



ANALYSIS REPORT

Page 1 of 2

| | | | | |
|-----------------|---------------------------------|--------------------------|-------------|------|
| Client: | Hawkes Bay Regional Council | Lab No: | 1745086 | SPV1 |
| Contact: | V Lyon | Date Received: | 23-Mar-2017 | |
| | C/- Hawkes Bay Regional Council | Date Reported: | 06-Apr-2017 | |
| | Private Bag 6006 | Quote No: | 78490 | |
| | Napier 4142 | Order No: | N46880 | |
| | | Client Reference: | Whangawehi | |
| | | Add. Client Ref: | 312-302 | |
| | | Submitted By: | V Lyon | |

Sample Type: Aqueous

| Sample Name: | 69979 - Whangawehi Strm at Pat O'Brians-3304 22-Mar-2017 10:00 am | 69980 - Mangatupae Strm at Pat O'Brians-3303 22-Mar-2017 10:15 am | 69981 - Whangawehi at George Ormonds -3301 22-Mar-2017 11:15 am | 69982 - Coops - Trib of Whangawehi - 3306 22-Mar-2017 12:00 pm | 69983 - Reserve Stream - Trib of Whangawehi - 3307 22-Mar-2017 12:30 pm |
|--------------|--|--|--|---|--|
| Lab Number: | 1745086.1 | 1745086.2 | 1745086.3 | 1745086.4 | 1745086.5 |

Individual Tests

| | | | | | | |
|-------------------------------|------------------|----------|----------|----------|----------|--------|
| Escherichia coli | cfu / 100mL | 40 | 80 #2 | 70 #2 | 100 #2 | 130 #2 |
| HBRC Standard River | | | | | | |
| Volatile Suspended Solids | g/m ³ | 0.6 | 0.6 | 0.8 | 1.0 #1 | 1.0 |
| Total Suspended Solids | g/m ³ | 1.4 | 1.0 | 1.0 | 0.9 #1 | 2.5 |
| Total Nitrogen | g/m ³ | 0.20 | 0.17 | 0.19 | 0.14 | 0.37 |
| Total Ammoniacal-N | g/m ³ | < 0.005 | < 0.005 | < 0.005 | < 0.005 | 0.045 |
| Nitrite-N | g/m ³ | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | 0.0087 |
| Nitrate-N | g/m ³ | 0.0019 | 0.0021 | < 0.0010 | < 0.0010 | 0.124 |
| Nitrate-N + Nitrite-N | g/m ³ | 0.0025 | 0.0026 | < 0.0010 | 0.0013 | 0.133 |
| Total Kjeldahl Nitrogen (TKN) | g/m ³ | 0.20 | 0.17 | 0.19 | 0.13 | 0.24 |
| Dissolved Reactive Phosphorus | g/m ³ | 0.046 | 0.0167 | 0.060 | 0.029 | 0.078 |
| Total Phosphorus | g/m ³ | 0.060 | 0.030 | 0.072 | 0.032 | 0.112 |

| Sample Name: | 69984 - Whangawehi US Reserve Confl - 3308 22-Mar-2017 1:00 pm | | | | |
|--------------|---|--|--|--|--|
| Lab Number: | 1745086.6 | | | | |

Individual Tests

| | | | | | | |
|-------------------------------|------------------|---------|---|---|---|---|
| Escherichia coli | cfu / 100mL | 180 | - | - | - | - |
| HBRC Standard River | | | | | | |
| Volatile Suspended Solids | g/m ³ | 0.6 | - | - | - | - |
| Total Suspended Solids | g/m ³ | 1.3 | - | - | - | - |
| Total Nitrogen | g/m ³ | 0.37 | - | - | - | - |
| Total Ammoniacal-N | g/m ³ | < 0.005 | - | - | - | - |
| Nitrite-N | g/m ³ | 0.0017 | - | - | - | - |
| Nitrate-N | g/m ³ | 0.21 | - | - | - | - |
| Nitrate-N + Nitrite-N | g/m ³ | 0.21 | - | - | - | - |
| Total Kjeldahl Nitrogen (TKN) | g/m ³ | 0.16 | - | - | - | - |
| Dissolved Reactive Phosphorus | g/m ³ | 0.086 | - | - | - | - |
| Total Phosphorus | g/m ³ | 0.092 | - | - | - | - |



Analyst's Comments

Please interpret this result with caution as the sample was > 8 °C on receipt at the lab. The sample temperature is recommended by APHA to be less than 8 °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.

