



## Certificate of Analysis

<b>Client:</b>	Hawkes Bay Regional Council	<b>Lab No:</b>	2026488	SPV1
<b>Contact:</b>	Ariana Mackay C/- Hawkes Bay Regional Council Private Bag 6006 Napier 4142	<b>Date Received:</b>	04-Aug-2018	
		<b>Date Reported:</b>	14-Aug-2018	
		<b>Quote No:</b>	78490	
		<b>Order No:</b>	RM32	
		<b>Client Reference:</b>	Whangawehi	
		<b>Add. Client Ref:</b>	312-302	
		<b>Submitted By:</b>	Ariana Mackay	

### Sample Type: Aqueous

Sample Name:	69241 - Whangawehi Strm at Pat O'Brians-3304 03-Aug-2018	69242 - Mangatupae Strm at Pat O'Brians-3303 03-Aug-2018	69243 - Whangawehi at George Ormonds -3301 03-Aug-2018	69244 - Coops - Trib of Whangawehi - 3306 03-Aug-2018	69245 - Reserve Stream - Trib of Whangawehi - 3307 03-Aug-2018
<b>Lab Number:</b>	2026488.1	2026488.2	2026488.3	2026488.4	2026488.5

#### Faecal Coliforms and E. coli profile

Faecal Coliforms	cfu / 100mL	20 #1	50 #1	10 #1	90 #1	50 #1
Escherichia coli	cfu / 100mL	20 #1	40 #1	10 #1	90 #1	40 #1

#### HBRC Standard River

pH	pH Units	8.1	8.1	8.0	8.3	8.1
Volatile Suspended Solids	g/m <sup>3</sup>	< 0.5	< 0.5	0.6	0.8	< 0.5
Total Suspended Solids	g/m <sup>3</sup>	3.0	2.9	2.6	5.2	1.2
Total Nitrogen	g/m <sup>3</sup>	0.51	0.31	0.55	0.49	0.32
Total Ammoniacal-N	g/m <sup>3</sup>	0.017	0.008	0.012	0.011	0.045
Nitrite-N	g/m <sup>3</sup>	0.0060	0.0019	0.0082	0.0083	0.0022
Nitrate-N	g/m <sup>3</sup>	0.27	0.033	0.26	0.34	0.180
Nitrate-N + Nitrite-N	g/m <sup>3</sup>	0.27	0.035	0.27	0.35	0.182
Total Kjeldahl Nitrogen (TKN)	g/m <sup>3</sup>	0.24	0.27	0.29	0.14	0.14
Dissolved Reactive Phosphorus	g/m <sup>3</sup>	0.070	0.027	0.069	0.113	0.057
Total Phosphorus	g/m <sup>3</sup>	0.094	0.040	0.100	0.122	0.080

Sample Name:	69246 - Whangawehi US Reserve Confl - 3308 03-Aug-2018	69247 - Whangawehi DS Cattleyards - 3309 03-Aug-2018			
<b>Lab Number:</b>	2026488.6	2026488.7			

#### Faecal Coliforms and E. coli profile

Faecal Coliforms	cfu / 100mL	150 #1	50 #1	-	-	-
Escherichia coli	cfu / 100mL	140 #1	40 #1	-	-	-

#### HBRC Standard River

pH	pH Units	8.0	7.8	-	-	-
Volatile Suspended Solids	g/m <sup>3</sup>	< 0.5	< 0.5	-	-	-
Total Suspended Solids	g/m <sup>3</sup>	1.9	< 0.5	-	-	-
Total Nitrogen	g/m <sup>3</sup>	0.84	0.33	-	-	-
Total Ammoniacal-N	g/m <sup>3</sup>	0.006	< 0.005	-	-	-
Nitrite-N	g/m <sup>3</sup>	0.0033	0.0012	-	-	-
Nitrate-N	g/m <sup>3</sup>	0.53	0.047	-	-	-
Nitrate-N + Nitrite-N	g/m <sup>3</sup>	0.54	0.048	-	-	-
Total Kjeldahl Nitrogen (TKN)	g/m <sup>3</sup>	0.30	0.28	-	-	-
Dissolved Reactive Phosphorus	g/m <sup>3</sup>	0.055	0.028	-	-	-
Total Phosphorus	g/m <sup>3</sup>	0.070	0.044	-	-	-



## Analyst's Comments

#1 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.

