g/m^3	1-3
HBRC Standard River		-	1-3
Faecal Coliforms and E. coli profile			
Faecal Coliforms	Membrane Filtration, Count on mFC agar, Incubated at 44.5°C for 22 hours, Confirmation. APHA 9222 D 23rd ed. 2017.	1 cfu / 100mL	1-3
Escherichia coli	Membrane filtration, Count on mFC agar, Incubated at 44.5°C for 22 hours, MUG Confirmation. APHA 9222 I 23rd ed. 2017.	1 cfu / 100mL	1-3

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

Testing was completed between 24-Jan-2022 and 02-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.

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