#1 It has been noted that the result for Volatile Suspended Solids was greater than that for Total Suspended Solids, but within the analytical variation of these methods.

#2 Statistically estimated count based on the theoretical countable range for the stated method.

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 |
| HBRC Standard River | | 0.0010 - 0.5 g/m ³ | 1-6 |
| Filtration, Unpreserved | Sample filtration through 0.45µm membrane filter. | - | 1-6 |
| Total Kjeldahl Digestion | Sulphuric acid digestion with copper sulphate catalyst. | - | 1-6 |
| Total Phosphorus Digestion | Acid persulphate digestion. | - | 1-6 |
| Volatile Suspended Solids | Filtration (GF/C, 1.2 µm). Ashing 550°C, 30 min. Gravimetric. APHA 2540 E 22 nd ed. 2012. | 0.5 g/m ³ | 1-6 |
| 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 22 nd ed. 2012. | 0.5 g/m ³ | 1-6 |
| Total Nitrogen | Calculation: TKN + Nitrate-N + Nitrite-N. Please note: The Default Detection Limit of 0.05 g/m ³ 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 ³ , the Default Detection Limit for Total Nitrogen will be 0.11 g/m ³ . | 0.05 g/m ³ | 1-6 |
| Total Ammoniacal-N Trace | Phenol/hypochlorite colorimetry. Flow injection analyser. (NH ₄ -N = NH ₄ ⁺ -N + NH ₃ -N). APHA 4500-NH ₃ H 22 nd ed. 2012. | 0.005 g/m ³ | 1-6 |
| Nitrite-N Trace | Automated Azo dye colorimetry, Flow injection analyser. APHA 4500-NO ₃ -I 22 nd ed. 2012 (modified). | 0.0010 g/m ³ | 1-6 |
| Nitrate-N | Calculation: (Nitrate-N + Nitrite-N) - NO ₂ N. In-House. | 0.0010 g/m ³ | 1-6 |
| Nitrate-N + Nitrite-N Trace | Total oxidised nitrogen. Automated cadmium reduction, flow injection analyser. APHA 4500-NO ₃ -I 22 nd ed. 2012 (modified). | 0.0010 g/m ³ | 1-6 |
| Total Kjeldahl Nitrogen (TKN) | Total Kjeldahl digestion, phenol/hypochlorite colorimetry. Discrete Analyser. APHA 4500-N _{org} D. (modified) 4500 NH ₃ F (modified) 22 nd ed. 2012. | 0.10 g/m ³ | 1-6 |
| Dissolved Reactive Phosphorus (trace) | Filtered sample. Molybdenum blue colorimetry. Flow injection analyser. APHA 4500-P G 22 nd ed. 2012. | 0.0010 g/m ³ | 1-6 |
| Total Phosphorus | Total phosphorus digestion, ascorbic acid colorimetry. Discrete Analyser. APHA 4500-P B & E (modified from manual analysis) 22 nd ed. 2012. Also modified to include the use of a reductant to eliminate interference from arsenic present in the sample. NWASCA, Water & soil Miscellaneous Publication No. 38, 1982. | 0.004 g/m ³ | 1-6 |
| Escherichia coli | Membrane filtration, Count on mFC agar, Incubated at 44.5°C for 22 hours, MUG Confirmation. Analysed at Hill Laboratories - Microbiology; 1 Clow Place, Hamilton. APHA 9222 G, 22 nd ed. 2012. | 1 cfu / 100mL | 1-6 |

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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Carole Rodgers-Carroll BA, NZCS
Client Services Manager - Environmental