## 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 clean 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.

Sample Type: Aqueous			
Test	Method Description	Default Detection Limit	Sample No
Individual Tests			
Filtration, Unpreserved	Sample filtration through 0.45µm membrane filter.	-	1-7
pH	pH meter. APHA 4500-H+ B 22 <sup>nd</sup> ed. 2012. 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	1-7
Volatile Suspended Solids	Filtration (GF/C, 1.2 µm). Ashing 550°C, 30 min. Gravimetric. APHA 2540 E (modified) 22 <sup>nd</sup> ed. 2012.	0.5 g/m <sup>3</sup>	1-7
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) 22 <sup>nd</sup> ed. 2012.	0.5 g/m <sup>3</sup>	1-7
Total Nitrogen	Calculation: TKN + Nitrate-N + Nitrite-N. Please note: The Default Detection Limit of 0.05 g/m <sup>3</sup> 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/m <sup>3</sup> , the Default Detection Limit for Total Nitrogen will be 0.11 g/m <sup>3</sup> .	0.05 g/m <sup>3</sup>	1-7
Total Ammoniacal-N Trace	Phenol/hypochlorite colorimetry. Flow injection analyser. (NH <sub>4</sub> -N = NH <sub>4</sub> <sup>+</sup> -N + NH <sub>3</sub> -N). APHA 4500-NH <sub>3</sub> H 22 <sup>nd</sup> ed. 2012.	0.005 g/m <sup>3</sup>	1-7
Nitrite-N Trace	Automated Azo dye colorimetry, Flow injection analyser. APHA 4500-NO <sub>2</sub> -I 22 <sup>nd</sup> ed. 2012 (modified).	0.0010 g/m <sup>3</sup>	1-7
Nitrate-N	Calculation: (Nitrate-N + Nitrite-N) - NO <sub>2</sub> N. In-House.	0.0010 g/m <sup>3</sup>	1-7
Nitrate-N + Nitrite-N Trace	Total oxidised nitrogen. Automated cadmium reduction, flow injection analyser. APHA 4500-NO <sub>3</sub> -I 22 <sup>nd</sup> ed. 2012 (modified).	0.0010 g/m <sup>3</sup>	1-7
Total Kjeldahl Nitrogen (TKN)	Total Kjeldahl digestion, phenol/hypochlorite colorimetry. Discrete Analyser. APHA 4500-Norg D. (modified) 4500 NH <sub>3</sub> F (modified) 22 <sup>nd</sup> ed. 2012.	0.10 g/m <sup>3</sup>	1-7
Dissolved Reactive Phosphorus (trace)	Filtered sample. Molybdenum blue colorimetry. Flow injection analyser. APHA 4500-P G 22 <sup>nd</sup> ed. 2012.	0.0010 g/m <sup>3</sup>	1-7
Total Phosphorus	Total phosphorus digestion, ascorbic acid colorimetry. Discrete Analyser. APHA 4500-P B & E (modified from manual analysis) 22 <sup>nd</sup> ed. 2012. Also modified to include the use of a reductant to eliminate interference from arsenic present in the sample. NAWASCO, Water & soil Miscellaneous Publication No. 38, 1982.	0.004 g/m <sup>3</sup>	1-7
HBRC Standard River		-	1-7
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, 22 <sup>nd</sup> ed. 2012.	1 cfu / 100mL	1-7
Escherichia coli	Membrane filtration, Count on mFC agar, Incubated at 44.5°C for 22 hours, MUG Confirmation. APHA 9222 G, 22 <sup>nd</sup> ed. 2012.	1 cfu / 100mL	1-7

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

Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

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Ara Heron BSc (Tech)  
Client Services Manager - Environmental